EXHIBIT P8

EAST GOSHEN TOWNSHIP
ACT 537 PLAN DOCUMENTS

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES

Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428

Southeast Regional Office

(610) 832-6130
FAX: (610) 832-6259

JUN 30 1995

RECEIVED
JUN 30 1995

Louis Smith
East Goshen Township
1580 Paoli Pike
West Chester, PA 19380

Re: Act 537 Plan Update
East Goshen Township
Chester County

Dear Mr. Smith:

We have completed our review of your municipality's updated official sewage facilities plan entitled East Goshen Township Act 537 Plan Update as prepared by SMC Environmental Services Group, dated December 1992, Revised June 1994. The review was conducted in accordance with the provisions of the Pennsylvania Sewage Facilities Act.

Approval of the plan is hereby granted.

1. Implementation of the on-lot and community sewage system management program

2. Diversion of sewages flows for New Kent Apartments from the Ridley Creek sewage treatment plant to the West Goshen sewage treatment plant.

3. Immediate initiation of further planning in conjunction with West Goshen for the "West Goshen Alternative". A plan of study must be submitted that outlines the study area and proposed plan content and that includes a Task Activity Report or equivalent cost document.

4. Initiation of further planning to evaluate the need for the proposed Line Road Interceptor. A plan of study must be submitted that outlines the study area and proposed plan content and that includes a Task Activity Report or equivalent cost document.

5. Initiation of further planning to evaluate the possible connection of the Bryn Mawr Rehabilitation Hospital tot he Ridley Creek sewage treatment plant. A plan of study must be submitted that outlines the study area and proposed plan content and that includes an Task Activity Report or equivalent cost document.

6. Utilization of new EDU wastewater ratings:

Single family detached dwellings	- 275 gpd
Townshouses	- 225 gpd
Apartments	- 200 gpd

7. Initiation of further planning to further evaluate other alternatives if the "West Goshen Alternative" does not meet East Goshen Township needs. The spray irrigation alternative would have to be evaluated in more detail. A plan of study must be submitted that outlines the study area and proposed plan content and that includes a Task Activity Report or equivalent cost document.

If you have any questions regarding this matter, please feel free to contact me at the above number.

Sincerely,

Joseph A. Feola

Joseph A. Feola
Water Management Program Manager

cc: Chester County Health Department
Chester County Planning Commission
Planning Section
West Goshen Township
SMC Environmental Services Group
Division of Municipal Facilities and Grants
Re 30 (RN)153

AREA CODE 610
692-7171

BOARD OF SUPERVISORS
EAST GOSHEN TOWNSHIP

CHESTER COUNTY
1580 PAOLI PIKE, WEST CHESTER, PA. 19380

CERTIFIED

October 13, 1994

rec'd. at DER on 10/17/94
120 (Keep) 2/17/95

Joseph A. Feola
Department of Environmental Resoureces
Regional Water Quality Manager
Lee Park, Suite 6010
555 North Lane
Conshohocken, Pa 19428

Attention: Charles Rehm, Jr.
Planning, Section Chief

Re: Act 537 Plan Update
East Goshen Township
Chester County, Pennsylvania

Dear Mr. Rehm:

East Goshen Township and SMC Environmental Services Group have completed the Township's 537 Plan Update and enclose three (3) copies with this letter.

You will see that the format is somewhat different than the current format dictates. This plan was 98-99% complete when the Township and SMC were advised of the revised format and checklist. A June 30, 1993 meeting between Glenn Stinson and John Veneziale of your office and Fred Turner, SMC, Sue Fish, and myself resulted in agreement that our plan could be submitted as it was as long as the check list was completed and made reference to the location of the required material. All new material and addenda are shown on the blue and yellow pages; text highlighting indicates 1994 changes.

Please contact this office if you have any questions.

Very truly yours,

Louis F. Smith, Jr.
Township Manager

LFS/skf
enclosures
cc: Frederick J. Turner, A.I.C.P.
Board of Supervisors
Municipal Authority
File

Is your RETURN ADDRESS completed

...tems 1 and/or 2 for additional services.
...items 3, and 4a & b.
...our name and address on the reverse of this form so that we can ...his card to you.
...ach this form to the front of the mailpiece, or on the back if space ...not permit.
Write "Return Receipt Requested" on the mailpiece below the article number.
The Return Receipt will show to whom the article was delivered and the date delivered.

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1. ☐ Addressee's Address
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3. Article Addressed to:

JOSEPH A. FEOLA, D.E.R.
REG. WATER QUAL. MANAGER
LEE PARK, SUITE 6010
555 NORTH LANE
CONSHOHOCKEN, PA 19428

ATTN: CHARLES REHM

4a. Article Number
P875 873 174

4b. Service Type
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☒ Certified ☐ COD
☐ Express Mail ☒ Return Receipt for Merchandise

7. Date of Delivery

5. Signature (Addressee)

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PS Form 3811, December 1991 ☆ U.S.G.P.O.: 1992-307-530 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

ACT 537 PLAN CONTENT AND ENVIRONMENTAL ASSESSMENT CHECKLIST

For specific details covering the ACT 537 Planning Requirements, refer to Chapters 71 and 73 of the Department's Regulations.

A COPY OF THIS COMPLETED CHECKLIST MUST BE INCLUDED WITH YOUR ACT 537 PLAN. THE DEPARTMENT WILL USE THE "DER USE ONLY" COLUMN DURING THE COMPLETENESS EVALUATION OF THE PLAN. THIS COLUMN MAY ALSO BE USED BY THE DEPARTMENT DURING THE PREPLANNING MEETING WITH THE MUNICIPALITY TO IDENTIFY PLANNING ELEMENTS WHICH WILL NOT BE REQUIRED TO BE INCLUDED IN THE PLAN. ALL THE PLANNING ELEMENTS REQUIRED BY THE DEPARTMENT MUST BE ADDRESSED IN YOUR PLAN OR THE PLAN WILL BE RETURNED AS INCOMPLETE. THE PAGE NUMBER OR OTHER REFERENCE MUST BE LISTED IN COLUMN 2 OF THE CHECKLIST PRIOR TO PLAN SUBMITTAL. IF THE MUNICIPALITY DETERMINES THAT ANY ITEMS LISTED IN THIS CHECKLIST DO NOT APPLY, OR CONDITIONS STATED IN A CERTAIN PART OF THIS CHECKLIST DO NOT EXIST IN AN AREA, A COMMENT MUST BE INCLUDED IN COLUMN 2 WHICH STATES THAT THE PARTICULAR CHECKLIST ITEM WILL HAVE NO IMPACT ON THE PLAN OR THAT IT DOES NOT EXIST IN THE PLANNING AREA. WHEN INFORMATION REQUIRED AS PART OF AN OFFICIAL PLAN UPDATE REVISION HAS BEEN DEVELOPED SEPARATELY OR IN A PREVIOUS UPDATE REVISION, INCORPORATE THE INFORMATION BY REFERENCE TO THE PLANNING DOCUMENT AND PAGE. THREE COPIES OF THE COMPLETED PLAN WITH ALL ATTACHMENTS MUST BE SUBMITTED TO THE DEPARTMENT.

Municipality: East Goshen County: Chester

Local Municipal Contact Official: Louis F. Smith, Jr. Township Manager Telephone Number of Official: 610-692-7171

Consultant: SMC Environmental Services Consultant's Telephone Number: 610-265-2700

Consultant's Contact Person: Frederick J. Turner, Vice President

Title of Submission: Act 537 Plan Update-1994 Date Submitted: _____

☐ 3 copies of Plan submitted to the Department (including supporting documentation)

COMPLETENESS CHECKLIST

DER Use Only	Indicate Page #(s) in Plan	Item Required
	A-1 & B-1 to B-7	1. Table of Contents
		2. Plan Summary
	A-2 to A-4	A. Identify the proposed service areas and major problems evaluated in the plan. (Reference-Title 25, § 71.21.a.7.i)
	A-4 to A-6	B. Identify the alternative(s) chosen to solve the problems and serve the areas of need identified in the plan. Also, include any institutional arrangements necessary to implement the chosen alternative(s). (Reference-Title 25, § 71.21.a.7.ii)
	A-6 to A-8	C. Include the cost of implementing the proposed alternative (including the user fees) and the proposed funding method to be used. (Reference-Title 25, § 71.21.a.7.ii)
	A-8	D. Identify the municipal commitments necessary to implement the plan. (Reference-Title 25, § 71.21.a.7.iii)

DER Use Only	Indicate Page #(s) in Plan	Item Required
	A-8	E. Provide a schedule of implementation for the project which identifies the major milestones with dates necessary to accomplish the project to the point of operational status. Other milestones in the project implementation schedule should be indicated as occurring a finite number of days from a major milestone. (Reference-Title 25, § 71.21.a.7.iv)
	A-9	F. Include dates for the future initiation of feasibility evaluations in the project's implementation schedule for areas proposing completion of sewage facilities for planning periods in excess of five years. (Reference-Title 25, § 71.21.b)
	A-9-A	3. Original, signed and sealed Resolution of Adoption by the Municipality which contains, at a minimum, alternatives chosen and a commitment to implement plan as stated in the implementation schedule. (Reference-Title 25, § 71.31.f) Section V.F of Guidance.
	A-9 to A-12	4. Evidence that the municipality has requested, reviewed, and considered comments by appropriate official: planning agencies of the municipality, planning agencies of the county, planning agencies with areawide jurisdiction (where applicable), and existing county or joint county departments of health. (Reference-Title 25, § 71.31.b) Section V.E.1. of guidance.
	A-12-A	5. Proof of Public Notice which documents proposed plan adoption, plan summary, and the establishment of a 30 day comment period. (Reference-Title 25, § 71.31.c) Section V.E.2 of guidance.
	FOLLOWING A-	6. Copy of ALL written comments received and municipal response to each comment in relation to the proposed plan. (Reference-Title 25, 71.31.c) Section V.E.2 of guidance.
	A-8 to A-9	7. Project Implementation Schedule. (Provide projected milestone dates and be detailed for each existing and future needs area). (Reference - Title 25, § 71.31.d) Section F of Guidance.
	FOLLOWING A-13	8. Project Implementation Ordinances (Provide existing ordinances or include the development of new ordinances in the schedule of implementation.) (Reference-Title 25, § 71.21.a.5.vi.D) Section V.F of guidance.
	FOLLOWS COVER SHEET	9. Written documentation indicating that the appropriate agencies have received, reviewed and concurred with the method proposed to resolve identified inconsistencies within the proposed alternative and consistency requirements in 71.21.(a)(5)(i)-(iii). (Reference-Title 25, § 71.31.e) Appendix B of guidance.

GENERAL PLAN

I. Previous Wastewater Planning

A. Identify and analyze all existing wastewater planning that:

	A-1 to A-3	1. Has been previously undertaken under the Sewage Facilities Act (Act 537). (Reference-Act 537, Section 5, § d.1)
	ALL 1981-1985 PLANS EXECUTED	2. Has not been carried out according to an approved implementation schedule contained in the plans. (Reference-Title 25, § 71.21.a.5.i.A - D) Section V.F of Guidance.

DER Use Only	Indicate Page #(s) in Plan	Item Required
	2-2 & 3-17 & 3-20	3. Is anticipated or planned by applicable sewer authorities. (Reference-Title 25, § 71.21.a.5.i.A) Section V.D. of Guidance.
	ALL	4. Has been done through official plan revisions (planning modules) and addenda. (Reference-Title 25, § 71.21.a.5.i.A)
		B. Identify all municipal and county planning documents adopted pursuant to the Pennsylvania Municipalities Planning Code (Act 247) including:
	3-6 to 3-14	1. All land use plans and zoning maps which identify residential, commercial, industrial, agricultural, recreational, and open space areas. (Reference-Title 25, § 71.21.a.3.iv)
	3-6 to 3-14	2. A comparison of proposed land use as allowed by zoning and existing sewage facility planning. (Reference-Title 25, § 71.21.a.3.iv)
	3-9 to 3-14	3. Zoning or in the absence of zoning subdivision regulations that establish lot sizes predicated on sewage disposal methods. (Reference-Title 25, § 71.21.a.3.iv)
	3-8, 3-13, top of p. 1-7	4. All limitations and plans related to floodplain and stormwater management and special protection areas. (Reference-Title 25, § 71.21.a.3.iv) Appendix B, Section II.F.
	1-6 to 1-14, 1-18 to 1-19 AND 1-17. ALSO SEE 3-1, 3-8 AND 3-9,	5. An analysis of land use planning and zoning and its consistency with protecting environmentally sensitive areas, with special attention to: (Reference-Title 25, § 71.21.a.3.iv) - public ground/surface water supply sources - recreational water use areas - groundwater recharge areas - industrial water use - wetlands
		II. Physical and Demographic Analysis utilizing written description and mapping:
		A. Base line mapping (All maps should show all current lots and structures).
	1-4 to 1-6	1. Identification of Planning Area(s), Municipal Boundaries, Sewer Authority/ Management Agency service area boundaries. (Reference-Title 25, § 71.21.a.1.i)
	1-6 to 1-14 & 3-1 to 3-5	2. Identification and Mapping of Physical Characteristics (streams, lakes, impoundments, natural conveyance channels, drainage basins in the planning area). (Reference-Title 25, § 71.21.a.1.ii)
	1-7 to 1-14	3. Soils - Analysis with description by soil type and soils mapping (with any topographic limitations) showing areas suitable for conventional on-lot systems, elevated sand mounds, and areas unsuitable for on-lot systems. (Reference-Title 25, § 71.21.a.1.iii). Mapping of Prime Agricultural Soils and locally protected agricultural soils. (Reference - Title 25, § 71.21.a.5.i.K)
	1-7 to 1-9	4. Geologic Features - Identification through analysis, mapping and their relation to existing (including areas where existing nitrate-nitrogen levels are in excess of 5 mg/l) or potential nitrate-nitrogen pollution and drinking water sources. (Reference-Title 25, § 71.21.a.1.iii)

DER Use Only	Indicate Page #(s) in Plan	Item Required
	1-6A & 3-13	5. Topography - Showing slopes that are suitable for conventional systems; slopes that are suitable for elevated sand mounds and slopes that are unsuitable for on-lot systems. (Reference-Title 25, § 71.21.a.1.ii)
	1-18 to 1-20 & 3-9 (5th para.)	6. Potable Water Supplies - Identification through mapping, description and analysis to include available public water supply capacity and aquifer yield for groundwater supplies. (Reference-Title 25, § 71.21.a.1.vi) Section V.C. of the Guidance.
	1-17 to 1-18 & 1-8	7. Wetlands - Identify wetlands as defined in Title 25, Chapter 105 by description, analysis and mapping. Proposed collection, conveyance and treatment facilities and lines must be located and labeled, along with the identified wetlands, on the map. (Reference-Title 25, § 71.21.a.1.v) Appendix B, Section II.I.
	1-15 to 1-17 3-14 to 3-15	8. Population - List historical, current and future population figures and projections of the municipality. Discuss and evaluate any discrepancies between municipal, county, state (DER), and federal population projections as they relate to sewage facilities. (Reference-Title 25, § 71.21.a.1.iv)

III. Existing Sewage Facilities in the Planning Area.

A. Identify, map and describe municipal and nonmunicipal, individual and community sewerage systems in the planning area including:

	2-1 to 2-6	1. Location, size and ownership of treatment facilities, main intercepting lines, pumping stations and force mains including their size, capacity, point of discharge. Also include the name of the receiving stream, drainage basin, and the facility's effluent discharge requirements. (Reference-Title 25, § 71.21.a.2.i.A)
	2-1 to 2-6 2-6 to 2-12 2-23 to 2-29	2. A narrative and schematic diagram of the facility's basic treatment processes including the facility's NPDES permitted capacity, any remaining reserve capacity and the policy concerning the allocation of reserve capacity. (Reference-Title 25, § 71.21.a.2.i)
	2-6, 3-25 to 3-26,	3. A description of problems with existing facilities, including existing or projected overload under Title 25, Chapter 94 (relating to municipal wasteload management) or violations of a national pollutant discharge elimination system (NPDES) permit, Clean Streams Law permit, or other permit, rule or regulation of the Department. (Reference-Title 25, § 71.21.a.2.i.B)
	3-14 to 3-26	4. Details of scheduled or in-progress upgrading or expansion of treatment facilities and the anticipated completion date of the improvements. Also discuss the compatibility of the rate of growth to existing and proposed wastewater treatment facilities. (Reference-Title 25, § 71.21.a.4.i & ii)
	2-1 to 2-13 2-23 to 2-32	5. A detailed description of operation and maintenance requirements and the status of past and present compliance with these requirements and any other requirements relating to sewage management programs. (Reference-Title 25, § 71.21.a.2.i.C)
	4-1 to 4-28 3-25 & 3-26 A-2 to A-6	6. Ultimate disposal areas, if other than stream discharge (land application) and any applicable groundwater limitations. (Reference-Title 25, § 71.21.a.4.i & ii)

DER Use Only	Indicate Page #(s) in Plan	Item Required
		B. Identify, map and describe areas that utilize individual and community on-lot sewage disposal and retaining tank systems in the planning area including:
	2-21 & 2-22	1. The type of systems in use. (Reference-Title 25, § 71.21.a.2.ii.A)
	2-15 - 2-21	2. A description of documented and potential public health pollution, and operational problems (including malfunctioning systems) with the systems, including violations of local ordinances, the Sewage Facilities Act, the Clean Streams Law or regulation promulgated thereunder. (Reference-Title 25, § 71.21.a.2.ii.B)
	2-15 to 2-23 2-30 to 2-32	3. A comparison of the types of on-lot sewage systems installed in an area with the types of systems which are appropriate for the area according to soil, geologic conditions, topographic limitations, sewage flows, and Title 25 Chapter 73 (relating to standards for sewage disposal facilities). (Reference-Title 25, § 71.21.a.2.ii.C)
	NOT APPLICABLE	4. Conducting a well water survey to identify possible contamination by malfunctioning on-lot sewage disposal systems. Approximately 15% of the wells in the study area should be sampled. (Reference-Title 25, § 71.21.a.2.ii.B)
		C. Identify wastewater sludge and septage generation, transport, and disposal methods as it relates to sewage facilities alternative analysis including:
	2-3	1. Location of sources of wastewater sludge or septage (Septic tanks, holding tanks, wastewater treatment facilities). (Reference-Title 25, § 71.71)
	2-3 to 2-6	2. Quantities of the types of sludges or septage generated. (Reference-Title 25, § 71.71)
	2-3	3. Present disposal methods, locations, capacities, and transportation methods. (Reference-Title 25, § 71.71)
	NONE	D. Identify, map and describe areas in the municipality where unpermitted collection and disposal systems ("wildcat" sewers, borehole disposal, etc.) are in use. (Reference-Title 25, § 71.21.a.2.i.B)
		IV. Future Growth and Development
		A. Delineate and describe the following through map, text and analysis:
	3-1 to 3-15 3-16 to 3-26	1. Areas with existing development or plotted subdivisions. Include the name, location, description, total number of EDU's in development, total number of EDU's currently developed, and total number of Equivalent Dwelling Units (EDUs) remaining to be developed (include time schedule for EDU's remaining to be developed). (Reference-Title 25, § 71.21.a.3.i)
	3-2 & 3-6 to 3-9	2. Land use designations established under the Pennsylvania Municipalities Planning Code (35 P.S. 10101-11202), including residential, commercial and industrial areas. (Reference-Title 25, § 71.21.a.3.ii)
	3-14 to 3-26	3. Future growth areas and population and EDU projections for these areas. (Reference-Title 25, § 71.21.a.3.iii)

DER Use Only	Indicate Page #(s) in Plan	Item Required
	3-9 to 3-14	4. Zoning, subdivision regulations; local, county or regional comprehensive plans; and existing plans of a Commonwealth agency relating to the development, use and protection of land and water resources. (Reference-Title 25, § 71.21.a.3.iv)
		5. Sewage planning required to provide adequate wastewater treatment for areas of the municipality and related to:
	3-7 & 3-20 3-14 to 3-26 4-1 to 4-16	a. Five-year population and growth impacts on existing and proposed wastewater collection and treatment facilities which support the need for expansions of facilities within the five-year time frame. (Reference-Title 25, § 71.21.a.3.v)
	3-7 & 3-20 3-14 to 3-26 4-16 to 4-20	b. Ten-year population and growth impacts on existing and proposed wastewater collection and treatment facilities which support the need for expansions of facilities within the ten-year time frame. (Reference-Title 25, § 71.21.a.3.v)

V. Alternatives to Provide New or Improved Wastewater Disposal Facilities

A. Identify alternatives available to provide for new or improved sewage facilities for each area of need including, but not limited to: (Reference-Title 25, § 71.21.a.4)

	A-3 & A-4 3-25 to 3-26	1. Regional Wastewater Treatment Concepts. (Reference-Title 25, § 71.21.a.4)
	4-1 to 4-27	2. The potential for extension of existing municipal or non-municipal sewage facilities to areas in need of new or improved sewage facilities. (Reference-Title 25, § 71.21.a.4.i)
		3. The potential for the continued use of existing municipal or non-municipal sewage facilities through one or more of the following: (Reference-Title 25, § 71.21.a.4.ii)
	4-19 to 4-24	a. Repair. (Reference-Title 25, § 71.21.a.4.ii.A)
	4-19 to 4-24	b. Upgrading. (Reference-Title 25, § 71.21.a.4.ii.B)
	2-3 to 2-6 & 4-19 to 4-24	c. Improved operation and maintenance. (Reference-Title 25, § 71.21.a.4.ii.C)
	A-1 to A-5	d. Other applicable actions that will resolve or abate the identified problems. (Reference-Title 25, § 71.21.a.4.ii.D)
	4-1 to 4-18	4. The need for new community sewage systems. (Reference-Title 25, § 71.21.a.4.iii)
	6-1 to 6-14	5. The construction of new wastewater treatment facilities. (Reference-Title 25, § 71.21.a.4.iii)
	2-12 & 6-1 to 6-14	6. Repair or replacement of collection and conveyance system components. (Reference-Title 25, § 71.21.a.4.ii.A)
	6-1 to 6-16 & A-1 to A-7	7. Use of alternative methods of collection/conveyance to serve needs areas using existing wastewater treatment facilities. (Reference-Title 25, § 71.21.a.4.ii.B)

DER Use Only	Indicate Page #(s) in Plan	Item Required
		8. The continual and future use of individual and community subsurface sewage disposal system alternatives based on:
	1-9 to 1-14 2-23 & 6-14	a. Soil suitability. (Reference-Title 25, § 71.21.a.2.ii.C)
	NOT APPLICABLE	b. Preliminary hydrogeological evaluation. (Reference-Title 25, § 71.21.a.2.ii.C)
	A-8 & A-11 & 4-21	c. The establishment of a sewage management program. (Reference-Title 25, § 71.21.a.4.iv)
		9. The repair, replacement or upgrading of existing malfunctioning systems in areas suitable for on-lot disposal considering: (Reference-Title 25, § 71.21.a.4)
	4-20 to 4-24	a. Existing technology and sizing requirements of Title 25 Chapter 73. (Reference-Title 25, § 73.31 - 73.72)
	2-27, 2-31, 2-32 4-21 & 4-22	b. Use of expanded absorption areas or alternating absorption areas. (Reference-Title 25, § 73.16)
	3-9 - 5th para.	c. Use of water conservation devices. (Reference-Title 25, § 71.73.b.2.iii)
		10. The use of small flow sewage treatment facilities, land treatment alternatives, or package treatment facilities to serve individual homes or clusters of homes based on: (Reference-Title 25, § 71.21.a.4)
	A-4 PRIORITY 6	a. Discharge Requirements. (Reference-Title 25, § 71.64.d)
	N. A.	b. Soil Suitability. (Reference-Title 25, § 71.64.c.1)
	N. A.	c. Preliminary Hydrogeologic Evaluation. (Reference-Title 25, § 71.64.c.3)
	A-8	d. Agency or other controls over operation and maintenance requirements. (Reference-Title 25, § 71.64.d)
		11. The use of retaining tank altornatives including: (Reference-Title 25, § 71.21.a.4)
	A-4 - PRIORITY 7	a. Commercial, residential and industrial use. (Reference-Title 25, § 71.63.e)
	ORDINANCE #105	b. Designated conveyance facilities (pumper trucks). (Reference-Title 25, § 71.63.b.2)
	ORDINANCE #105	c. Designated treatment facilitiee or disposal site. (Reference-Title 25, § 71.63.b.2)
	ORD. #105	d. Implementation of a retaining tank ordinance by the municipality. (Reference-Title 25, § 71.63.c.3)
	ORD #105	e. Financial guarantaee when retaining tanks are used ae an interim sewage disposal measure. (Reference-Title 25, § 71.63.c.2)
	ORD #105	f. Temporary or permanent use.

DER Use Only	Indicate Page #(s) in Plan	Item Required
	NOT ADDRESSED	12. A no-action alternative which includes both short-term and long-term impacts on: (Reference-Title 25, § 71.21.a.4)
		a. Water Quality/Public Health. (Reference-Title 25, § 71.21.a.4)
		b. Growth potential (residential, commercial, industrial). (Reference-Title 25, § 71.21.a.4)
		c. Community economic conditions. (Reference-Title 25, § 71.21.a.4)
		d. Recreational opportunities. (Reference-Title 25, § 71.21.a.4)
		e. Drinking water sources. (Reference-Title 25, § 71.21.a.4)
		f. Other environmental concerns. (Reference-Title 25, § 71.21.a.4)
		13. Discuss the need for and implementation of a sewage management program to assure the future operation and maintenance of existing and proposed sewage facilities through:
	4-20 to 4-24	a. Municipal ownership or other management control over the operation and maintenance of individual on-lot sewage disposal systems, small flow treatment facilities, or other non- municipal treatment facilities. (Reference-Title 25, § 71.21.a.4.iv)
	4-21	b. Requiring scheduled inspection of on-lot sewage disposal systems. (Reference-Title 25, § 71.73.h.1)
	ORDINANCE #105	c. Requiring scheduled maintenance of septic and aerobic treatment tanks and associated system components. (Reference-Title 25, § 71.73.b.2)
	4-20 to 4-24	d. Aggressive enforcement of ordinances which require operation and maintenance and prohibit malfunctioning systems. (Reference-Title 25, § 71.73.b.5)
	ORDINANCE #105 & 4-21	e. Repair, replacement or upgrading of malfunctioning on-lot sewage systems. (Reference-Title 25, § 71.21.a.4.iv)
	A-5 to A-8	f. Establishment of joint municipal sewage management programs. (Reference-Title 25, § 71.73.b.8)
	6-7 & 6-8	g. Reduction of organic or hydraulic loading to existing wastewater treatment facilities. (Reference-Title 25, § 71.71)
	4-22 & ORD. #105	h. Requirements for bonding, escrow accounts, management agencies or associations to assure proper operation and maintenance for non-municipal facilities. (Reference-Title 25, § 71.71)
		14. Non-structural comprehensive planning alternatives that can be undertaken to assist in meeting existing and future sewage disposal needs including: (Reference-Title 25, § 71.21.a.4)
	NEW (1992) 3-6 to 3-9	a. Modification of existing comprehensive plans involving:
		1. Land use designations. (Reference-Title 25, § 71.21.a.4)

DER Use Only	Indicate Page #(s) in Plan	Item Required
	3-6	2. Densities. (Reference-Title 25, § 71.21.a.4)
	3-9 to 3-14	3. Municipal ordinances and regulations. (Reference-Title 25, § 71.21.a.4)
	3-1 to 3-14	4. Improved enforcement. (Reference-Title 25, § 71.21.a.4)
	1-18 & 1-19	5. Protection of drinking water sources. (Reference-Title 25, § 71.21.a.4)
	3-6 to 3-14	b. Need for a comprehensive plan to assist in producing sound economic and consistent land development. (Reference-Title 25, § 71.21.a.4)
	ORD. # 105	c. Alternatives for creating or changing municipal subdivision regulations to assure long-term use of on-site sewage disposal. (Reference-Title 25, § 71.21.a.4)
	4-23 & 4-24	d. Evaluation of existing local agency programs and the need for technical or administrative training. (Reference-Title 25, § 71.21.a.4)

VI. The Evaluation of Alternatives

A. Each technically feasible alternative identified in Section V of this check-list must be evaluated for consistency with respect to the following: (Reference-Title 25, § 71.21.a.5.i)

	5-1 to 5-3	1. Applicable plans developed and approved under Sections 4 and 5 of the Clean Streams Law or Section 208 of the Clean Water Act (33 U.S.C.A. 1288). (Reference-Title 25, § 71.21.a.5.i.A) Appendix B, Section II.A.
	5-3	2. Municipal wasteload management plans developed under PA Code, Title 25, Chapter 94. (Reference-Title 25, § 71.21.a.5.i.B) The municipality's recent Wasteload Management (Chapter 94) Reports should be examined to determine if the proposed alternative is consistent with the recommendations and findings of the report. (Appendix B, Section II.B.
	5-4 & 5-5	3. Plans developed under Title II of the Clean Water Act (33 U.S.C.A. 1281-1299) or Titles II and VI of the Water Quality Act of 1987 (33 U.S.C.A. 1251-1376). (Reference-Title 25, § 71.21.a.5.i.C) Appendix B, Section II.E.
	5-5	4. Comprehensive plans developed under the Pennsylvania Municipalities Planning Code. (Reference-Title 25, § 71.21.a.5.i.D) The municipality's comprehensive plan must be examined to assure that the proposed wastewater disposal alternative is consistent with land use and all other requirements stated in the comprehensive plan. Appendix B, Section II, D.
	5-5 to 5-6	5. Antidegradation requirements as contained in PA Code, Title 25, Chapters 93, 95 and 102 (relating to water quality standards, wastewater treatment requirements and erosion control) and the Clean Water Act. (Reference-Title 25, § 71.21.a.5.i.E) Appendix B, Section II, F.
	5-4 & 5-5	6. State water plans developed under the Water Resources Planning Act (42 U.S.C.A. 1962-1962 d-18). (Reference-Title 25, § 71.21.a.5.i.F) Appendix B, Section II, C.

DER Use Only	Indicate Page #(s) in Plan	Item Required
	5-6	7. Pennsylvania Prime Agricultural Land Policy contained in Title 4 of the Pennsylvania Code, Chapter 7, Subchapter W. Provide narrative on local municipal policy and an overlay map on prime agricultural soils. (Reference-Title 25, § 71.21.a.5.i.G) Appendix B Section II.G.
	5-6	8. County Stormwater Management Plans approved by the Department under the Storm Water Management Act (32 P.S. 680.1-680.17). (Reference-Title 25, § 71.21.a.5.i.H) Conflicts created by the implementation of the proposed wastewater alternative and the existing recommendations for the management of stormwater in the County Stormwater Management Plan must be evaluated and mitigated. If no plan exists, no conflict exists. Appendix B, Section II.H.
	5-6 & 5-7	9. Wetland Protection under PA Code, Title 25, Chapter 105. Map wetland areas using Federal National Wetlands Inventory Mapping and Soils Mapping. (Reference-Title 25, § 71.21.a.5.i.I) Identify and provide mitigative measures for any encroachments on wetlands from the construction or operation of any wastewater facilities proposed by the alternative. Appendix B, Section II.I.
	5-7	10. Protection of rare, endangered or threatened plant and animal species as identified by the Pennsylvania National Diversity Inventory (PNDI). (Reference-Title 25, § 71.21.a.5.i.J) Provide the Department with a copy of the completed Request For PNDI Search document. Also provide a copy of the response letter from the Department's Bureau of Forestry regarding the findings of the PNDI search. Appendix II. J.
	5-7	11. Historical and Archaeological Resource Protection under P.C.S. Title 37, Section 507 relating to cooperation by public officials with the Pennsylvania Historical and Museum Commission. (Reference-Title 25, § 71.21.a.5.i.K) Provide the Department with a completed copy of Form "A" and its attachments requesting the Bureau of Historic Preservation (BHP) to provide a listing of known historical sites and potential impacts on known archaeological and historical sites. Also provide a copy of the response letter from the BHP. Appendix B, Section II. K.
	5-7 to 5-10	B. Provide for the resolution of any inconsistencies in any of the points identified in Section VI.A. of this checklist by submitting written documentation that the appropriate agency has received, reviewed, and concurred with the method proposed to resolve identified inconsistencies. (Reference-Title 25, § 71.21.a.5.ii) Appendix B
	5-9 & 5-10	C. Evaluate each alternative identified in Section V of this checklist with respect to applicable water quality standards, effluent limitations or other technical, legislative or legal requirements. (Reference-Title 25, § 71.21.a.5.iii)
	5-10 to 5-14	D. Provide cost estimates using present worth analysis for construction, financing, ongoing administration, operation and maintenance and user fees for each alternative identified in Section V of this checklist. Estimates shall be limited to areas identified in the plan as needing improved sewage facilities within 5 years from the date of plan submission. (Reference-Title 25, § 71.21.a.5.iv)
	5-14 to 5-16	E. Provide an analysis of the funding methods available to finance each of the proposed alternatives evaluated in Section V of this checklist. Also provide documentation to demonstrate which alternative and financing scheme combination is the most cost-effective; and a contingency financial plan to be used if the preferred method of financing cannot be implemented. The funding analysis shall be limited to areas identified in the plan as needing improved sewage facilities within five years from the date of the plan submission. (Reference-Title 25, § 71.21.a.5.v)

DER Use Only	Indicate Page #(s) in Plan	Item Required
		F. Analyze the ability of the municipality to implement each alternative proposed in Section V of this report including: (Reference-Title 25, § 71.21.a.5.vi)
	4-23 & 4-24	1. The activities necessary to abate critical public health hazards pending completion of sewage facilities or sewage management programs. (Reference-Title 25, § 71.21.a.5.vi.A)
	A-7 to A-9	2. The phased development of the facilities or sewage management program. (Reference-Title 25, § 71.21.a.5.vi.B)
	A-8 & A-9	a. Provide time schedules for implementing each phase. (Reference-Title 25, § 71.21.a.5.vi.C)
	4-21 & 5-14	3. The administrative organization and legal authority necessary for plan implementation. (Reference-Title 25, § 71.21.a.5.vi.D)

VII. Institutional Evaluation

		A. Provide an analysis of all existing wastewater treatment authorities, their past actions and present performance including:
	5-14 & 5-15 & 5-10	1. Financial & debt status. (Reference-Title 25, § 71.61.d.2.)
	4-23 & 4-24	2. Available staff and administrative resources. (Reference-Title 25, § 71.61.d.2.)
	SEC. 5, ACT 537	3. Existing legal authority to:
	A-9-A & 5-14	a. Implement wastewater planning recommendations. (Reference-Title 25, § 71.61.d.2.)
	4-23 & 5-14	b. Implement system-wide operation and maintenance activities. (Reference-Title 25, § 71.61.d.2.)
	5-14 - 5-15	c. Set user fees and take purchasing actions. (Reference-Title 25, § 71.61.d.2.)
	ORD. 105 - SEC. VII	d. Take actions against adopted ordinance violators. (Reference-Title 25, § 71.61.d.2.)
	SECOND CLASS TWSP. CODE	e. Negotiate agreements with other parties. (Reference-Title 25, § 71.61.d.2.)
	SECOND CLASS TWSP. CODE & PA. MUNICIPAL AUTH. ACT	f. Raise capital for construction and operation and maintenance of facilities. (Reference-Title 25, § 71.61.d.2.)
		B. Provide an analysis and description of the various institutional alternatives necessary to implement the proposed alternative including:
	NONE	1. Need for new authorities. (Reference-Title 25, § 71.61.d.2.)
	4-23 & 4-24, 5-10	2. Functions of existing and proposed organizations (sewer authorities, etc.). (Reference-Title 25, § 71.61.d.2.)
	5-10	3. Cost of administration, implementability, and the capability of the authority to react to future needs. (Reference-Title 25, § 71.61.d.2.)

DER Use Only	Indicate Page #(s) in Plan	Item Required
		C. Describe all necessary administrative and legal activities to be completed and adopted to ensure the implementation of the recommended alternative including:
	NOT APPLICABLE - EXISTING	1. All legal authorities of incorporation. (Reference-Title 25, § 71.61.d.2.)
	ORD # 105 ADOPTED	2. All required ordinances, regulations, standards, and inter-municipal agreements. (Reference-Title 25, § 71.61.d.2.)
	A-1 TO A-7	3. Activities to provide rights-of-way, easements, and land transfers. (Reference-Title 25, § 71.61.d.2.)
	N.A.	4. Other municipal sewage facilities plan adoptions. (Include the development of Items 1-4 on the project's schedule of implementation). (Reference-Title 25, § 71.61.d.2.)
	A-8	5. Any other legal documents. (Reference-Title 25, § 71.61.d.2.)
	A-1 to A-8	D. Identify the chosen institutional alternative for implementing the chosen wastewater disposal alternative. Provide justification for choosing the specific alternative. (Reference-Title 25, § 71.61.d.2.)

VIII. Selected Wastewater Treatment & Institutional Alternatives

		A. Select one technical wastewater disposal alternative which best meets the wastewater treatment needs of each area of the municipality studied. Justify the choices by providing documentation which shows that they are the best alternative(s) based on:
	A-2 to A-7	1. Wastewater disposal needs. (Reference-Title 25, § 71.21.a.6.)
	4-23 to 4-24	2. Technical and administrative needs. (Reference-Title 25, § 71.21.a.6.)
	5-10 to 5-16 A-7 & A-8	3. Cost-effectiveness. (Reference-Title 25, § 71.21.a.6.)
	4-23 & 4-24	4. Management and administration systems available. (Reference-Title 25, § 71.21.a.6.)
	5-10 to 5-16	5. Financing methods available. (Reference-Title 25, § 71.21.a.6.)
	6-1 to 6-16	6. 5 and 10 year planned growth areas. (Reference-Title 25, § 71.21.a.6.)
	5-1 to 5-10	7. Environmental soundness and compliance with natural resource planning and preservation programs. (Reference-Title 25, § 71.21.a.6.)
	5-10 to 5-16 A-7 to A-8	B. Describe the capital financing plan chosen to implement the selected alternative(s).

EAST GOSHEN TOWNSHIP

ACT 537 PLAN UPDATE

DECEMBER 1992

REVISED JUNE 1994

SMC Environmental Services Group

P.O. Box 859

Valley Forge, PA 19482

September 14, 1994

FINAL ADDENDUM TO THE EAST GOSHEN TOWNSHIP ACT 537 PLAN UPDATE AS A RESULT OF THE MOST RECENT CHESTER COUNTY PLANNING AGENCY REVIEWS

As a result of the Chester County Planning Commission and Health Department reviews and the comments received from adjacent municipalities, the East Goshen Township Act 537 Plan was substantially revised in several ways. First, Addenda reports were prepared and attached to selected sections of the original report. The Plan Summary and the various Addenda are printed on yellow paper in this report. Further text modifications are "highlighted" to show the various response items and text changes required by comments from the Planning agencies.

A meeting with the County agencies was held at the East Goshen Township building on July 7, 1994 to review the basic plan addenda, text changes, and changes in concept.

The Chester County Health Department responded under date of August 11, 1994. This latest review requires three basic comments. First, the reported "confusion" regarding text/tables has been eliminated. Within this addendum, Table 3.6a, Table 3.7a, and Table 3.8 have been prepared to address the County Health Department's comment regarding text/table confusion.

The second comment regards this submission to PaDER as being premature since West Goshen Township has not yet amended their Act 537 Plan to accommodate the plant expansion. Further, the Health Department points out that there is no commitment from West Goshen to accept the additional flows from the Township. The County Health Department clearly indicates that it would support East Goshen's first selected alternative should West Goshen complete their planning and gain approval from PaDER.

The final comment from the County Health Department review addresses a pro-active role in the management of the Willow Pond COLDS. The adoption of Ordinance 105 during June 1994 now fully involves East Goshen Township in the monitoring/management of the Willow Pond COLDS. Monthly monitoring reports are now received and reviewed by East Goshen Township.

East Goshen Township fully concurs with the comments contained in the County Health Department letter.

The Chester County Planning Commission responded to the latest revised plan on August 19, 1994. The basic position of the County Planning Commission is the same as that of East Goshen Township. The Planning Commission points out that "The Township will find itself in a difficult position if the West Goshen Alternative cannot be implemented." The County also believes that this submission to PaDER is premature without West Goshen concurrence. East Goshen Township is fully aware that agreements must be reached with West Goshen in order to properly effectuate this updated 537 Plan.

As in the County Health Department review, the County Planning Commission specifically requested an updating of the Tables 3.6 and 3.7. The Township has responded in part by preparing the aforementioned Table 3.6a, Table 3.7a, and Table 3.8. The additional mapping requested by the County Planning Commission cannot be prepared until East Goshen agrees with West Goshen as to the specific service areas within East Goshen Township and possibly East Whiteland Township which would be served under an agreement between the two Townships. The Township will respond to the request for additional mapping after reaching some form of agreement with West Goshen Township.

The Township is in agreement with the County Planning Commission's suggestion as to the minor modification in the rank order of priority of treatment methods selected by East Goshen Township. The Township has already expressed within this plan a requirement that the developers of the Woods/Sherman property will be required to exhaust prioritized alternatives before the consideration of public sewer extensions to this area is approved.

In summary, East Goshen Township feels that it has adequately responded to both of the County agency review letters.

New Tables 3.6a, 3.7a, and 3.8

The Township has prepared new allocation tables dated August 30 and August 31, 1994 which reflect a number of changes. Table 3.6a (which is a facsimile of Table 3.6), now utilizes the updated 1993 average daily flow. In addition, the new EDU daily flow figures recommended in the plan have been utilized in lieu of the higher previous figures. Further, all of the projects indicated under the column "GPD Committed or in Process" in the prior Table 3.6 have been updated and incorporated in the column related to "online facilities."

Table 3.6a still shows a distinct difference between the 937,274 gpd based on expected theoretical flows and the 1993 average daily flow of 815,192 gpd which was based on actual recorded figures. In essence, this means that there is still a

TABLE 3.6 a
ALLOCATION OF SEWAGE FLOW TO
WEST GOSHEN SEWAGE TREATMENT PLANT

AREA TO BE SERVED	ZONED	GPD ON LINE	GPD COMMITTED IN PROCESS	1993–1997 PROBABLE	1998–2002 PROBABLE	POTENTIAL 2002 >
EIGH ESTATES (8 SFD)	R–2	550	1,650			
BITTERSWEET (49 SFD)	R–2	13,475				
GRAND OAK (141 SFD)	R–2	38,775				
MARYDELL (159 SFD)	R–2	43,725				
MILLCREEK ESTATES(33 SFD)	R–2	9,075				
PIN OAKS (112 SFD)	R–2	30,800				
MISAK DR EXTENSION (8 SFD)	R–2	2,200				
MEADOWS (35 SFD)	R–2	9,625				
ROCKLAND VILLAGE (74 SFD)	R–2	20,350				
SUPPLEE VALLEY (96 SFD)	R–2	26,950				
HICKORY GLEN (9 SFD)	R–2	2,475				
WATERVIEW (66 SFD)	R–2	18,150				
RESERVOIR ROAD (2 SFD)	R–2	550	550			14,575
PRICE PROPERTY (129.6 ACRES)	R–2				13,750	21,725
STRASBURG ROAD	R–2	11,825				
ELLIS LANE	R–2	1,100	1,375			
STURBRIDGE	R–2	2,475				
BRANDOLINI/MORSTEIN RD. (KILLERN – 9 SFD)	R–3	2,475				
HILLOCH MANOR (7 SFD)	R–2	1,925				
WHITE CHIMNEYS(CHESTER HOLLOW–71 SFD)	R–2	19,525				
WENTWORTH (12 SF)	R–2	3,300				
GOSHEN HEIGHTS (70 SFD)	R–2	19,250				
PARK AVENUE	R–3	9,625				
FIRE HOUSE (13 ACRES)				5,500	7,425	
FEDOR (175 APTS)	R–4			35,000		
TREE TOPS (200 APTS)	R–4	40,000				
HIGHSPIRE (76 TOWNHOUSES)	R–4	17,550				
DUTT'S MILL (33 UNITS & 15 FUTURE)	R–5	7,425	3,375			
GOSHEN VALLEY (656 APTS/TH)	R–5	147,600				
RIDGEWOOD APTS (60 UNITS)	R–5	13,500				
WALNUT HILL ROAD (4 SFD)	R–5	1,100				
AUDUBON (35 TOWNSHOUSE UNITS)	R–5	7,875				
SMITHFIELD APTS. (198 UNITS)	R–5	39,600				
MISCELLANEOUS (7.3 ACRES)	R–5			4,950		
W.C. PIKE (9)	C–1	3,150				
STEEPLECHASE (81 TOWNHOUSES)	C–1	18,225				
ROSE HILL APTS (166 UNITS)	C–4	33,200				
OSE HILL COMMERCIAL	C–4	8,000				
QUET CLUB APTS (71 UNITS)	C–4	14,200				
ERVIEW APTS (203 UNITS)	C–4	40,600				
MMERCIAL ((3)	C–4	7,000				
W. C. PIKE (12.9 ACRES)	C–4	6,875		7,500		
GOSHEN CORP. PARK*	BP/I–1	30,609	9,391			
GOSHEN OFFICE ASSOCIATES	BP/I–1	3,000				
HICKS ***(GOSHEN CORP PARK WEST)						
93.3 ACRES	I–1	4,913	22,192			
13.5 ACRES (53–3–1.2)COMMONS @ GOSHEN	I–1	4,200				
14.9 ACRES (53–3–1.2B)	I–1			4,544		
11.8 ACRES (53–3–1.7/MILKSTORE)*	BP	573	3,026			
HICKS – BALANCE (34.8 & 36.7 ACRES)	BP				21,807	
BRANDYWINE INDUSTRIAL PARK						
MARS*	BP/I–1	13,114	9,386			
CALECO*	BP/I–1	615				
(BRANDYWINE PLAZA) WILSON PROPERTY	BP/I–1		10,800			
STS PETER AND PAUL CHURCH	R–2				1,150	
GREEN ACRES (3 SFD)	R–2				825	
STRASBURG RD/ROUTE 352 (20 SFD)	R–2				5,500	
PUMPED FROM RIDLEY CREEK						
NEW KENT APTS (384 APTS)	R–5	76,800				
HERSHEY MILL ESTATES (142 SFD)	R–2	39,050				
FAIRWAY VILLAGE (38 SFD)	R–2	10,450				
ASHBRIDGE/FIRETHORNE (170 SFD)	R–2	46,750				
WYLLPEN (17 SFD)	R–2	550	4,125			
HUNTER'S RUN (6 SFD)	R–2	550	1,550			
WINDERMERE (60 APT.)	R–4	12,000				
CHARTER CHASE (98 SFD)	R–2					26,950
MILL VALLEY (25 SFD)	R–2					6,875
MILLSTREAM DRIVE (25 SFD)	R–2					6,875
GOSHEN DOWNS (12 SFD)	R–2					3,300
TOTAL		937,274	67,520	57,494	50,457	80,300

1993 AVERAGE DAILY FLOW 815,191
(W.G. NUMBER)
% TOTAL ON–LINE VS ACTUAL GPD = 87%

JECTED ON LINE/COMMITTED &
BABLE 1,193,045

FACTORS USED:
SFD = 275 GPD
TOWNHOUSE = 225 GPD
APARTMENTS = 200 GPD

daily flow difference of 122,000 gpd between theoretical and actual flow, and the ratio for total online sewage flow is 87 percent of project theoretical flow.

Table 3.6a also contains a figure for the conversion of daily flow from the New Kent Apartments (76,800 gpd) showing removal from the Ridley Creek Watershed and being diverted to Chester Creek Watershed.

With regard to Table 3.7a, which is a facsimile of the original Table 3.7, the reduced daily flows for each type of EDU have now been incorporated for use in this table. The New Kent Apartments, currently connected to the Ridley Creek plant, have been removed from Table 3.7a and now appear in Table 3.6a. Also, those projects or properties previously reflected as being "committed and/or in process" have now been properly shown in the column where online conditions have been established.

It is noteworthy that the gpd online is very consistent with the average 1993 plant flow. In addition, certain projects shown in Table 3.7a have been shifted to the future connections considered necessary beyond the year 2002. This has been done based upon the adoption of Ordinance 105 which may remove the future need for public sewers for the four projects or properties depicted.

Although 40,000 gpd is still shown for future connection for the Bryn Mawr Rehabilitation facility, a recent letter from that agency requested only 25,000 gpd for future treatment at the Ridley Creek STP.

West Goshen Alternative

Table 3.8 has been developed as a new allocation alternative which would be based on primarily on approval of the "West Goshen Alternative" described in this plan update. The distinct difference between Table 3.8 and Table 3.6a is that approximately 231,000 gpd in additional flows would be added which is directly related to facilities currently located in East Whiteland Township (William Henry Apartments and Immaculata College). Again, as in Table 3.6a, the reduced EDU daily flow factors have been utilized.

It should be noted that Tables 3.6a, 3.7a, and 3.8 were actually published in September 1994. Most of the text material contained in this 1994 Plan was developed during 1992 through 1994. There will now be some differences in text as compared with the newly-updated tables. With this in mind, the new tables contained in this addendum will govern the current estimates or allocations of flows to Ridley Creek and to Chester Creek.

TABLE 3.7a
ALLOCATION OF SEWAGE FLOW TO
RIDLEY CREEK SEWAGE TREATMENT PLANT
AUGUST 31, 1994

AREA TO BE SERVED	ZONED	GPD ON-LINE	GPD COMMITTED &/OR IN PROCESS	1993-1997 PROBABLE	1998-2002 PROBABLE	POTENTIAL 2002>
BOW TREE FARMS - 480 SFD	R-2	90,750	41,250	*		
VISTA FARMS - 65 SFD	R-2	17,875				
HUNT COUNTRY - 71 SFD	R-2	19,525				
WENTWORTH - 65 SFD	R-2	17,875	6,875	*		
E.G. ELEMENTARY SCHOOL	R-2	10,000				
S.K. BEECHAM	I-2	10,000	30,000	*		
GOSHEN VILLAGE COMMERCIAL	C-5	13,000				
HANCOCK BUILDING (FUCHS)	C-2	3,600				
PHASE II- HANCOCK BLDG			2,400	*		
PAOLI PIKE	C-5	5,950	350	*		
(352/PAOLI CORNER)						
TAYLOR/HIGHLAND (64 EDU)	R-2	17,600				
SPINOZZI & MCCLOSKEY (10 EDU)	R-2		1,375	*	1,375	
COVENTRY WOODS (16 EDU)	R-2		4,400	*		
WATERFORD (26 EDU)	R-2	7,150				
MEADOWBROOK/CORNWALLIS AREA	R-2		20,900			
BELLINGHAM LIFE CARE	I-2	28,000				
BENTLEY CONSTRUCTION	C-5	900				
PHILA SUB. - HUNT COUNTRY		157				
==========						
WOODS PROPERTY (85.9 ACRES)	R-2				23,650	
SHERMAN PROPERTY (37.8 ACRES)	R-2				10,175	
WILLOW POND (28 SFD)**	R-2					7,700
INDIAN HILLS **	R-2					11,825
OLD ORCHARD/IVY/RAEWYCK**	R-2					7,975
N. CHESTER RD MISC (82 SFD)**	R-2					22,550
==========						
WILLISTOWN TOWNSHIP						
BRYN MAWR REHAB				40,000		
AL ON LINE		242,382	107,550	40,000	35,200	50,050

TOTAL ON LINE/COMMITTED/PROBABLE 425,132

AVG 1993 PLANT FLOW = 246,178
246,178/242,382 = 98.46%

* COMMITTED AND PAID FOR
** MOVED TO THE 2002> BECAUSE IT IS HOPED THAT THE ON-LOT MANAGEMENT ORDINANCE WILL DELAY OR NEGATE ANY NEED FOR PUBLIC SEWERS
FACTORS USED: SFD = 275 GPD/UNIT
APTS = 200 GPD/UNIT

TABLE 3.8
WEST GOSHEN ALTERNATIVE
WEST GOSHEN SEWAGE TREATMENT PLANT
AUGUST 30, 1994

AREA TO BE SERVED	ZONED	GPD ON LINE	GPD COMMITTED IN PROCESS	1993–1997 PROBABLE	1998–2002 PROBABLE	POTENTIAL 2002 >
ARDLEIGH ESTATES (8 SFD)	R–2	550	1,650			
BITTERSWEET (49 SFD)	R–2	13,475				
GRAND OAK (141 SFD)	R–2	39,775				
MARYDELL (159 SFD)	R–2	43,725				
MILLCREEK ESTATES(33 SFD)	R–2	9,075				
PIN OAKS (112 SFD)	R–2	30,800				
MISAK DR EXTENSION (8 SFD)	R–2	2,200				
MEADOWS (35 SFD)	R–2	9,625				
ROCKLAND VILLAGE (74 SFD)	R–2	20,350				
SUPPLEE VALLEY (98 SFD)	R–2	26,950				
HICKORY GLEN (9 SFD)	R–2	2,475				
WATERVIEW (66 SFD)	R–2	18,150				
RESERVOIR ROAD (2 SFD)	R–2	550	550			14,575
PRICE PROPERTY (129.6 ACRES)	R–2				13,750	21,725
STRASBURG ROAD	R–2	11,825				
ELLIS LANE	R–2	1,100	1,375			
STURBRIDGE	R–2	2,475				
BRANDOLINI/MORSTEIN RD. (9 SFD)	R–3	2,475				
HILLOCH MANOR (7 SFD)	R–2	1,925				
WHITE CHIMNEYS(CHESTER HOLLOW–71 SFD)	R–2	19,525				
WENTWORTH (12 SF)	R–2	3,300				
GOSHEN HEIGHTS (70 SFD)	R–2	19,250				
PARK AVENUE	R–3	9,625				
FIRE HOUSE (13 ACRES)				5,500	7,425	
FEDOR (175 APTS)	R–4			35,000		
TREE TOPS (200 APTS)	R–4	40,000				
HIGHSPIRE (78 TOWNHOUSES)	R–4	17,550				
DUTT'S MILL (33 UNITS & 15 FUTURE)	R–5	7,425	3,375			
GOSHEN VALLEY (656 APTS/TH)	R–5	147,600				
RIDGEWOOD APTS (60 UNITS)	R–5	13,500				
WALNUT HILL ROAD (4 SFD)	R–5	1,100				
AUDUBON (35 TOWNSHOUSE UNITS)	R–5	7,875				
SMITHFIELD APTS. (198 UNITS)	R–5	39,600				
MISCELLANEOUS (7.3 ACRES)	R–5			4,950		
W.C. PIKE (9)	C–1	3,150				
EEPLECHASE (81 TOWNHOUSES)	C–1	18,225				
E HILL APTS (166 UNITS)	C–4	33,200				
E HILL COMMERCIAL	C–4	8,000				
QUET CLUB APTS (71 UNITS)	C–4	14,200				
WATERVIEW APTS (203 UNITS)	C–4	40,600				
COMMERCIAL ((3)	C–4	7,000				
W. C. PIKE (12.9 ACRES)	C–4	6,875		7,500		
GOSHEN CORP. PARK*	BP/I–1	30,609	9,391			
GOSHEN OFFICE ASSOCIATES	BP/I–1	3,000				
HICKS ***(GOSHEN CORP PARK WEST)						
93.3 ACRES	I–1	4,913	22,192			
13.5 ACRES (53–3–1.2)COMMONS @ GOSHEN	I–1	4,200				
14.9 ACRES (53–3–1.2B)	I–1			4,544		
11.8 ACRES (53–3–1.7/MILKSTORE)*	BP	573	3,026			
HICKS – BALANCE (34.8 & 36.7 ACRES)	BP				21,807	
BRANDYWINE INDUSTRIAL PARK						
MARS*	BP/I–1	13,114	9,386			
CALECO*	BP/I–1	615				
(BRANDYWINE PLAZA) WILSON PROPERTY	BP/I–1		10,800			
STS PETER AND PAUL CHURCH	R–2				1,150	
GREEN ACRES (3 SFD)	R–2				825	
STRASBURG RD/ROUTE 352 (20 SFD)	R–2				5,500	
PUMPED FROM RIDLEY CREEK						
NEW KENT APTS (384 APTS)	R–5	76,800				
HERSHEY MILL ESTATES (142 SFD)	R–2	39,050				
FAIRWAY VILLAGE (38 SFD)	R–2	10,450				
ASHBRIDGE/FIRETHORNE (170 SFD)	R–2	46,750				
WYLLPEN (17 SFD)	R–2	550	4,125			
HUNTER'S RUN (6 SFD)	R–2	550	1,650			
WINDERMERE (60 APT.)	R–4	12,000				
CHARTER CHASE (98 SFD)	R–2					26,950
MILL VALLEY (25 SFD)	R–2					6,875
MILLSTREAM DRIVE (25 SFD)	R–2					6,875
GOSHEN DOWNS (12 SFD)	R–2					3,300
EAST WHITELAND TOWNSHIP						
WM HENRY APTS					59,000	37,000
IMMACULATA COLLEGE						135,000
TOTAL		937,274	67,520	57,494	109,457	252,300

93 AVERAGE DAILY FLOW 815,191
(W.G. NUMBER)
% TOTAL ON–LINE VS ACTUAL GPD = 87%

PROJECTED ON LINE/COMMITTED & PROBABLE 1,424,045

FACTORS USED
SFD = 275 GPD
TOWNHOUSE = 225 GPD
APARTMENT = 200 GPD

THE COUNTY OF CHESTER

Commissioners:
Joseph J. Kenna, Chairman
Karen L. Martynick
Andrew E. Dinniman

CHESTER COUNTY HEALTH DEPARTMENT
Chester County Government Services Center
601 Westtown Road, Suite 295
West Chester, PA 19382-4543
(610) 344-6237
FAX (610) 344-6727

August 11, 1994

Louis F. Smith, Jr. Township Manager
East Goshen Township
1580 Paoli Pike
West Chester, PA 19380-6199

RE: East Goshen Township Act 537 Plan Update

Dear Mr. Smith:

The Chester County Health Department has reviewed the document entitled "East Goshen Township Act 537 Plan Update" as prepared by SMC Environmental Services Group last revised June 1994. The plan proposes to utilize the West Goshen wastewater treatment plant to serve the majority of the sewage needs of East Goshen Township. This involves re-routing of some flows which presently flow into the East Goshen Ridley Creek wastewater plant. Additionally, the township has adopted an ordinance requiring routine maintenance of individual and community on-lot sewage disposal systems.

The document as presented is very confusing and unclear as text has been changed but corresponding figures and tables have not. It would be beneficial to update the tables and provide a clear graphic interpretation on the areas to be serviced by the respective wastewater plants.

It appears that this submission may be premature as the selected alternative does not seem to be implementable as West Goshen has not amended their 537 plan to accommodate the plant expansion necessary to implement the recommendations of this planning document. Additionally, there is not a commitment from West Goshen to accept the additional flows from the township.

Should West Goshen complete their planning and gain approval from DER to expand the plant, then this Department would support East Goshen's choice of the selected alternative. However, we still feel it should be necessary for the developers of the larger tracts of land to explore the possible use of spray irrigation when these areas are developed.

East Goshen Township should also take a proactive role in the management of the Willow Pond COLDS which is presently being operated by the homeowner's association. It is unclear in this report exactly what East Goshen is doing in regards to overseeing that this system is being properly operated. Additionally it appears the township misinterpreted the recommendations concerning this issue in our previous review. It is this Department's view that the township should become a partner in the operation of this community system. This does not necessarily mean that we feel it should be connected to the municipal sewerage system. In fact, with proper operation and maintenance this system may not need to be connect to the municipal system at all.

Should you have any questions concerning this review, please feel free to contact me at 344-6239 or the above address.

Sincerely,
Maria T. Goman

Maria T. Goman

Environmental Health Supervisor

cc: SMC Environmental Services Group
Chester County Planning Commission
PA Department of Environmental Resources
File (2)

THE COUNTY OF CHESTER

PLANNING COMMISSION
Government Services Center · Suite 270
601 Westtown Road
West Chester, PA 19382-4537

COMMISSIONERS
Joseph J. Kenna, Chairman
Karen L. Martynick
Andrew E. Dinniman

George W. Fasic, Executive Director

(610) 344-6285 · FAX: (610) 344-6515

August 19, 1994

Joseph M. McDonough, Chairman
East Goshen Township
Board of Supervisors
1580 Paoli Pike
West Chester, PA 19380

Re: Revisions to the Act 537 Sewage Facilities Plan Update

Dear Mr. McDonough:

The Chester County Planning Commission has completed its review of the above referenced revisions to the revised Sewage Facilities Plan of the Township as required by Act 537, the Pennsylvania Sewage Facilities Act. We offer the following comments for your consideration.

The County Planning Commission believes that the Township Board of Supervisors and their engineering consultant have adequately addressed, with a few minor exceptions, our comments of May 1993. Most notable are the Individual On-lot and Community On-lot System Management Ordinances adopted by the Township Board of Supervisors this past June. We commend you for committing to this program.

We believe that, while a considerable amount of time and effort have been devoted to this revised Plan, the Township will find itself in a difficult position if the "West Goshen Alternative" can not be implemented. The submittal of this Plan is premature in that is difficult see how PaDER could approve the Plan of East Goshen without first reviewing the Plan of West Goshen. Since your Plan is heavily dependent upon the plans and actions of West Goshen Township, it is better to wait until you are able to execute an agreement with West Goshen for the additional treatment plant capacity before submitting this Plan to PaDER. Alternately, East Goshen could wait to submit their plan until West Goshen has completed their Plan Update, and then submit both plans to PaDER together as a regional plan.

The revisions to the Plan Update as prepared are somewhat confusing. We feel this may be due to the fact that while the text of the Plan was modified, certain key graphic elements were not. It would very helpful to update the tables (Tables 3.6 and 3.7) which indicate the allocation of sewage flows from various areas in the Township to the two treatment facilities under the "West Goshen Alternative". Additionally, a map similar to Exhibit II which indicates the areas of the Township to be served by the facilities in the designated time frames should be included. This map could be keyed or coded to the areas listed in Tables 3.6 and 3.7, and would greatly clarify the intent of the Plan.

A third issue that the County Planning Commission feels should be clarified in the Plan is the overall priority for types of sewerage systems preferred by the Township to be used in new land developments. The third priority listed is "Public sewer connections where **feasible**". Some type of public sewer system is technically feasible in almost all areas. There may be cost, environmental, or other reasons that would make a public system **undesirable**; this distinction should be made in the Plan. We suggest this priority statement could be amended to state: "Public sewer connections in service areas described in this official municipal document".

Related to this issue is the selection of sewerage facilities for the two large undeveloped properties in the northeast section of the Township, the Woods and the Sherman properties. The Plan states that at the time of any development proposals for these properties the developers will first be **encouraged** to utilize community-type spray irrigation systems as the preferred alternative. We believe that the one way to "encourage" this is for the Township is to state, as part of the official Plan, the type of system desired and leave it to a developer to show that this type of system is not technically feasible on the property. Another method would be to amend the municipal zoning ordinance so that a density bonus could be granted the developer if this type of system is technically feasible and incorporated into the site design.

These comments are offered by staff prior to formal action by the Planning Commission. If the Commission should have additional comments on the revised Plan Update, their comments will be forwarded to you.

If you have any questions regarding this review, please call me at 344-6285.

Very truly yours,

George W. Fasic
Secretary

CC: Glenn Stinson, PaDER
Maria Goman, CC Health Department
Suzanne Fish, Township Director of Utility Administration
Frederick J. Turner, SMC Environmental Services Group

EAST GOSHEN TOWNSHIP
ACT 537 PLAN UPDATE

PLAN SUMMARY

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2. PLAN SUMMARY

A. Proposed Service Area and Major Problems Evaluated in this Plan

1. Chester Creek Watershed. Within the Chester Creek Watershed, all projects and properties depicted in Table 3.6, as contained on page 3-17, will be connected to the West Goshen Sewage Treatment Plant (STP). The one major subdivision of concern, the Charter Chase subdivision, was reevaluated in the field during 1993. As a result of the additional field survey, ten residential properties reflected current malfunctions out of a total of 98 dwelling units. It is the Township's conclusion that this subdivision can be adequately managed by the newly-adopted Sewage Management Program Ordinance for East Goshen Township without any connection to the public sewer system prior to the year 2002.

   Other reported, scattered malfunctions within the Chester Creek Watershed will be monitored under the newly-adopted Sewage Management Program Ordinance with mandatory three-year septic tank pumping cycles. In the event that the Charter Chase subdivision shows a need for public sewer connections after 2002, these units would be connected to the West Goshen STP.

   The New Kent Apartments, which is partially located within the Chester Creek Watershed, but which is currently connected to the Ridley Creek STP, will be shifted to the West Goshen STP during the period 1995-1996.

   In addition, East Goshen Township is now carefully evaluating the "West Goshen Alternative" which involves the potential availability of 780,000 gpd in additional treatment capacity at the West Goshen STP. As noted in the following section, the "West Goshen Alternative" has been selected for the Ridley Creek Watershed which in turn may cause additional connections to the West Goshen STP.

2. Ridley Creek Watershed. Within the Ridley Creek Watershed, all existing onlot systems and any future subdivisions developed with onlot systems will be managed under the Township's new Sewage Management Ordinance. The properties identified in Table 3-7 on page 3-20 of this Updated Act 537

Plan will continue to be considered for direct connection to the Ridley Creek STP.

The December 1992 draft of the East Goshen Act 537 Plan Update called for an expansion of the Ridley Creek STP from 0.4 MGD to 0.7 MGD. Based upon potential difficulties in such plant expansion with direct stream discharge to Ridley Creek, other alternatives have been evaluated including the possibility of a municipal spray irrigation system on nearby properties. Because of cost factors, potential wetland encroachment, and for other valid reasons, the municipal spray irrigation alternative is no longer considered viable since it is not cost effective and available land would require condemnation of a substantial estate.

A new alternative identified in this study as the "West Goshen Alternative" will involve a considerable number of changes to the Township's December 1992 draft Act 537 Plan Update. Specifically, if the Ridley Creek STP cannot be expanded as a stream discharge facility, then the following changes would occur:

- New Kent Apartments - transfer 84,420 gpd to the West Goshen STP

- The Immaculata College flow at 137,000 gpd, the William Henry Apartments at 96,000 gpd, and possibly the Bryn Mawr Rehabilitation Hospital at 40,000 gpd would all be transferred to the West Goshen STP <u>if</u> the West Goshen Municipal Authority accepts these facilities and if East Goshen agrees to construct the "pass-through" conveyance facilities. The balance of the properties identified as future problem areas as reflected in Table 3-7 would be handled at the Ridley Creek STP without creating an overload of this facility. It should be noted that Christ Memorial Lutheran Church, a previous requestor of sewage service, has indicated by way of a recent letter that such service is no longer required.

- In addition, regarding the SmithKline Beecham property, the future reservation for 55,000 gpd would be canceled and Beecham would be required to provide on-site sewage disposal for any future development extending

beyond the present 40,000 gpd which has been committed and paid by Beecham.

In summary, the current commitments to the Ridley Creek STP would be continued without the exclusions and transfers noted above. If the "West Goshen Alternative" is not capable of being executed for numerous reasons, then East Goshen Township must commence the socio-economic study immediately for the expansion of the Ridley Creek STP.

B. Selected Alternatives and Institutional Arrangements Required for the Chosen Alternatives

The wastewater alternatives chosen to solve the various problems within the Chester Creek Watershed and the Ridley Creek Watershed are identified below. The preferred priority of type of system to be used in both watersheds throughout East Goshen Township is as follows:

1. Individual onlot systems
2. Individual elevated sand mound systems
3. Public sewer connections where feasible
4. Community-type spray irrigation systems
5. Community-type in-ground disposal systems
6. Individual stream discharge systems
7. Retaining tanks

ALTERNATIVES CHOSEN FOR THE CHESTER CREEK WATERSHED

Charter Chase Subdivision

After further field work was conducted in 1993, it was determined that seven existing malfunctions and three graywater discharge violations out of 98 existing residential units did not warrant further pursuit at this time for public sewers. Charter Chase will remain with individual onlot systems throughout the 5-year and 10-year planning cycles. This subdivision will be carefully monitored under the newly-adopted Sewage Management Ordinance to assure that an increase in violations does not occur. Individual lot owners will be directed to correct malfunctioning systems. Future public sewer availability will be reserved at the West Goshen STP should it become necessary to connect this subdivision to public sewers after 2002.

For all remaining existing individual onlot systems, the Township's 1994 Sewage Management Ordinance will be utilized to constantly monitor such systems.

The remaining properties listed on Table 3-6 (reference page 3-16 of General Plan text) will be connected to the West Goshen STP generally in accordance with the time scheduled listed within said table.

New Kent Apartments

The 84,420 gpd now on-line at the Ridley Creek STP will be switched to the West Goshen STP when necessary to make additional capacity available at the Ridley Creek STP. This project sits on the ridge line and is partially in the Chester Creek Watershed and partially within the Ridley Creek Watershed.

Ridley Creek Watershed

The primary chosen alternative for the Ridley Creek Watershed is to execute the West Goshen Alternative for required sewage commitments and service areas which exceed the 0.4 MGD permit capacity at the Ridley Creek STP. The West Goshen Alternative will involve the construction of gravity conveyance systems to transport wastewater from East Whiteland Township to Greenhill Road and a new pumping station which will discharge to West Goshen and be treated at the West Goshen STP.

Facilities such as Immaculata College (137,000 gpd) and the William Henry Apartments (96,000 gpd) would be handled by such a conveyance system. The facilities would be located partially in East Whiteland Township and fall within the Act 537 responsibility of that Township to work jointly with East Goshen should these conveyance facilities be required. West Goshen Township will require a binding sewer services agreement with East Whiteland prior to the design of such facilities.

On June 8, 1994, the Christ Memorial Lutheran Church and School located on Line Road indicated in a letter to the East Goshen Township Manager that they have solved their problem and they are not interested in public sewer connections at this time. Recent letters directed to the Bryn Mawr Rehabilitation Hospital regarding their continued interest in connecting 40,000 gpd to the East Goshen system have not been answered. If the Bryn Mawr Rehabilitation Hospital decides later to connect with the East Goshen system, either a method of conveying to West Goshen will be considered or a reevaluation of connecting at the Ridley Creek plant will be made.

SmithKline Beecham

Beecham has purchased and paid for 40,000 gpd at the Ridley Creek plant which will be reserved for that property. The 55,000 gpd listed in Table 3.7 of the General Plan (refer to page 3-20) will now be removed from further consideration. Beecham has demonstrated the ability to handle additional wastewater discharge within its property limits, possibly utilizing spray irrigation. Beecham has indicated no development is contemplated until well after the year 2000.

The Woods Property/Sherman Property

When the Woods property (86 acres) and the Sherman property (38 acres) are developed, the developers of these properties will be directed to explore community-type systems utilizing spray irrigation which might be possible because of the sizable acreage related to each site. If community-type systems cannot be approved for these properties, the need for the Line Road interceptor will be instituted by the Township which would connect the Woods/Sherman properties and the Willow Pond community system to the Ridley Creek STP. The reservations for wastewater treatment will continue to be shown at the Ridley Creek STP in accordance with Table 3.7 to assure that these sites are not denied access to public sewers.

All other property subdivisions and facilities listed in Table 3.7 will be connected to the Ridley Creek STP.

Reduction in EDU Ratings for both Chester Creek and Ridley Creek Watersheds

East Goshen Township will immediately commence to use the following new EDU wastewater flow generation standards for residential units which are much closer to "actual" rather than continuing the use of "theoretical" EDU flow rates which distort estimated flows at both the West Goshen STP and the Ridley Creek STP:

Single-family detached dwellings -	275 gpd
Townhouses or townhomes -	225 gpd
Apartments -	200 gpd

C. Cost of Implementing the Proposed Alternatives

Table 5.1 (refer to page 5-12 of General Plan text) lists and discusses all costs related to providing public sewer facilities discussed under this report.

When and if applicable, the cost of connecting the Charter Chase community to the public sewers via a gravity collection system and a force main is estimated at $925,000.

Appropriate construction costs only are also shown for future connections for the Mill Valley subdivision and the Millstream subdivision. The construction cost for the Line Road interceptor is estimated at $395,000 to eventually connect Willow Pond/Woods property/Sherman property to the Ridley Creek STP.

The Township conducted an alternative analysis for spray irrigation related to the treatment costs for the additional 0.3 MGD at the Ridley Creek STP in lieu of stream discharge for the additional effluent. The resulting estimated cost of $5,125,000 (in excess of $17/per gallon) was deemed far too expensive to be considered further. In addition, the use of the Grace Estate would involve partial and probable total condemnation driving the cost to even higher levels per gallon of wastewater treated.

Estimated Costs for the West Goshen Alternative

East Goshen Township has decided not to spend substantial dollars in designing a collection system for potential customers located in East Whiteland Township. Specifically, to service the Immaculata College facilities and the William Henry Apartments would require a gravity sewer extending from King Road to Hersheys Mill Road at a nominal estimated cost of $614,000. In addition, a pumping station located at Greenhill Road and Hersheys Mill Road with a force main extending approximately 10,000 linear feet into West Goshen would cost an additional $804,000 to $1,074,000. In summary, a conveyance system to service two external facilities having daily wastewater flows of 233,000 gpd would cost between $1,418,000 to $1,688,000. This cost would represent the conveyance cost only. In addition, the treatment cost would require negotiation with West Goshen Township, and it is estimated that such cost will range between $5 to $6/gallon of wastewater treated. These tentative estimated costs may prove to be too costly for these external facilities.

Any user fees related to the West Goshen Alternative would be borne solely by the users, i.e., Immaculata College and the William Henry Apartments. The only East Goshen subdivision which could possibly be served by a gravity sewer for these external users would be the Millstream Drive residential area containing

25 EDUs. It would be more cost effective to connect the Millstream Drive units to nearby existing gravity sewers.

There is no estimated cost for switching the New Kent Apartments from the Ridley Creek STP to the West Goshen STP since these connections already exist.

D. Municipal Commitments Necessary for Plan Implementation

The first major commitment has been made by the adoption of the 1994 Municipal Sewage Management Ordinance which was adopted on June 7, 1994. This Ordinance will adequately control existing and future individual onlot and community-type systems within East Goshen Township.

The next major municipal commitment required is to enter negotiations with West Goshen Township regarding the "West Goshen Alternative." To date, East Goshen Township has officially responded to West Goshen Township by requesting the entirety of 780,000 gpd in possible available capacity. As of June 1994, no official response had been received from West Goshen Township. New agreements must be arranged including all cost factors related to expansion of the West Goshen STP. East Goshen Township is prepared to commence these negotiations during 1994.

E. Schedule for Implementation

1. Adopt Township-Wide Sewage Management Ordinance - Completed June 7, 1994 and now in effect.

2. Enter negotiations with West Goshen Township to implement the "West Goshen Alternative" - estimated date September 1994.

3. Switch New Kent Apartments from Ridley Creek STP to West Goshen STP - estimated target date Fall 1995.

4. Conduct additional walk-through inspections on a property-by-property basis within the Charter Chase subdivision during the spring of 1996 and 1998.

F. Future Initiation of Feasibility Evaluation

Evaluate the need for the Line Road Interceptor and authorize further studies during 1997-1998, or at the time of any development proposal for the Woods property and/or Sherman property. (The developers of the Woods property and/or Sherman property will first be encouraged to utilize community-type spray irrigation as a preferred alternative to connecting with the Ridley Creek STP.)

Reevaluate the Possibility of Connecting the Bryn Mawr Rehabilitation Hospital to the Ridley Creek STP in 1998 should this Willistown Township facility express a need for such connection, and if capacity is available.

3. RESOLUTION OF ADOPTION BY EAST GOSHEN TOWNSHIP

This resolution is now being prepared for Board of Supervisors' approval and incorporation on the following page.

4. TOWNSHIP EVALUATION OF COMMENTS BY COUNTY AGENCIES AND ADJACENT MUNICIPALITIES

East Goshen Township has responded to the best of its ability to the Municipal and County Agency review letters which are attached in Section 6 below. Specifically, Willistown Township requested that further consideration be given to spray irrigation and to elimination of any additional discharge to Ridley Creek. The Township has accomplished this request by all of the foregoing changes to the December 1992 Act 537 Plan Update.

East Whiteland Township requested consideration for serving Immaculata College, the William Henry Apartments, and other nearby facilities. The West Goshen Alternative is the response to this request.

With respect to the Chester County Health Department review letter dated April 15, 1993, the Township has responded as follows:

a) The County suggested an additional walk-through evaluation of the Charter Chase community. This was accomplished and the actual results depict little if any need for providing public sewers at this time.

Charter Chase will be constantly monitored under the 1994 Sewage Management Ordinance. In addition, the details requested by the Health Department regarding the Township-wide onlot management program are clearly expressed in the adopted Ordinance No. 105, enclosed herein.

b) It is the Township's position that they will not take over the Willow Pond community system until the newly-constructed system exhibits that it cannot be successfully operated as a community in-ground system. The Township engineer and Municipal Authority engineer are constantly advised of the status of this privately-operated system and this is sufficient for the time being. It is the Township's position that the construction cost of the Line Road Interceptor cannot be justified solely on the basis of taking over the Willow Pond community system. This community, located partly in Willistown Township, will continue to be monitored annually. The new community Sewage Management Ordinance also addresses COLDS responsibilities on the part of the Township. This Ordinance and other legal documentation will allow a takeover at any time deemed necessary by East Goshen Township.

c) With respect to the social and economic justification for the increased discharge at the Ridley Creek STP, East Goshen Township believes that this is not necessary if the West Goshen Alternative is pursued and approved.

With respect to the Chester County Planning Commission comments as expressed in a letter dated May 10, 1993, the following response comments are considered appropriate:

a) As noted above, the Township will not conduct the social and economic justification study for the Ridley Creek STP expansion at this time. This will be done only if the West Goshen Alternative is not capable of implementation and the Township is forced to return to its former primary alternative of expanding the Ridley Creek STP as a stream discharge facility. This is not likely.

b) The goals and action plans of East Goshen Township are clearly expressed in this Plan Summary and the various amendments to the appropriate sections of the General Plan.

c) This Plan Summary states the Township's position with respect to the use of various types of systems and the preferred ranking order for use of those systems.

d) The individual onlot System Management Ordinance and the COLDS Management Ordinance has been adopted by way of Ordinance No. 105 dated June 7, 1994.

e) The table of contents has been expanded to add a list of figures, exhibits, and tables. In addition, Exhibit 2 in the General Plan was not revised since this was an historical document developed from a prior Act 537 Plan Update. The Ashbridge Firethorne (170 EDUs) is appropriately as shown in Table 3.6 as being on-line and "pumped" from Ridley Creek to the West Goshen STP (refer to page 3-17).

f) The Township appreciates the advice of the County Planning Commission regarding the proportion of wastewater being applied to the ground water system. It must be recognized that the entirety of the Hersheys Mill Village and the Lockwood Chase subdivision currently utilize spray irrigation. In addition, the Willow Pond community utilizes a community in-ground system which is currently functioning. The Township's adopted preference for future subdivisions relies on a number one priority for individual onlot systems, where feasible. Many new subdivisions in future years will be built utilizing such systems. In addition, the Township has expressed a preference for community-type spray irrigation systems for the Woods property and the Sherman property as a first alternative followed by a second preferred alternative (a connection to the public sewers).

g) East Goshen Township is aware of the inter-basin transfer of wastewater. Since a predominant part of the Township is serviced by the Philadelphia Suburban Water Company and the West Chester Area Municipal Authority, a concern over the inter-basin transfers of wastewater may not be difficult to achieve. There may be some future concern on the part of DRBC with respect to transferring the Immaculata College wastewater flow (137,000 gpd) from Valley Creek to Chester Creek. This concern will have to be addressed by East Whiteland Township as the responsible party.

h) The external facilities in East Whiteland and Willistown Townships have been thoroughly evaluated. The Township has communicated (in writing) with Immaculata College, the William Henry Apartment owners or operators, the Christ Memorial Lutheran Church, and

the Bryn Mawr Rehabilitation Hospital. Only the Christ Memorial Lutheran Church has responded indicating no further needs.

i) The Township has thoroughly evaluated the possibility of designing a municipal spray irrigation alternative for the 0.3 MGD in additional capacity originally determined as being necessary for the Ridley Creek STP. This alternative would have involved in excess of $5,000,000 in cost and the possible condemnation of a major parcel within the Township. The extent of wetland intrusions and the high estimated condemnation cost for part or all of this parcel led to a determination that municipal spray irrigation is not feasible.

In addition, an analysis was made to utilize a part of the Beecham property. The extraordinary conveyance cost and purchase cost for land dictated that this alternative could not be made cost effective.

Further, the Township has prioritized the Woods and Sherman properties as an expressed first alternative for community-type spray irrigation before any possible connection to the public sewer system could be made.

j) The Township has fully and thoroughly explored the Hersheys Mill spray irrigation system including its operating, maintenance, and capital budgets and its management system. While it might be desirable ten years hence to utilize any remaining capacity at this facility, it is the Township's position that this is a well-managed, well-operated facility which needs no Township interference at this point. In summary, the Township believes it has fully responded to the County Planning Commission comment.

5. PROOF OF PUBLIC NOTICE

Attached is a copy of the public notice originally advertised in the Chester County Daily Local news for public comment regarding this plan.

6. WRITTEN COMMENTS RECEIVED FROM COUNTY REVIEW AGENCIES AND ADJACENT MUNICIPALITIES

Attached hereto are each of the comments received from West Goshen Township, Willistown Township, Westtown Township, East Whiteland Township, the Chester County Health Department, and the Chester County Planning Commission. These letters are all attached in this section.

7. PROJECT IMPLEMENTATION SCHEDULE

The Township's project implementation schedule is appropriately covered in Sections 2.E and 2.F above.

8. PROJECT IMPLEMENTATION ORDINANCES

Attached following this page is the "Sewage Management Program Ordinance for East Goshen Township" adopted June 7, 1994.

9. REVIEW AGENCY RESPONSES

Attached hereto are the updated Chester County Health Department and the Chester County Planning Commission response letters regarding revisions and amendments to this Updated Act 537 Plan. (To be added when received.)

EAST GOSHEN TOWNSHIP
ACT 537 - SEWAGE FACILITIES PLAN UPDATE
DEC. 1992
REVISED JUNE 1994

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1.0 INTRODUCTION AND PHYSICAL DESCRIPTION OF PLANNING AREA AND DEMOGRAPHICS

1.1 Introduction and Political and Planning Area Boundaries

East Goshen Township has a long history of sewage facilities planning. At the time of publication of the Chester County Master Sewer Plan dated September 1970, as prepared by Roy F. Weston Environmental Scientists and Engineers, East Goshen Township was treated almost solely as a contributor to the West Goshen Regional Sewage Treatment Plant.

The County Sewer Master Plan reported in 1968 that 500 persons were being served by a private treatment facility which was in the process of being phased out with anticipated connections to the West Goshen STP. The County study further projected that by 1978, East Goshen Township would have 6,500 persons serviced by the West Goshen facility with an estimated flow of 650,000 gpd. The study further projected that by 1988 12,600 persons would be served requiring 1.26 MGD at the West Goshen facility. Ultimately, East Goshen Township received only 1.0 MGD in its agreement with West Goshen Township. The County study proposed to serve most areas within the Chester Creek Watershed by gravity connections and pumping to the West Goshen system. The study also showed a proposed 16-inch interceptor extending along Ridley Creek to a major pumping station located on Ridley Creek just below Strasburg Road and east of Dutton Mill Road with a force main extending back to Reservoir Road.

Appropriate references to East Goshen's sewage needs are contained on page 53 of the County study, and graphics depicting the service area are listed under the "West Chester Area Existing and Proposed Sewage Systems."

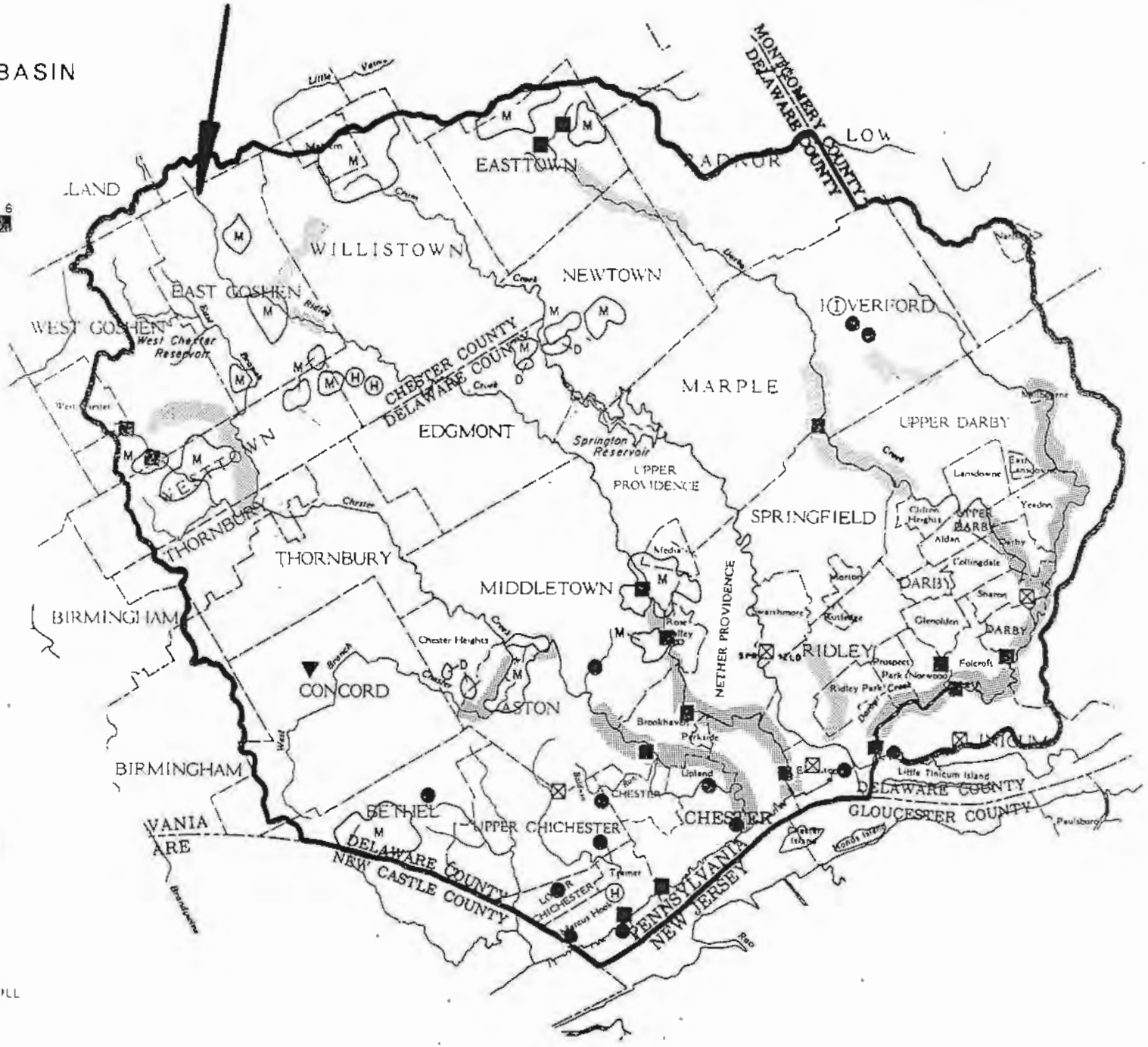
COWAMP/208 WATER QUALITY MANAGEMENT PLAN

The COWAMP/208 Regional Water Quality Management Plan was published by the Delaware Valley Regional Planning Commission on April 30, 1978. This regional study treated both East Goshen and West Goshen Townships as a part of the Delaware County Subbasin. Figure J18, as extracted from the COWAMP study shows four major areas of East Goshen Township with reported major areas of septic tank malfunctions and one area of surface water quality problems adjacent to Ridley Creek. This figure is reproduced on the following page for historical purposes.

Figure J-1B

DELAWARE COUNTY SUB-BASIN

SEPTEMBER, '977



LEGEND

- SURFACE WATER QUALITY PROBLEM AREAS
- MUNICIPAL DISCHARGE
- INDUSTRIAL DISCHARGE
- (M) KNOWN AREAS OF SEPTIC TANK MALFUNCTION
- (D) SEPTIC TANK CRITICAL DENSITY AREAS
- LAGOON
- SANITARY LANDFILL
- (I) INDUSTRIAL GROUNDWATER DISCHARGE OR SPILL
- (H) HYDROCARBON SPILL

The only other relevant reference to East Goshen Township appears in Appendix Table D-2 which lists East Goshen Township as being a contributor to the West Goshen STP. There is no breakdown for the East Goshen contribution to the West Goshen system.

One other reference which appears on Appendix Table C-3 of the COWAMP study includes East Goshen Township as being a part of the 31,743 persons to be served by the West Goshen STP with a rated sewage flow of 4.045 MGD. In summary, the COWAMP/208 study did not specifically call out the water quality management needs for East Goshen Township.

1978 WASTEWATER FACILITY PLANNING STUDY

The first major effort at local wastewater planning was completed in 1978. The purpose of this study was to develop and initiate an environmental monitoring program within the Ridley Creek Watershed in anticipation of the design and construction of a Ridley Creek wastewater facility.

1981 REVISED SEWAGE FACILITIES PLAN FOR EAST GOSHEN TOWNSHIP

In March 1981, the Township published first a comprehensive major update of the Act 537 Plan which was prepared by Walter B. Satterthwaite Associates, Inc. The 1981 study followed closely on the heels of a study identified as the Ridley Creek Sewerage Study prepared by Yerkes Associates, Inc., in 1980. The Satterthwaite plan, which is cited frequently in this 1992 update, concentrated on a prime objective in developing and evaluating alternative wastewater treatment approaches for the Ridley Creek Watershed. The 1981 study concentrated on sewage service for the following areas:

- Ashbridge Firethorne Area
- Vista Farms
- Highland-Taylor Area
- Warrior-Raewyck Area
- Boot Road and Route 352
- Township Building and Elementary School
- New Kent Apartments
- Colonial and Cornwallis Drive Areas
- Meadowbrook Drive Area

The 1981 Act 537 Plan Update also contained extensive discussion of low pressure grinder pump installations. The primary areas resolved as a result of the 1981 update study included resolutions for the Ashbridge Firethorne area, the Vista Farms area, and the Elementary School property.

1985 ACT 537 REVISION

Another revision to the Township's Act 537 Plan was concluded in November 1985 as prepared by Yerkes Associates. This particular update noted that the Ridley Creek Treatment Plant was about to be placed on line in August 1985 and addressed the following subdivisions or facilities in the Township which were to be served by the new Ridley Creek system:

- Bow Tree Farms Subdivision - 460 single family units
- Smith-Kline-Beckman (now Beecham) - 40,000 gpd
- Vista Farms
- Ashbridge Firethorne Area
- Hunt Country Subdivision
- Albrecht Land (under study)
- Elementary School Site

The 1985 study also contained references to the following community on-site systems:

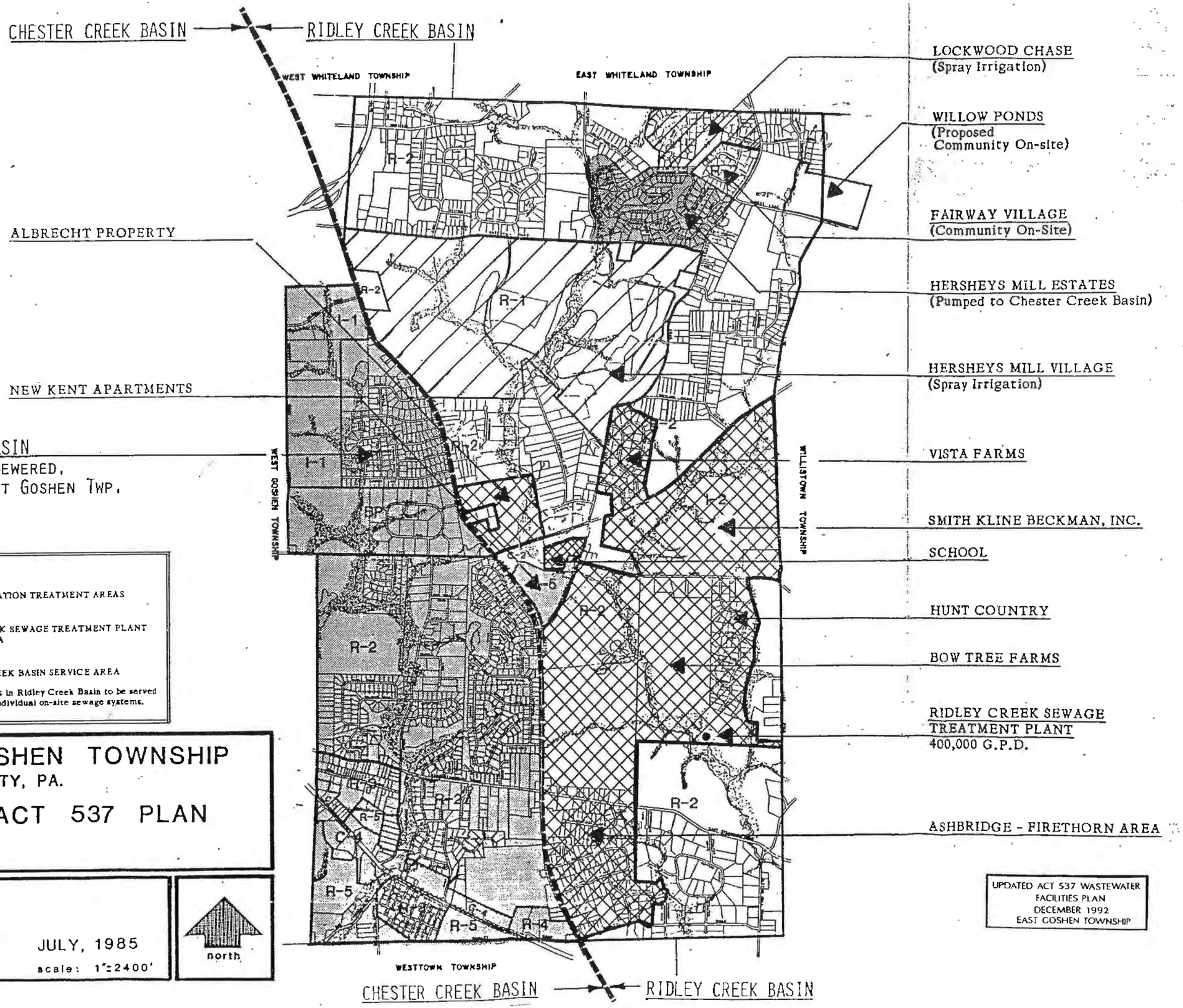
- Hersheys Mill Village
- Lockwood Chase Subdivision
- Fairway Village Subdivision
- The Willow Ponds Subdivision

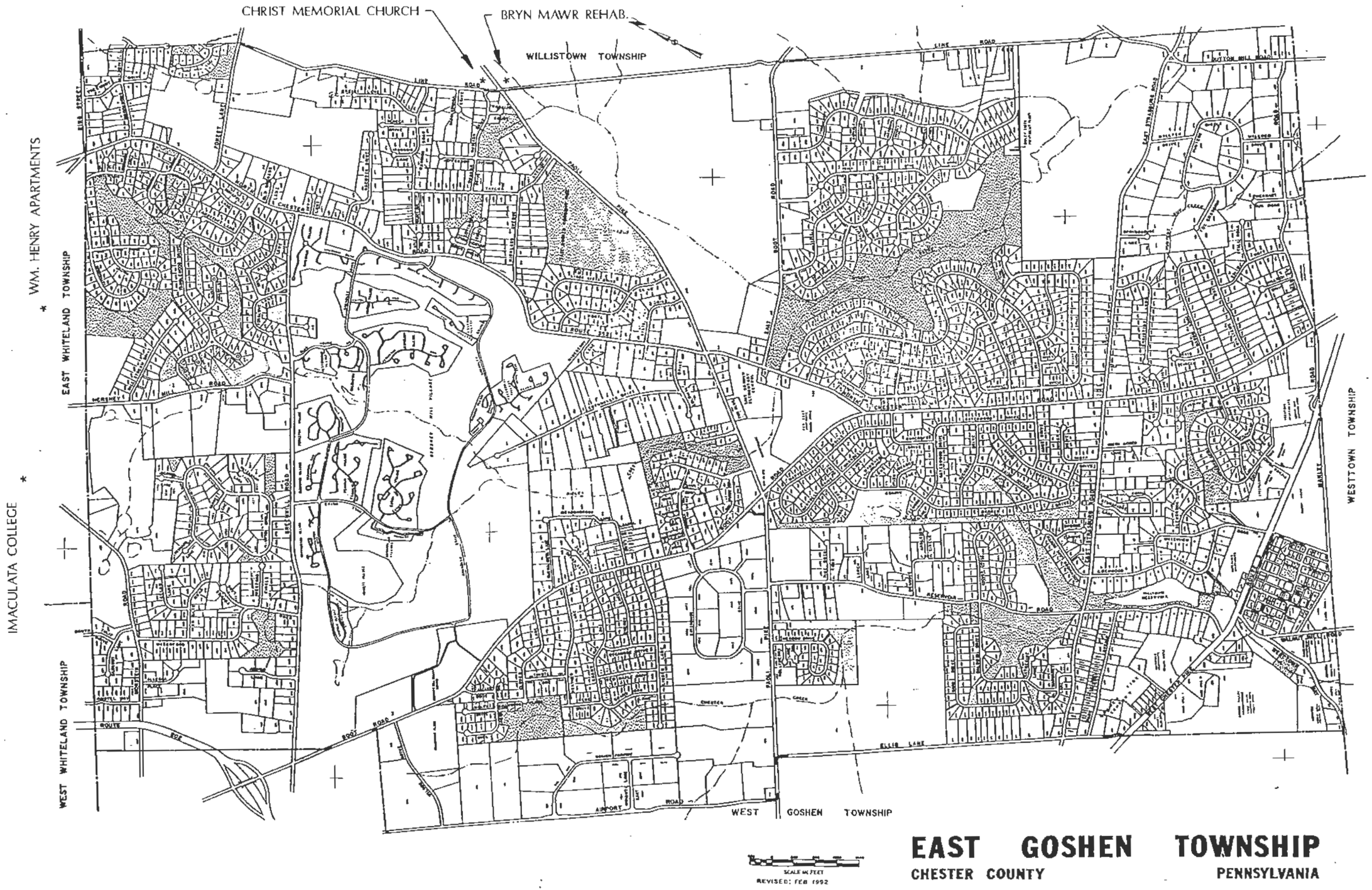
The 1985 Act 537 Plan Update also discussed several miscellaneous sewage systems including the New Kent Apartments (90,000 gpd) and the Hersheys Mill Estates development comprising 143 units under construction. At the time of this report (November 1985), the Hersheys Mill Estates area was in the process of being connected to a new pump station and force main connected to the West Goshen system.

Attached following this page is an exhibit prepared by Yerkes Associates in July 1985 which summarized sewage facilities planning considerations through that data. This exhibit is also discussed in several sections of this Plan.

POLITICAL AND PLANNING AREA BOUNDARIES FOR THE 1992 ACT 537 PLAN UPDATE

Following this page is Exhibit 1 (which has been updated through February 1992) reflecting the political and planning area boundaries for areas discussed in this 1992 update of the Act 537 Plan. Sections 3.3 through 3.5 of this report discuss certain areas which are external to East Goshen Township and are discussed for possible inclusion for sewage treatment by East Goshen Township at the Ridley Creek Treatment Plant. These additional facilities are located on the periphery of the East Goshen Municipal boundaries. This plan update discusses expansion of the Ridley Creek Treatment Plant and other


CHESTER CREEK BASIN
RIDLEY CREEK BASIN
WEST WHITELAND TOWNSHIP
EAST WHITELAND TOWNSHIP
LOCKWOOD CHASE
(Spray Irrigation)
WILLOW PONDS
(Proposed
Community On-site)
FAIRWAY VILLAGE
(Community On-Site)
HERSHEYS MILL ESTATES
(Pumped to Chester Creek Basin)
HERSHEYS MILL VILLAGE
(Spray Irrigation)
VISTA FARMS
SMITH KLINE BECKMAN, INC.
SCHOOL
HUNT COUNTRY
BOW TREE FARMS
RIDLEY CREEK SEWAGE
TREATMENT PLANT
400,000 G.P.D.
ASHBRIDGE - FIRETHORN AREA
ALBRECHT PROPERTY
NEW KENT APARTMENTS
CHESTER CREEK BASIN
AREA PRESENTLY SEWERED,
TREATMENT BY WEST GOSHEN TWP.
WEST GOSHEN TOWNSHIP
WILLISTOWN TOWNSHIP
WESTTOWN TOWNSHIP
R-1
R-2
R-4
R-5
I-1
I-2
C-2
C-4
BP
LEGEND
SPRAY IRRIGATION TREATMENT AREAS
RIDLEY CREEK SEWAGE TREATMENT PLANT SERVICE AREA
CHESTER CREEK BASIN SERVICE AREA
Note: Other non-designated areas in Ridley Creek Basin to be served by community on-site or individual on-site sewage systems.
EAST GOSHEN TOWNSHIP
CHESTER COUNTY, PA.
REVISED ACT 537 PLAN
EXHIBIT II
YERKES ASSOCIATES, INC.
101 CHARLES DRIVE
BRYN MAWR • PA.
CONSULTING ENGINEERS
SITE PLANNERS
JULY, 1985
scale: 1"=2400'
north
UPDATED ACT 537 WASTEWATER
FACILITIES PLAN
DECEMBER 1992
EAST GOSHEN TOWNSHIP



EXISTING DEVELOPMENT - 1992/PLANNING AREA BOUNDARIES

EXHIBIT 1

alternatives to accommodate new Township growth and existing problem areas located on the periphery of the Township boundaries.

For example, consideration is being given for the possible inclusion of sewage flow from the Bryn Mawr Rehabilitation Hospital located in Willistown Township. Other external facilities located in East Whiteland Township, which are being considered under this plan, include the William Henry Apartments and portions of the Immaculata College Complex.

1.2 Physical Characteristics of Planning Area

East Goshen Township, in late 1992, is approaching the point wherein reasonably accurate build-out forecasts can be made. A new updated Comprehensive Plan for the Township was adopted in October 1992 and reflects in Appendix Table A-1 that 67 percent of the land area within the Township is developed, another 12 percent is committed for development, and only 21 percent of the remaining area of the Township (1,321 acres) remains for future development. More than half of this remaining undeveloped 1,321 acres is expected to be developed during the time frame of this Act 537 Plan Update (1993 to 2002).

Two of the exhibits contained in the preceding section clearly identify the physical characteristics of the planning area comprising all of East Goshen Township. First, the 1985 exhibit prepared by Yerkes Associates clearly shows how the Township is divided into the Chester Creek Watershed and the Ridley Creek Watershed including the respective streams and natural conveyance channels. The 1992 updated development plan for the Township also contained in Section 1.1 shows the extent of development through early 1992. In addition, the Natural Areas and Constraints to Development Exhibit published as page 26 of the new 1992 Comprehensive Plan clearly depicts all remaining areas of the Township which are subject to major development constraints including floodplain areas, areas containing alluvial soils, the areas of the Township which are subject to steep slopes, and the major woodlands.

There are two water bodies located within the Township, including the Township owned Reservoir Road recreation facility comprising approximately seven acres. This facility is located south of Strasburg Road and north of West Chester Pike and is not impacted in any way by this Act 537 Plan Update. The other former water body (now drained) is located on the Grace Estate property and is situated north of Strasburg Road and west of Line Road. There are other smaller water bodies within the Township including farm ponds and small privately-owned ponds similar to the facility owned by the Charter Chase community located west of Waterford Road and to the west of Wexford Circle.

NATURAL AREAS & CONSTRAINTS TO DEVELOPMENT

FLOOD PLAIN AREAS

ALLUVIAL SOILS

STEEP SLOPES (15% AND OVER)

WOODLANDS

EAST GOSHEN TOWNSHIP
CHESTER COUNTY, PENNSYLVANIA

COMPREHENSIVE PLAN

0 800 1600 2400 4000
SCALE IN FEET

NORTH

Thomas Comitta Associates, Inc.
Planning & Design Consultants

EXHIBIT 1A

None of the farm pond and privately owned water facilities will be impacted by this Act 537 Plan Update.

These physical characteristics are all acknowledged in the new 1992 Comprehensive Plan which serves as the basis for regulatory controls adopted in the Township Zoning Ordinance and the Township Subdivision and Land Development Ordinance. It is estimated that 35 percent of the remaining undeveloped land in the Township (1,321 acres) will be subject to such natural constraints as floodplains, wetlands, areas containing alluvial soils or soils with high seasonal ground water, and areas of steep slopes. Thus, it is estimated that of the remaining undeveloped ground within the Township only about 860 acres will be subject to any form of new development as controlled by present zoning.

1.3 Description of Geology and Soils Within the Planning Area

The March 1, 1981 Act 537 Plan Revision contained an excellent description of the Township geology and the Township soils characteristics. This information prepared by Satterthwaite Associates is still relevant and is incorporated herein. In addition, Exhibit 2 depicting the detailed soils classification for the entire Township has been prepared and incorporated on the following page. The following descriptions of the existing geology and existing soils are credited to Walter B. Satterthwaite Associates.

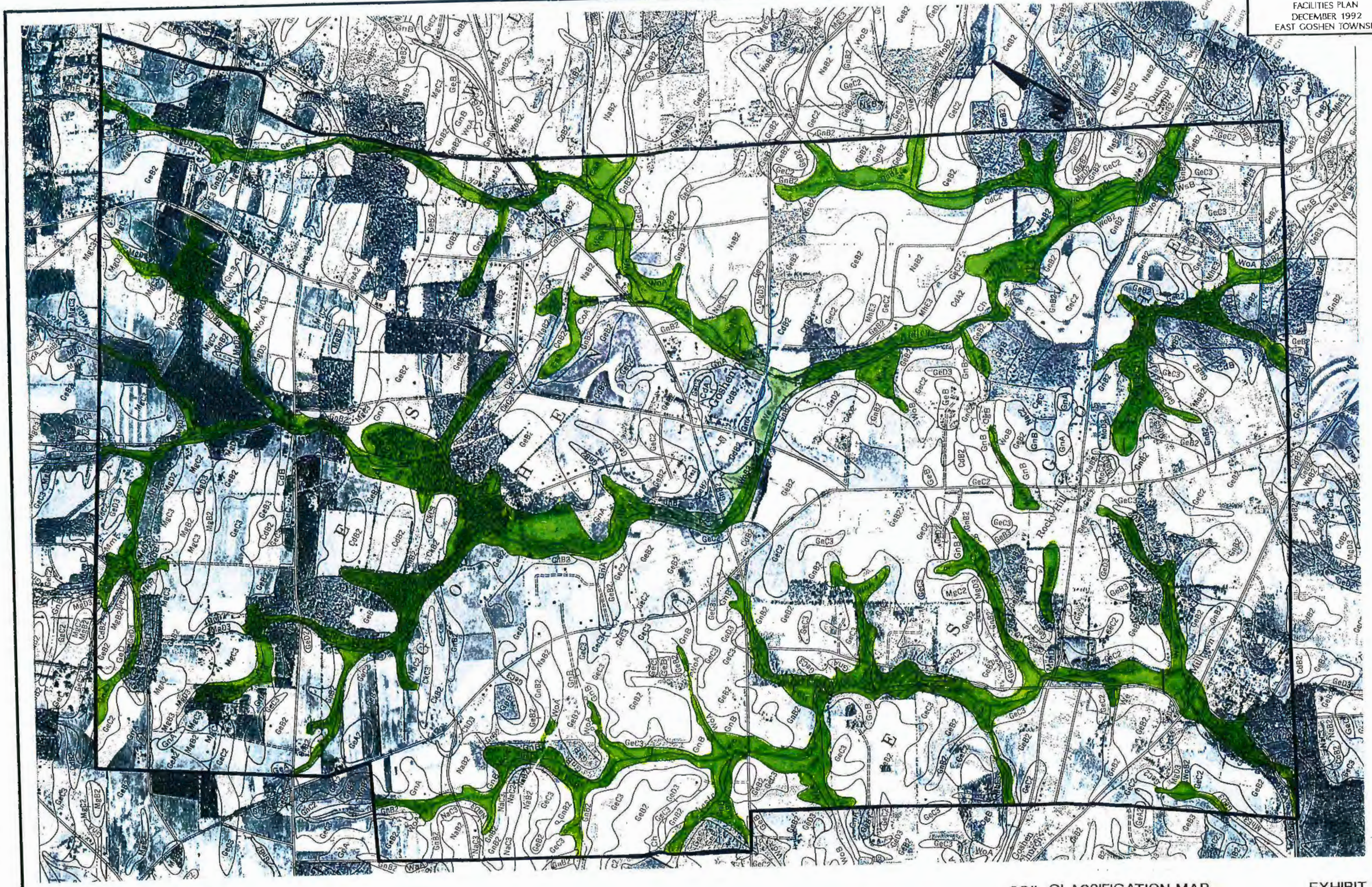
TOWNSHIP GEOLOGY

East Goshen Township is underlain by a series of igneous and metamorphic rocks which are pre-existing rocks (sedimentary and igneous) which have been altered by exposure to intense heat and pressure. Igneous rocks are formed under high temperature and pressure in a molten or partially molten state. All of these rocks have been deeply weathered and dissected by streams to form a generally rolling topography.

There are five different rock formations in the Township: Gabbro, Gabbroic Gneiss, Serpentine, Peters Creek Schist, and the Wissahickon Schist. There is also a small area consisting of Matadiabase/Pegmatite dike within the Township.

Most of the southern portion of the Township is underlain by gabbroic gneiss and gabbro. Gabbro is a medium grained igneous rock with a high percentage of dark minerals giving the stone an overall gray to black color. Gabbroic gneiss is distinctly marked by alternating light and dark bands. This formation covers the entire width of the Township and extends northward to a point above Cornwallis Drive where a discontinuous band of

UPDATED ACT 537 WASTEWATER
FACILITIES PLAN
DECEMBER 1992
EAST GOSHEN TOWNSHIP



HYDRIC SOILS

SOIL CLASSIFICATION MAP

EXHIBIT 2

Serpentine rock crosses the length of the Township in an east-west direction.

Serpentine is a fibrous to massive magnesium rich igneous rock. This rock is easily identified by its dark to light green color. This formation has been intruded along a fault trending in the same direction across the Township, and occurs as ridges which form minor topographic highs. Associated with the Serpentine formation are two dikes or intrusive layers of rock. One dike is pegmatite, the other a metadiabase. In the Township, these dikes are very narrow and of limited length.

Extending northward above the Serpentine ridge is a metamorphic series of rocks consisting of two phases of the Wissahickon schist. The mica phase occupies the area just north of the Serpentine ridge and is comprised of schist and gneiss of bluish-gray to gray color. A schist is a well-foliated metamorphic rock with visible mica (muscovite), a thin clear shiny sheet-like mineral.

The second phase of the Wissahickon formation, the chlorite phase, occupies the very northern and northwest corners of the Township. The chlorite phase, containing phyllite and schist, appears as a bluish or greenish gray rock with a satiny luster produced by the minerals chlorite and mica.

The rocks in the Township have been deeply weathered and altered from their original character. Although the structural geology of the Township is complex, there are several important factors that should be reviewed. The major bedding planes and foliations are oriented in an east-west to northeast-southwest direction. While major joint sets are oriented in the same direction as bedding and/or foliation, a secondary joint set extends nearly perpendicular to bedding. These joints (secondary openings) dip at nearly vertical angles extending to the base of the weathered zone. Each of the rock types are structural conditions resulting in a variable surface expression which can be observed in East Goshen Township.

Soils in East Goshen Township

While many soil series exist in nature, the rates and patterns of soil development are all dependent on a number of interrelated factors which include parent materials, climate, organisms/vegetation, and relief.

The mineralogical composition of the soil profiles or its soil texture is directly related to the parent material that underlies the soil, as well as how easily this material weathers or breaks down. For example, in East Goshen Township the unaltered igneous rocks of gabbro, quartz, and serpentine weather down to form silt loams and silty clay loams. The metamorphoses

rocks consisting mostly of schist and gneiss, form thick silt loam profiles, usually five to ten feet or greater. Finally, the materials laid down along streams are geologically recent alluvial deposits. They are usually deep soils that show very little profile development.

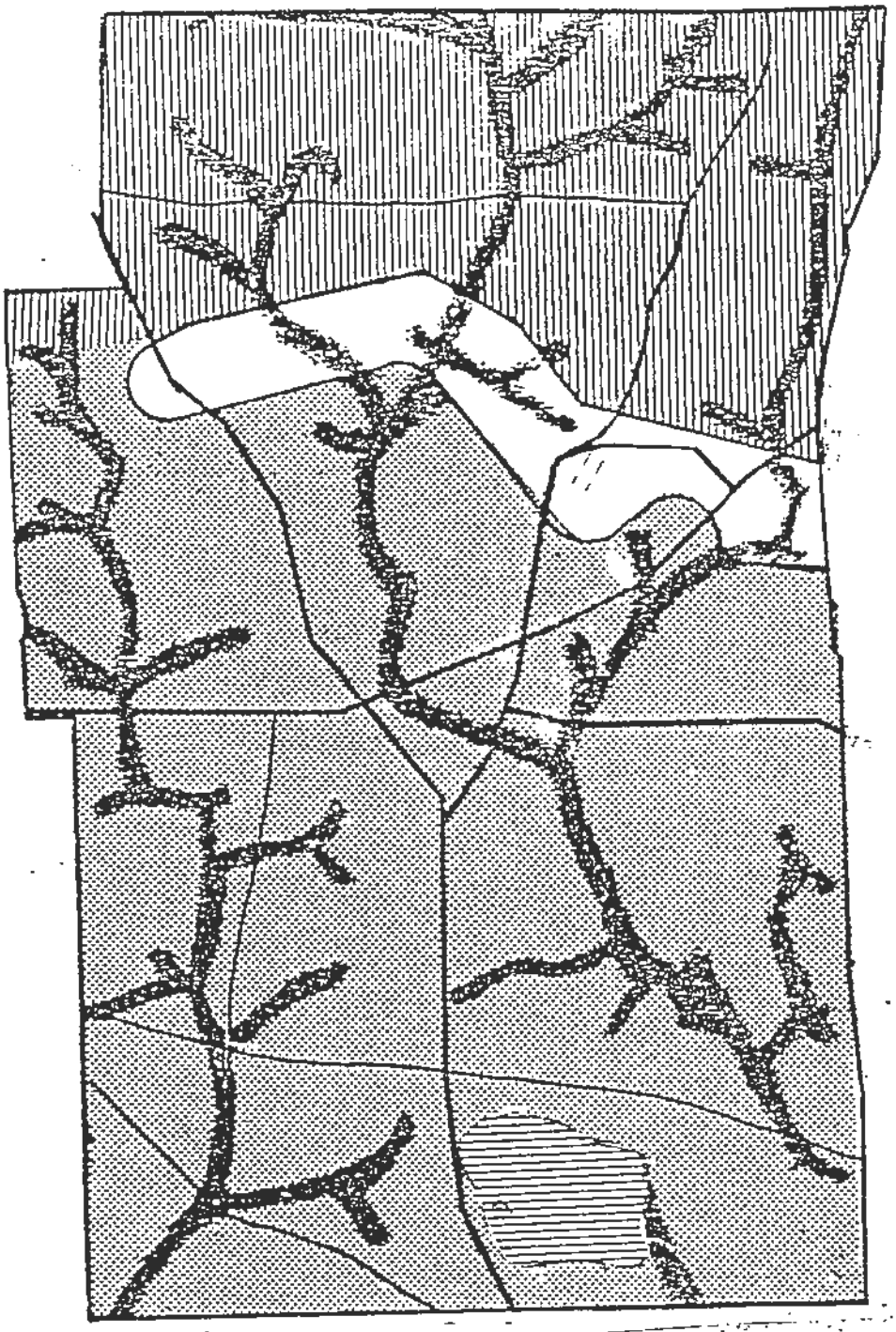
An influential factor regarding soil development is climate. Chester County has a humid temperature climate with an average annual temperature of 50°F and 46 inches of precipitation. Soils in this area are generally moist with seasonal variations. Temperature and precipitation have the ability to alter the physical and chemical weathering processes of the parent materials. The accumulation of organic matter also is affected by climate. Where low temperatures and high moisture percentage occur, the organic matter content is increased. As an example, soils formed under a forest cover have a more defined horizon development than soils formed under a grass cover. Also, they have only half as much organic matter content, are more acidic, and have more downward movement of clay particles.

The relief of slope of the land governs the direction and rate of water moving through the soil profile. This, in turn, affects soil drainage characteristics, soil weathering, soil depth, and a leaching of soil minerals.

In East Goshen Township, the soils on gentle slopes are considered to be mature and old because of their stabilized state, thick organic layer, and heavy clay movement down through the profile. In contrast, the floodplain soils and soils located on steep slopes are considered young because they have not yet developed well-drained profiles.

The above factors interact in varying degrees to produce different soils with different final characteristics. The present soil conditions have been summarized on Figure 2.

To identify the soils in any area, a soil association map is generally used as a preliminary guide. A soil association represents a grouping of a few major soils found in particular locations and is then named after the most prevalent soil series. The soils in an association are generally weathered from the same type of underlying materials, and therefore, their soil textures may be similar due to their characteristics concerning depth, stoniness, and natural drainage. The soils found in East Goshen Township can be classified into four soil associations: 70 percent as Neshaminy-Glenelg Association, 25 percent as Glenelg-Manor-Chester Association, and 5 percent as the Neshaminy-Chrome-Conowingo Association, and Montaldo-Watshung-Mount Lucas Association combined (see Figure 2).



Glenelg-Manor-Chester Association

Neshaminy-Chrome-Conowingo Association

Neshaminy-Glenelg Association

Montalto-Watchung-Mount Lucas Association

SHADED AREAS SHOW THE LOCATION OF FLOODPLAIN SOILS

Soil Association Map of East Goshen Township

FIGURE 2
Soil Characteristics - East Goshen Township

SOIL SERIES	PARENT MATERIAL	DEPTH TO SEASONALLY HIGH WATER TABLE (FT.)	DEPTH TO ROCK (FT.)	SUTABILITY FOR ON-SITE DISPOSAL
Aldino (Silt Loam)	Serpentine	½ - 1'	1½ - 2½	Slowly Permeable
Brandywine (Loam)	Baltimore Gneiss	10'+	3' - 4'	Well Suited
Calvert (Silt Loam)	Serpentine	0 - 1'	3'+	Seasonal High Water Table
Chester (Silt Loam)	Wissahickon Schist	5'+	5' - 6'	Well Suited
Chewacla (Silt Loam)	Upland Alluvium	0 - 1'	3' - 6'	Seasonal High Water Table and Flooding
Chrome (Gravelly Silty Clay Loam)	Serpentine & Chlorite Schist	5'+	1' - 2½'	Shallow Soil
Congaree (Silt Loam)	Upland Alluvium	3'+	3' - 6'	Well Suited Dependent on Location
Conowingo (Silt Loam)	Serpentine	1' - 2'	3'- 4'	Shallow Depth & Seasonal High Water Table
Glenelg (Channery Silt Loam)	Wissahickon Schist	5'+	3' -5'	Well Suited
Glenville (Silt Loam)	Baltimore Gneiss Wissahickon Schist	1' - 1½	3' - 6'	Limited by Clay-pan & Seasonal Water Table
Manor (Loam)	Baltimore Gneiss	5'+	2' - 7'	Well Suited
Neshaminy (Gravelly Silt Loam)	Baltimore Gneiss	5'+	4' - 6'	Well Suited
Wehadkee (Silt Loam)	Upland Alluvium	0' - 1'	5' - 8'	High Water Table
Worsham (Silt Loam)	Baltimore Gneiss Wissahickon Schist	0' - 1'	3' - 5'	Slow Permeability & Seasonal Water Table
Montalto (Channery Silt Loam)	Triassic Diabase	5'+	3' - 5'	Slow Permeability

Neshaminy-Glenelg Association. The Neshaminy-Glenelg Association includes soils that are deep to moderately deep, moderately permeable, well-drained, and located on gentle to steep slopes. The Neshaminy soils developed mainly from weathered Gabbro and Granodiorite. The presence of igneous rock produces a bright reddish coloration in the subsurface horizons.

Also included in this association are the Glenville, Worsham, Chewacla, and the Wehadkee soils. The Glenville and Worsham soils are developed mainly from granite,schist, and gneiss. They are deep, moderately well-drained and poorly-drained, respectively. These soils occur in low-lying areas, in depressions, and at the bases of slopes. The Worsham can also be found in seepy areas and along streams. The Chewacla and Wehadkee are also floodplain soils developed in alluvium materials from upland soils. The Chewacla are deep soils, moderately permeable, and moderately well-drained. Mottling typically occurs between 12 and 30 inches from the surface. The Wehadkee are poorly-drained soils, and their surface layer is dark and mottled.

Glenelg-Manor-Chester Association. The principal soils in the association are the Glenelg, Manor, Chester, Brandywine, Worsham, and Glenville. There are also less extensive areas which include the Wehadkee, Chewacla, and Congaree floodplain soils. This association basically consists of soils that are moderately deep to deep, are well-drained, and have developed from weathered igneous bedrock of schist and gneiss.

The Glenelg soils are moderately deep, moderately permeable upland soils. The Glenelg soils are similar to Chester soils, but are more shallow with generally shallow depths to rock. The Chester soils are usually deep, well-drained and shallow soils. They are generally located on hilly or steep areas with 15-20% slopes. The slope and porous structure causes the soils to have moderately rapid permeability and become droughty.

The Worsham and Glenville soils are deep, and poorly-drained and moderately-drained, respectively. These soils generally occur in low-lying areas, in depressions and at the base of slopes. The Worsham soils can be found in seepy areas and along streams.

The Congaree, Chewacla, and Wehadkee are all floodplain soils developed from upland alluvium materials. The Congaree soils have a thick silty surface horizon, and a deep profile that is well-drained and is moderately permeable. Mottling typically occurs between 30 and 60 inches below the surface, and these soils are occasionally flooded. The Chewacla are better drained, more permeable, and deeper than the Wehadkee with mottling 12 to 30 inches below the surface.

Neshaminy-Chrome-Conowingo Association. The Neshaminy-Chrome-Conowingo Association are soils developed mainly over formations of serpentine and from Gabbro and Granodiorite. These soils are predominantly located on moderate slopes, however, the Chroma soils have been found on very steep grades.

The Neshaminy soils are deep, well-drained, moderately permeable and their subsurface horizons are reddish colored from the weathered Gabbro. The Chrome soils range from shallow to moderately deep and are well-drained. They range from a dark, gravelly silty clay loam to a dark yellowish-brown clay. The soils are developed from acid rocks, and depth to bedrock is quite variable. The soils are free of mottling, but the heavy texture and shallow profile tend to restrict drainage. In the steep areas, the soils are severely eroded.

Similar to the Chrome soils, the Conowingo soils are developed in materials weathered from igneous rocks. Their profile ranges from deep to moderately deep, and they are moderately well-drained to somewhat poorly-drained soils. Typically, mottling occurs in the subsoil at about 15 to 25 inches from the surface.

Montaldo-Watshung-Mount Lucas Association. The soils in this association have been typically developed on igneous rocks. These soils are described as being deep, silty and channery soils as found in other part of Chester County. The Montaldo channery silt loams, however, which are found in the southern part of the Township, exhibit a severely eroded profile. This soil has lost nearly all of its original surface layers to the point where the underlying subsoil is now exposed. The silty clay loam subsoil contains more clay than the soils in the Neshaminy-Glenelg Association. (The presence of this soil in Ashbridge-Firethorne area explains the unusually high failure of onlot systems within this area which resulted in the provision of public sewers for the homes in this vicinity in 1986.)

Soils Renovation Ability

The effective operation of a subsurface sewage disposal system is dependent on proper installation, site selection, and more specifically, on good soil characteristics. The criteria used to judge the suitability of a site includes the size of the area, the slope, the soil properties and soil depth, permeability. texture and structure. A verification of these soil properties is necessary to insure the satisfactory renovation of the sewage effluent physically, chemically and biologically, and to prevent the hazards of system malfunction or ground water contamination.

Soil permeability affects the rate of water movement through the soil. The factors that affect permeability are soil texture and structure.

Soil texture factors include the mineralogical composition and physical size distribution of sand, silt or clay-sized particles. A soil with a high percentage of coarse sands is rapidly permeable, so that water drains quickly through the profile. Conversely, if the soil has a high percentage of clay, the water becomes perched in the soil at shallow depths. In an on-site disposal system, such soils may result in surface outbreaks around the system, causing the disposal area to be saturated and marshy.

The physical renovation of sewage optionally occurs in a soil with moderate depth and permeability as well as gently sloped. The ability to chemically renovate sewage is dependent on soils with a proper clay content in as much as the clay particles will attract and react with the chemicals in the effluent to cleanse it. The majority of biological renovation is performed by the organic matter and by the micro-organisms that occur in the top 18 inches of the soil.

Suitable Soils in East Goshen Township

The soils in East Goshen Township that meet all of the criteria to suitably renovate sewage include the following series: Chester, Glenelg, Manor, and Neshaminy. Although there may be some exceptions due to specific site characteristics, for the most part, these soils have an appropriate depth, slope, permeability, texture, and structure, and are capable of supporting the physical, chemical, and biological activities that will insure the satisfactory renovation of sewage effluent.

In general, the majority of the upland soils in the northern portion of the Township are well suited to long-term use of on-site systems for single family units, community systems, and spray irrigation. To define feasibility of any site, a detailed evaluation is necessary since soils, slope, texture, and evidence of seasonal high water table are variable.

The area which is underlain by and/or adjoins the serpentine typically has shallow soil depths, tight rock and shallow water tables which make it unsuitable for on-site disposal options. The southern area of the Township displays a much more varied soils sequence which is often characterized by heavier soils, shallow depth to mottling and water table. It is recommended that all future investigations to define soil suitability for on-site disposal must be more carefully evaluated since the soils exhibit this degree of variability.

1.4 Existing and Projected Population Data

East Goshen Township has grown from a population of 1,039 persons in 1950 to 15,138 persons in 1990 according to the US Census results. The growth since 1970 has averaged a 5,000-person increase during each of the 10-year periods. The Township adopted a new Comprehensive Plan in October 1992, which contains all relevant data regarding historical population growth and projected ultimate population at the time of build-out for all uncommitted land development as of 1992. Table 1.1 depicts the Population Change between 1950 and 1990. Table 1.2, Population Characteristics, depicts all relevant factors in the population characteristics as measured between 1980 and 1990.

Table 1.1

POPULATION CHANGE
1950-1990

YEAR	TOTAL POPULATION	POPULATION CHANGE	
		NUMERICAL INCREASE	AVG. ANNUAL CHANGE
1950	1,039	---	---
1960	1,694	655	66
1970	5,138	3,444	344
1980	10,021	4,883	488
1990	15,138	5,177	538

POPULATION CHARACTERISTICS

EAST GOSHEN TWP.	1990	1980	Percent Change
TOTAL POPULATION	15,138	10,021	51.1
SEX			
Male	7,354	4,918	49.5
Percent of total population	48.6	49.1	
Female	7,784	5,103	52.5
Percent of total population	51.4	50.9	
AGE			
Under 5 years	944	621	52.0
Percent of total population	6.2	6.2	
5 to 17 years	2,528	2,247	12.5
Percent of total population	16.7	22.4	
18 to 20 years	531	440	20.7
Percent of total population	3.5	4.4	
21 to 24 years	837	788	6.2
Percent of total population	5.5	7.9	
25 to 44 years	5,176	3,566	45.1
Percent of total population	34.2	35.6	
45 to 54 years	1,857	1,056	75.9
Percent of total population	12.3	10.5	
55 to 59 years	677	460	47.2
Percent of total population	4.5	4.6	
60 to 61 years	306	120	155.0
Percent of total population	2.0	1.2	
62 to 64 years	464	168	176.2
Percent of total population	3.1	1.7	
65 to 74 years	1,232	364	238.5
Percent of total population	8.1	3.6	
75 to 84 years	505	145	248.3
Percent of total population	3.3	1.4	
85 years and over	81	46	76.1
Percent of total population	0.5	0.5	
Median age	35.7	29.5	
Under 18 years	3,472	2,868	21.1
Percent of total population	22.9	28.6	
18 to 64 years	9,848	6,598	49.3
Percent of total population	65.1	65.8	
65 years and over	1,818	555	227.6
Percent of total population	12.0	5.5	
RACE AND HISPANIC ORIGIN			
White	14,504	9,682	49.8
Percent of total population	95.8	96.6	
Black	399	236	69.1
Percent of total population	2.6	2.4	
American Indian, Eskimo, or Aleut	18	6	200.0
Percent of total population	0.1	0.1	
Asian and Pacific Islander	185	61	203.3
Percent of total population	1.2	0.6	
Other race	32	36	-11.1
Percent of total population	0.2	0.4	
Hispanic origin (of any race)	45	70	-35.7
Percent of total population	0.3	0.7	

	1990	1980	Percent Change
HOUSEHOLDS BY TYPE			
Total households	6,119	3,736	63.8
Family households (families)	4,135	2,600	59.0
Percent of total households	67.6	69.6	
Married-couple households	3,635	2,300	58.0
Percent of total households	59.4	61.6	
Other family, male householder	139	83	67.5
Percent of total households	2.3	2.2	
Other family, female householder	361	217	66.4
Percent of total households	5.9	5.8	
With related children	185	138	34.1
Percent of total households	3.0	3.7	
Persons per family	3.05	3.30	
Nonfamily households	1,984	1,136	74.6
Percent of total households	32.4	30.4	
Householder living alone	1,637	919	78.1
Percent of total households	26.8	24.6	
Persons in households	15,122	10,015	51.0
Persons per household	2.47	2.68	
MARITAL STATUS (Persons 15 years +)			
Persons 15 years +	3,337	7,679	-56.5
Never married	750	1,999	-62.5
Percent of persons 15 years +	22.5	26.0	
Now married, except separated	2,198	4,670	-52.9
Percent of persons 15 years +	65.9	60.8	
Separated	55	193	-71.5
Percent of persons 15 years +	1.6	2.5	
Widowed	170	342	-50.3
Percent of persons 15 years +	5.1	4.5	
Divorced	164	475	-65.5
Percent of persons 15 years +	4.9	6.2	
GROUP QUARTERS			
Persons living in group quarters	16	6	76.5
Percent of total population	0.1	0.1	
Institutionalized persons	16	2	200.0
Percent of group quarters pop.	100.0	33.3	
Other persons in group quarters	0	4	-100.0
Percent of group quarters pop.	0.0	66.7	
Group quarters population under 18	0	0	0.0
Percent of group quarters pop.	0.0	0.0	
Group quarters population 18 to 64	0	5	-100.0
Percent of group quarters pop.	0.0	83.3	
Group quarters population 65 +	16	1	500.0
Percent of group quarters pop.	100.0	16.7	
LAND AREA AND POPULATION DENSITY			
Total population	15,138	10,021	
Square miles	10.1	10.1	
Persons per square mile	1,498.8	992.2	

TABLE 1.2

Based on the 1990 population of 15,138 persons, the 1992 Township Comprehensive Plan projects further population growth which should reach an ultimate projected population of 21,434 persons. This would include projected and estimated growth for uncommitted land, land currently under construction, and committed population in approved subdivisions but not yet under construction. These figures are shown in Table 1.3.

Table 1.3

ESTIMATE OF ULTIMATE POPULATION

CATEGORY	POPULATION	% OF ULTIMATE POPULATION
1980 Population	10,021	
Population increase - 1980 to 1990	5,117	
1990 POPULATION	15,138	71%
Estimated Population in Committed Residential Developments But Not Under Construction	576	3%
Estimated Population of Residential Developments Under Construction	1,101	5%
Estimated Population on Uncommitted Land	4,619	21%
PROJECTED ULTIMATE POPULATION	21,434	100%

The 1992 Comprehensive Plan also notes that if East Goshen Township continues to grow at the same rate as measured between 1979 and 1990, then population build-out could occur within approximately nine years or the year 2001.

1.5 Wetlands Identification

Enclosed in Section 1.3 is Exhibit 2 which is taken directly from the Chester County Soils Map for East Goshen Township and shows separately the hydric soils. The hydric soils are identified on Exhibit 2 as follows:

- CH - Chewacla silt loam
- CAA & CAB - Calvert silt loam
- GNA & GNB - Glenville silt loam

- WE - Wehadkee silt loam
- WOA & WOB - Worsham silt loam

As a part of the routine Township planning process, all wetlands must be delineated and shown on any land development plan and/or subdivision plan submitted to East Goshen Township. Wetlands must be excluded from development unless permits are obtained under the joint permit process administered by PaDER. There are exceptions which may be permitted for utility crossings, minor road crossings, and for wetlands intrusions for which mitigation plans are submitted and approved by permit. Generally, intrusion into wetlands, other than as permitted by law, is not expected to be a major problem within East Goshen Township.

1.6 Public Water Services and Other Potable Water Supplies

Exhibit 3 depicts areas located within East Goshen Township which are provided with public water service by the West Chester Area Municipal Authority and by the Philadelphia Suburban Water Company. Table 1.4 incorporates an estimate of the number of customers or connections served by the WCAMA and the Philadelphia Suburban Water Company. However, the two public water companies or authorities could not provide an accurate estimate of the number of EDUs served or the specific number of residential units for which public water is provided. (The estimated range was 95 to 89 percent residential units as being customers.)

The balance of potable water utilized within East Goshen Township is provided by private wells. The general quality of ground water resources serving private dwellings, commerce and industry is excellent within East Goshen Township. A complete summary of the ground water resources of East Goshen Township is already documented on pages 23 to 26 of the 1981 Act 537 Plan Update prepared by Walter B. Satterthwaite Associates and has not changed substantially since 1981.

It is expected that Philadelphia Suburban Water Company will gradually expand its public water service similar to expansions which have occurred since 1980.

TABLE 1.4

PUBLIC WATER SERVICE - 1992

West Chester Area Municipal Authority	40 customers
Philadelphia Suburban Water Company	2,300 customers

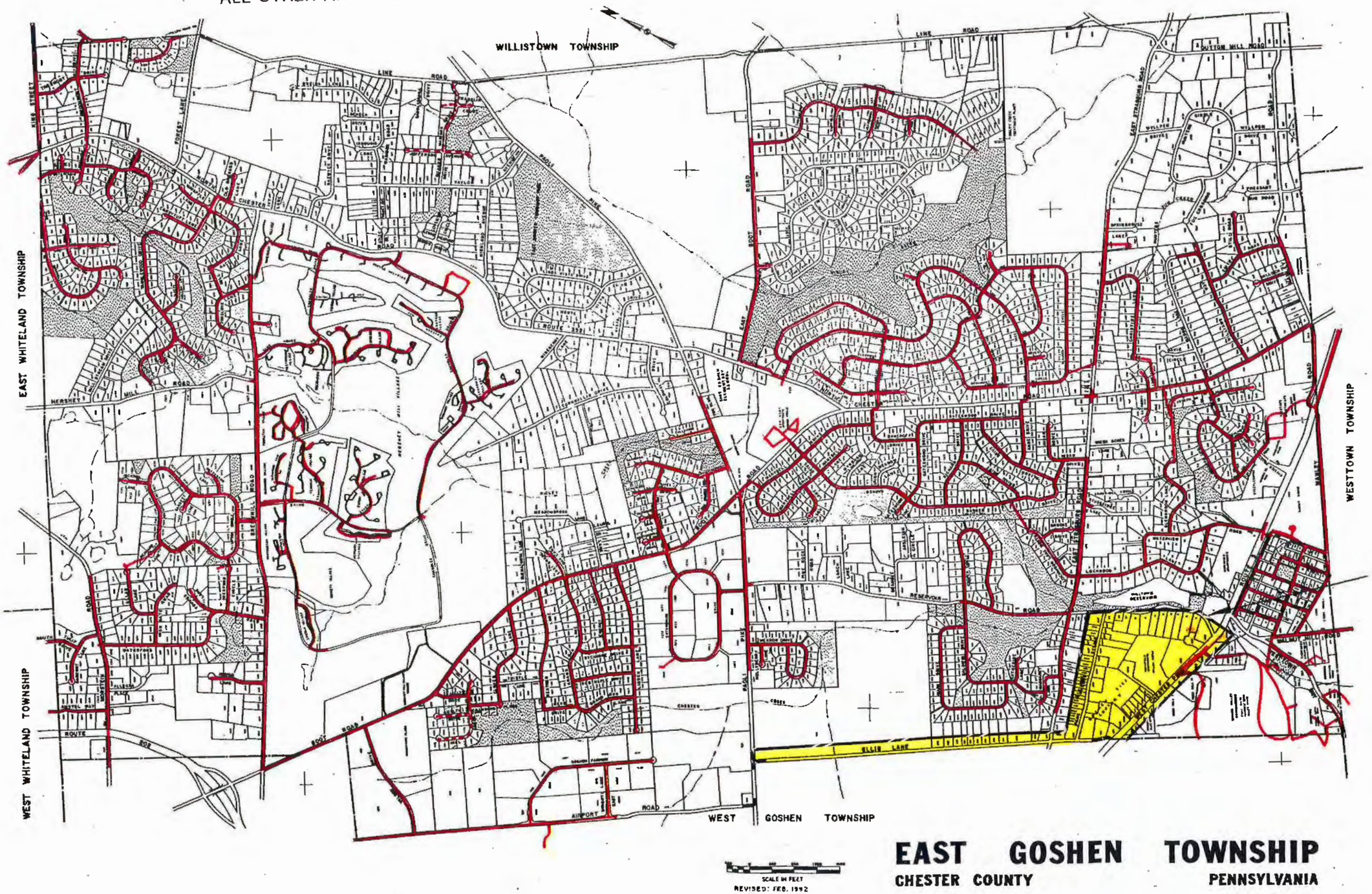
The West Chester Area Municipal Authority expects to extend service along Park Avenue beyond the Goshen Fire Company building in 1993-1994.

The PSWCO does not have an available forecast for the precise number of new connections to be made during each of the five-year planning cycles covered by this Act 537 Plan Update. However, it is expected that all new residential units constructed after 1992 will be provided with public water service.

UPDATED ACT 537 WASTEWATER
FACILITIES PLAN
DECEMBER 1992
EAST GOSHEN TOWNSHIP

P.S.W.C. FRANCHISE COVERS

ALL OTHER AREAS OF TOWNSHIP



EAST GOSHEN TOWNSHIP

CHESTER COUNTY PENNSYLVANIA

AREAS SERVED BY PUBLIC WATER

EXHIBIT 3

2.0 EVALUATION OF EXISTING SEWAGE TREATMENT FACILITIES/SYSTEMS

2.1 Evaluation of Ridley Creek Wastewater Treatment Facility

The need for a sewage treatment facility located along Ridley Creek within East Goshen Township was first discussed in the mid-1960s with serious planning efforts made during the 1970s. During 1978, an update of the Township's Act 537 Plan studied the environmental concerns along Ridley Creek.

The first site chosen for the location of the Ridley Creek STP was located on the Grace Estate property just north of Strasburg Road and along the stream valley. The initial application for capacity for the Ridley Creek STP was 1.2 MGD. Challenges to the location and proposed capacity of this STP eventually led to relocation just north of the Grace Estate property to a site within the Bow Tree Development. The design capacity for the STP was also scaled back from 1.2 MGD to 0.4 MGD although portions of the STP were initially designed to handle up to 0.7 MGD

The treatment plant was designed during 1983-1984 and was built in 1984-1985 with the first units going on-line during 1985.

The Township and the Municipal Authority participated heavily in the design, construction, and inspection of the new Ridley Creek STP which was offered to East Goshen Township as its first public wastewater treatment facility. The STP was dedicated to and accepted by East Goshen Township during 1990. The Township and its Municipal Authority have operated the facility since that date. Many of the initial properties considered for connection to the STP have been designed and constructed. The Bow Tree Farms development has 338 EDUs connected to the STP with guaranteed or committed future EDU connections totalling 166. Another initial participant in the reduced 0.4 MGD STP plant construction was SmithKline Beecham with direct connection rights totalling 40,000 GPD and an option to purchase an additional 12,000 GPD within the remaining capacity of the plant (the option has now expired).

The various developments which were connected by 1992 and those for which commitments were made by the Township for connection to the Ridley Creek STP appear in Table 2.1.

Table 2.1 shows that the Ridley Creek STP (up to October 1992) had a hydraulic flow loading of 333,127 GPD in theoretical sewage flow. However, the average 1992 plant flow of 230,475 GPD (through October 1992) shows that only 69.19 percent of the theoretical flow actually reaches the treatment facility. In

TABLE 2.1

COMMITTED AND ON-LINE SEWAGE FLOWS TO
RIDLEY CREEK SEWAGE PLANT
AS OF OCTOBER 28, 1992

Area to be Served	GPD On-Line	GPD Committed Or In Progress
Bow Tree Farms	115,500	52,200*
Vista Farms - 65 SFD	22,750	0
Hunt Country - 71 SFD	24,850	0
Wentworth - 65 SFD	14,000	8,750*
East Goshen Elementary School	10,000	0
SmithKline Beecham	10,000	30,000*[1]
Goshen Village Commercial	13,000	0
Hancock Building - Phases I & II	3,600	2,400*
Paoli Pike - 352 - Paoli Pike Corner	5,950	350*
Taylor/Highland Area - 64 EDUs	0	22,400
Spinozzi & McClosky - 10 EDUs	0	3,500
Coventry Woods - 16 EDUs	0	5,600
Waterford - 26 EDUs	0	9,100
Meadowbrook/Cornwallis Area	0	26,600
Bellingham Life Care Facility	28,000	0
Bentley Construction	900	0
Philadelphia Suburban Water Company	157	0
New Kent Apartment Complex	84,420	0
Totals	333,127	160,900

Note: Average 1992 (to October) Plant flow = 230,475 GPD which equals 69.19% of theoretical EDU flow

Note: * = Committed and paid for

Note (1) = SKB also has an option to purchase an additional 12,000 GPD (now expired).

Factors used: SFD = 350 GPD/unit and Apt. (apartment) = 200 GPD/unit.

addition to the theoretical gallons per day actually on line, the Township has made commitments as depicted in Table 2.1 for an additional 160,900 GPD (theoretical flow) which would bring the total sewage flow at the STP to 494,027 GPD (351,113 GPD actual flow) when these committed connections are made. The actual flow is substantially below the 0.4 MGD reflected on the PaDER permit for this facility. If the New Kent Apartment Complex is shifted to Chester Creek, the above figures are reduced by 84,420 gpd.

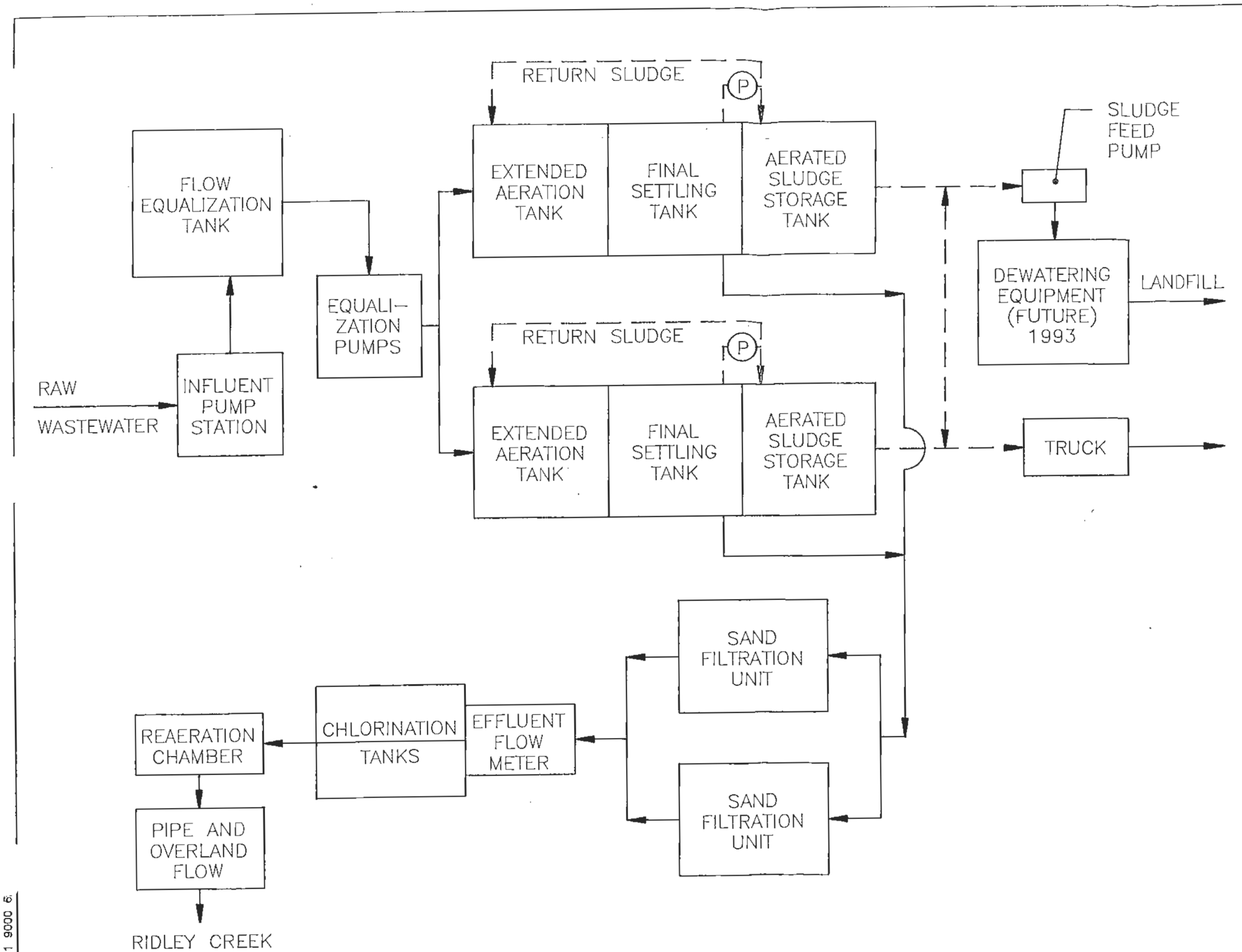
Wastewater Treatment Facility

The treatment plant site is located below the Bow Tree Subdivision, Section IV, and primarily provides capacity for developments located within the Ridley Creek drainage area. The treatment plant is nominally designed to handle 400,000 gallons per day (gpd) and discharges to Ridley Creek. It is currently operated under an NPDES permit which expires in October 1995.

The treatment plant is an extended aeration system followed by filtration, chlorination, and reaeration prior to discharge to the Ridley Creek. A schematic flow diagram of the facility is enclosed as Figure 2-1. The facility consists of an influent pumping station pumping with flow directed to a flow equalization tank (120,000 gallons) which is then pumped to two packaged-steel (DAVCO) aeration systems each having 250,000 gallons of aeration capacity. This is followed by clarification with each unit having a 25,000-gallon aerated storage tank with the effluent from the clarifiers going through two sand filtration units rated at two gallons per square foot per day. This is followed by chlorination, reaeration, and discharge. The treated wastewater discharges via header pipes into a wetland for overland flow prior to discharge to the creek.

The sludge is currently trucked off site. In 1993, dewatering equipment (a belt filter press) is scheduled to be installed which will permit the future option of land application or landfill disposal. The Authority has requested a long-term commitment from the Chester County Solid Waste Authority for dewatered sludge disposal at the Lanchester Landfill.

The treatment plant discharge criteria are enclosed as Figure 2-2, which is a copy of the Part A, NPDES permit for this facility. Effluent standards differ dependent upon the period of the year. From May 1 to October 31, the $CBOD_5$ monthly average is 10 mg/l in conjunction with 30 mg/l suspended solids, and 4 mg/l of ammonia as nitrogen. In the winter months (November 1 through April 30), the $CBOD_5$ is 20 mg/l with suspended solids of 30 mg/l, and ammonia at 12 mg/l.



LEGEND

FORWARD FLOW

SLUDGE FLOW

(P) PUMP (AIR LIFT)

N

EAST GOSHEN TOWNSHIP
SEWAGE FACILITY PLAN

FIGURE NO. 2.1
RIDLEY CREEK SEWAGE
TREATMENT PLANT
SCHEMATIC FLOW
DIAGRAM

SMC ENVIRONMENTAL
SERVICES GROUP
Engineers, Managers, Scientists & Planners
VALLEY FORGE, PA.

SCALE: NONE | DATE: 11/6/92

031 9000 6

I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR DISCHARGE 001;
LOCATED AT LATITUDE 39°59'10", LONGITUDE 75°31'43"

A. During the period beginning at issuance and lasting through expiration, the Permittee is authorized to discharge.
B. The average monthly flow of effluent discharged from the wastewater treatment facility shall not exceed 400,000 gallons per day.
C. The quality of effluent shall be limited at all times as specified in Footnote (3) and as follows:

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS		
	MASS UNITS (lbs/day)		CONCENTRATIONS (mg/l)						
	AVERAGE MONTHLY	AVERAGE WEEKLY	AVERAGE ANNUAL	AVERAGE MONTHLY	AVERAGE WEEKLY	INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.D
FLOW (MGD)							Continuous	Recorded	
CBOD-5 (5-1 to 10-31)	33	50		10	15	20	1/Week	24 HC	
CBOD-5 (11-1 to 4-30)	67	100		20	30	40	1/Week	24 HC	
SUSPENDED SOLIDS	100	150		30	45	60	1/Week	24 HC	
AMMONIA as N (5-1 to 10-31)	13	20		4	6	8	1/Week	24 HC	
AMMONIA as N (11-1 to 4-30)	40	60		12	18	24	1/Week	24 HC	
FECAL COLIFORM (5-1 to 9-30)			See Footnote (2)				1/Week	Grab	
FECAL COLIFORM (10-1 to 4-30)			Same Limits as in Footnote (2) for Period 5-1 to 9-30				1/Week	Grab	
DISSOLVED OXYGEN			Minimum of 5 mg/l at all times				Daily	Grab	
pH	Within limits of 6 to 9 Standard Units at all times						Daily	Grab	

FOOTNOTES: 1. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

(NPDW).4

BK 2232 PG 582

FIGURE 2.2

Presented in Table 2.2 is the average monthly flow to the treatment plant for the years 1988, 1989, 1990, through 1991. This table indicates that the flow to the treatment plant averages 220,000 gpd to 240,000 gpd, which is well below its hydraulic capability. Table 2.3 presents the influent BOD_5 and suspended solids averages for the years 1990 and 1991. Table 2.4 provides the effluent results for the period 1988 to September 1991. These results indicate that the treatment plant is providing a significantly higher degree of treatment with typical BODs being less than 5, suspended solids less than 5, and ammonia less than 1 mg/l.

The plant appears in excellent operating condition and, based upon the 1991 Chapter 94 Report, is not anticipated to reach capacity until the mid to late 1990s. The plant has experienced only two minor violations over the last several years related to electrical malfunctions of the equalization tank and transfer pumps. According to modifications made, this problem of tank overflow has apparently been corrected. This STP was initially overdesigned and most components have the capability of expansion to 0.7 mgd utilizing the A/O process.

2.2 West Goshen (Chester Creek) Treatment Facility

During the period 1991/1992, an average of approximately 974,599 GPD in theoretical sewage flow from East Goshen Township properties was treated at the West Goshen Wastewater Treatment facility under a long-standing municipal agreement with West Goshen Township. However, the above figure is based upon theoretical flows for each type of unit (SFD = 350 GPD - Apt = 200 GPD - TH = 250 GPD), and the actual monitored sewage flow was 754,769 GPD or 77.44 percent of the theoretical flow.

TABLE 2.2

RIDLEY CREEK SEWAGE TREATMENT PLANT
ANNUAL FLOWS FOR YEARS 1988-1991 (GPD)

	1988	1989	1990	1991
JAN.	151,737	172,625	237,835	239,748
FEB.	168,751	173,718	234,993	222,414
MAR.	148,632	179,990	217,284	228,435
APR.	142,167	171,337	233,450	236,020
MAY	159,323	195,813	227,813	216,617
JUNE	121,540	196,610	226,337	223,610
JULY	141,429	198,765	216,229	229,158
AUG.	149,155	200,300	210,419	220,445
SEPT.	155,083	220,833	222,593	227,147
OCT.	150,297	209,132	221,203	227,229
NOV.	170,737	212,197	215,507	223,103
DEC.	167,236	264,519	232,274	232,574
YEARLY AVE.	152,174	199,653	224,661	227,208

TABLE 2.4

RIDLEY CREEK SEWAGE TREATMENT PLANT
EFFLUENT MONTHLY AVERAGES (lb/day)

1988

	BOD_5	SUSPENDED SOLIDS	AMMONIA
JAN.	1.62	6.78	0.20
FEB.	2.47	6.18	0.12
MAR.	1.4	5.68	0.114
APR.	1.3	6.0	0.13
MAY	1.74	4.14	0.083
JUNE	0.994	4.25	0.169
JULY	1.94	4.84	0.097
AUG.	0.86	3.59	0.072
SEPT.	1.43	6.11	0.12
OCT.	1.19	5.92	0.12
NOV.	2.04	6.30	0.13
DEC.	1.72	7.03	0.14
YEARLY AVERAGE	1.56	5.57	0.12

1989

	BOD_5	SUSPENDED SOLIDS	AMMONIA
FEB.	1.65	6.66	0.13
JUNE	1.64	8.29	0.26
AUG.	1.9	8.14	0.16
SEPT.	1.9	9.38	0.19
OCT.	1.8	8.89	0.18
NOV.	1.6	9.50	2.1
DEC.	2.97	16.6	0.17
YEARLY AVERAGE	1.92	9.64	0.46

TABLE 2.4 - Continued

1990

	BOD_5	SUSPENDED SOLIDS	AMMONIA
JAN.	5.09	24.5	0.22
FEB.	5.4	11.3	0.20
MAR.	2.0	8.94	4.6
APR.	4.5	9.53	0.19
MAY	3.7	10.8	0.19
JUNE	4.4	91.7	0.22
JULY	1.9	9.74	0.19
AUG.	1.6	8.55	0.16
SEPT.	2.0	8.41	0.16
OCT.	1.5	7.56	0.15
NOV.	4.3	7.22	0.16
DEC.	2.6	8.80	0.17
YEARLY AVERAGE	3.25	17.25	0.55

1991

	BOD_5	SUSPENDED SOLIDS	AMMONIA
JAN.	4.2	9.51	0.19
FEB.	2.3	8.00	0.16
MAR.	2.4	9.19	
APR.	3.0	8.00	0.16
MAY	2.5	10.00	0.20
JULY	1.9	9.36	0.19
AUG.	1.5	7.32	0.15
SEPT.	2.7	12.1	0.17
YEARLY AVERAGE	2.6	9.2	0.17

The relative importance of the daily volume of actual sewage treated during 1991 is reflected in Table 2.5.

TABLE 2.5

COMPARISON OF 1991 THEORETICAL AND ACTUAL SEWAGE FLOWS BETWEEN RIDLEY CREEK STP AND WEST GOSHEN STP

Treatment Facility	Theoretical Flow in GPD	Actual Monitored Flow in GPD
Ridley Creek STP	333,127	230,475 (69.2%)
West Goshen STP	974,599	754,769 (77.4%)
Totals	1,307,726	985,244

Source: Township 1991 Sewage Flow Records

Therefore, approximately 76.6 percent of the actual daily sewage flow from East Goshen Township (in 1991) was treated at the West Goshen Wastewater Treatment facility (refer to 1993 Chapter 94 Report for updated flow records).

The West Goshen STP was constructed as a secondary treatment plant during the early 1960s. During 1977 and 1978, the STP was upgraded to a tertiary treatment level. East Goshen has been a participant with West Goshen Township in supporting the operation of this facility and since 1977 as a direct financial participant in the expansion construction related to the tertiary level of treatment.

It is important to note that the actual agreement with West Goshen Township calls for West Goshen to treat up to 1.0 MGD in actual sewage effluent and not 1.0 MGD in theoretical sewage flow. There are several intra-municipal connections where physical areas of West Goshen Township flow into East Goshen and thence sewage flows are rerouted to either gravity or pump station connections leading to the West Goshen STP.

There are actually 49 developments or facilities located in East Goshen Township which are serviced by the West Goshen Wastewater Treatment facility. These individual connections and their theoretical rated sewage flows are contained in Section 3 of this report in Table 3.6. In addition, East Goshen Township has made commitments for 15 properties or developments which will eventually contribute an additional 88,295 GPD in future theoretical sewage flows to be treated at the West Goshen facility. It should be noted that the above additional 88,295 gpd could be substantially increased if East Goshen

Township accepts a possible offer made in late 1993 by the Consultant to West Goshen Municipal Authority to treat up to 780,000 gpd at the expanded West Goshen STP.

The West Goshen Wastewater Treatment facility is located near South Concord Road and discharges into Goose Creek. The West Chester Borough Goose Creek treatment plant also discharges to this same tributary to Chester Creek. The West Goshen STP is operated under a PaDER permit for treatment of up to 4.5 MGD. Of this permitted treatment capacity, 1.0 MGD in actual flow is reserved for exclusive East Goshen Township use.

During the course of preparation of this updated Act 537 Study, telephone interviews were conducted with various West Goshen Township officials including the Township Manager, the West Goshen Sewage Treatment Plant operator, and the consulting engineer to West Goshen Township and its Municipal Authority. These interviews provided the source of the following information.

PaDER has notified West Goshen Township that it must commence planning for future expansion of the West Goshen STP. The plant has a current permit for 4.5 MGD. An Act 537 Plan Update for West Goshen Township is in the process of completion and may be completed during December 1992. The latest target date for completion of the West Goshen Act 537 Plan Update is May 1994.

Typical flows for the West Goshen STP ranged between 4.0 to 4.1 MGD during 1988. Substantial infiltration and inflow (I&I) remediation between 1988 and 1992 has substantially reduced the average daily flow at this STP to 3.5 to 3.8 MGD. East Goshen Township has also conducted extensive I&I remediation for sewer lines and manholes which lead to the West Goshen STP. Jointly, the two townships and other municipalities have reduced the average daily flow by nearly 0.5 MGD in four years. Officials from both West Goshen Township and East Goshen Township estimate that the average actual flow per EDU in West Goshen Township is approximately 334 gallons per EDU and for East Goshen Township the average daily flow is 218 gallons per EDU. It was also estimated that more than 75 percent of the constructed dwelling units in West Goshen Township are connected to the public sewer system. West Goshen Township has cooperative sewage treatment agreements with other adjacent townships including a current agreement with West Whiteland Township for treatment of up to 420,000 GPD and a similar agreement with Westtown Township for treatment of up to 230,000 GPD.

In the current Act 537 Update Study for West Goshen Township consideration is being given to expanding the plant under two options. The first option would expand the rated capacity of the plant from 4.5 MGD to 6.0 MGD at an estimated cost of $6,700,000.

Under this option, the entire 1.5 MGD in additional capacity would be reserved for exclusive use within West Goshen Township.

The second option being studied by West Goshen Township would extend the rated capacity of the STP to 7.0 MGD at a total estimated cost of $7,700,000. This option would allow 1.0 MGD in additional capacity for surrounding townships, including East Goshen Township, if additional capacity was required. In August 1993, East Goshen Township received correspondence from the Consultant representing West Goshen Township stating that "approximately up to 780,000 gpd in reserve capacity... could be allocated to West Whiteland and/or East Goshen Township." East Goshen Township responded, by letter, in September 1993 requesting that the entire 780,000 gpd of additional capacity be reserved for East Goshen Township. Some of this capacity would be utilized to serve properties outside of East Goshen Township. In March 1994, East Goshen Township has not received a response to the request for this allocation.

Table 3.6 which appears in the next section of this Plan depicts 49 developments or facilities located within East Goshen Township which are currently served by the West Goshen STP. The 1991/1992 average daily flow for the 49 developments totals 974,599 GPD (theoretical flow) and 754,769 GPD in actual average daily flow.

There are six existing subdivisions/developments where sewage flow is treated at the West Goshen STP where such effluent is being pumped from locations within the Ridley Creek Watershed. As depicted in the next section of this plan in Table 3.6, the developments include: Hershey Mill Estates; Fairway Village; the Ashbridge/Firethorne Area; Hunters Run; and the Windermere Apartments with such units averaging 136,200 GPD in theoretical flow.

In summary, the West Goshen STP will continue to provide sewage treatment services to East Goshen Township to the extent of 1.0 MGD in actual flow which includes the 49 existing developments which are on-line or committed and three additional developments (Ardleigh Estates, the Brandolini development, and the Wilson property) which are not currently on-line but are committed for connections. As noted above, East Goshen Township has requested in writing a reservation of up to 780,000 gpd at the West Goshen STP based on current expansion plans identified by West Goshen Township.

2.3 Existing Individual Onlot Systems

East Goshen Township has expended considerable funds and effort in constantly monitoring the status of existing onlot systems located within the Township boundaries. The Township has computer files for all known addresses for each onlot system.

This is an on-going process in East Goshen Township although the Township has not yet adopted an ordinance mandating minimum pumping cycles for existing onlot systems. However, the Township frequently publishes educational information regarding the proper maintenance of individual onlot systems in the Township newsletters.

Recent History Regarding Malfunctioning Onlot Systems

The last major Township-wide study of malfunctioning onlot sewage disposal systems was conducted by Walter B. Satterthwaite Associates, Inc., and was published in March 1981. At that time infrared aerial photography was used to screen on-site malfunction areas which was followed by field investigations of suspicious areas.

Table 2.6 below depicts the summary of results of the 1981 survey which can be used to show a correlation with the reported number of malfunctioning onlot systems in 1991.

TABLE 2.6

1981 SURVEY OF Onlot SYSTEM MALFUNCTIONS

	Homes Surveyed	Observed Surface Failures	%	Other Possible Failures
Ashbridge-Firethorne	125	36*	29	1
Vista Farms	58	13	22	--
Charter Chase	98	1	1	4
Brookmont-Tremont Drives	41	1	2	1
Indian Hills	95	3	3	1
Cornwallis & Colonial Drives	28	2	7	--
Grand Oak (Bittersweet)	65	8	12	1
Totals/Percentage	510	64	12.5%	8

* Including community system connections

Source: 1981 Act 537 Plan Revision Study, Page 39

Many of the reported surface failures and potential failures identified in Table 2.6 have now been connected to public sewers including the Ashbridge-Firethorne area, the Vista Farms area, and the Grand Oak (Bittersweet) area. However, there are still a number of existing malfunctioning systems noted during 1991 for which no public sewer systems have yet been constructed. For example, in 1981, within the Charter Chase subdivision, there was one observed surface malfunction and four additional potential malfunctions. During the November 1991 Township-wide survey, there were 11 self-reported current or prior malfunctioning systems with one additional graywater discharge for a total of 12 prior or current malfunctions. This represents a very substantial increase during the intervening 10-year period. Please refer to Addendum at the end of this section regarding 1993 updated information for the Charter Chase subdivision.

Another interesting comparison involves the Cornwallis Drive-Colonial Drive area where in 1981 two onlot malfunctions were reported, or a seven percent failure rate. By 1991, the Meadowbrook/Cornwallis area had eight malfunctioning onlot systems reported with four additional onlot graywater discharges noted representing a substantial increase in failed systems during the 10-year period.

In contrast, the 1981 survey of 95 dwellings in the Indian Hills area reflected three observed failures and one additional possible failure. During the 1991 survey, 38 remaining dwellings not served by public or private sewers were surveyed with no reported malfunctions or other onlot discharges.

1991 Onlot Sewage Facilities Survey

As a part of the 1992 update for the Township's Act 537 Plan, a Township-wide survey was prepared for all known remaining dwelling units within the Township which currently have onlot sewage disposal means. The questionnaires were prepared jointly by SMC staff and the Township staff and were mailed in early November 1991 to 699 residential or institutional units. A 20 to 25 percent response was expected. A 69 percent response was received, which represents one of the highest return mail response levels of this type achieved in recent years. The summary results of the findings for the 1991 survey are depicted in Table 2.7.

The overall results depicted in the Township-wide survey of 1991 reflect 55 malfunctioning onlot systems with 14 of the same properties affected also showing additional graywater surface discharge violations. In addition, 19 residential units reported separate graywater discharge violations only. This represents a total of 74 dwellings with known malfunctions and/or separate washing machine/dishwater discharges to the ground surface, or 15 percent of the total responses received.

TABLE 2.7

1991 SURVEY OF ON-LOT SYSTEM MALFUNCTIONS AND GRAYWATER DISCHARGES

Development/Area	Surveys Mailed	Number of Responses	% Response	Malfunctioning Systems	% Violations	Other Discharges on Same Property Malfunction	%	Graywater Discharge Violation Only
Charter Chase Number of Surveys	98	76	77.55%	11	14.47%	1	1.32%	1
Mill Valley Number of Surveys	25	16	64.00%	1	6.25%	0	0.00%	1
Meadowbrook/Cornwallis Number of Surveys	73	48	65.75%	8	16.67%	3	6.25%	4
Goshen Downs Number of Surveys	73	52	71.23%	3	5.77%	1	1.92%	1
Wyllpen Number of Surveys	42	22	52.38%	3	13.64%	1	4.55%	0
Indian Hills Number of Surveys	38	6	15.79%	0	0.00%	0	0.00%	0
Taylor/Highland Number of Surveys	62	49	79.03%	9	18.37%	4	8.16%	5
Miscellaneous Number of Surveys	288	213	73.96%	20	9.39%	4	1.88%	7
Totals	699	482	68.95%	55	11.41%	14	2.90%	14

Source: Township Survey November, 1991.

9829:FTTB32J.WP

The highest number of reported onlot malfunctions occurred in the Charter Chase subdivision where 11 owners reported current and prior system failures with one additional graywater discharge. Please refer to the 1993 Addendum at the end of this section regarding the Charter Chase subdivision.

The area reflecting the second highest number of malfunctions is the Taylor Avenue/Highland Avenue area with nine malfunctions (four of which had additional surface water discharges) and five individual residential properties showing separate surface graywater discharges. When combined, this represents 28 percent of the responding homeowners reporting either a malfunction or a graywater discharge.

As expected, the Meadowbrook/Cornwallis area reflected eight malfunctioning systems (with three graywater discharges on the same properties) plus four additional separate graywater discharges or a 25 percent rate of violation using the combined reported rates.

The Wyllpen subdivision reported three malfunctions and reflected an approximate 14 percent rate of failed systems.

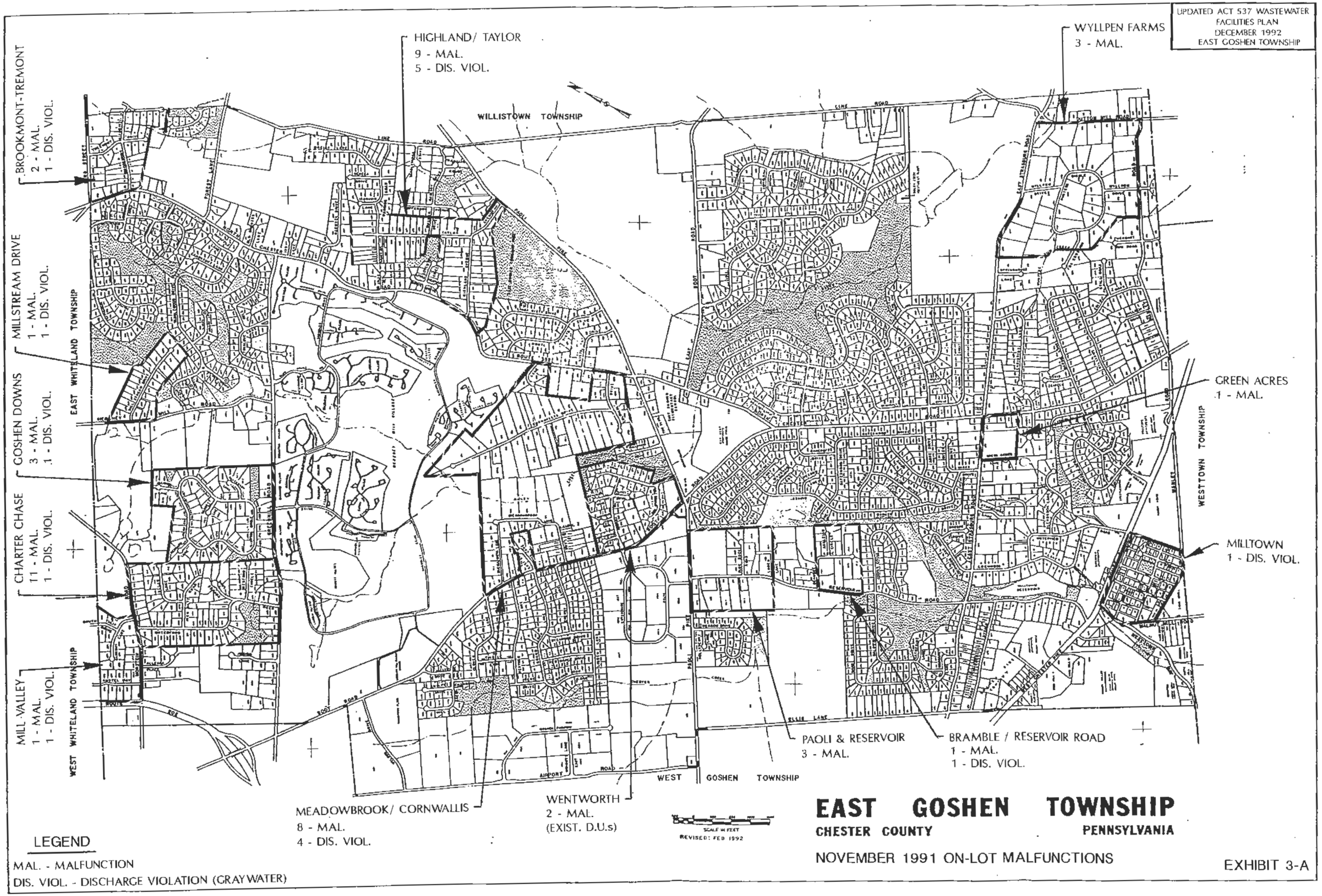
The miscellaneous area surveys reported in Table 2.7 involved 288 residential units and generated 213 returned survey forms indicating a response rate of 74 percent. There were 20 random malfunctioning systems (four of which also reported graywater discharges) and an additional seven reports of separate graywater discharge violations only. The malfunctioning systems and separate graywater violations constitute approximately 13 percent of the responding residential units.

The miscellaneous surveys were distributed to all known units having on-lot disposal systems on the following streets or roads: Atlee Drive; Boot Road; East Boot Road; Bramble Lane; Brookmont Drive; East Strasburg Road; Ellis Lane; Forest Lane; Gates Drive; Greenhill Road; Green Acres Lane; Hershey Mill Road; Ivy Lane; King Road; Larch Lane; Line Road; Manley Road; Mill Stream Drive; Morstein Road; North Chester Road; North Dutton Mill Road; Old Orchard Lane; West Chester Pike; Paoli Pike; Pine Rock Road; Raewyck Drive; Reservoir Road; and Tremont Drive.

The 20 reported malfunctions for the miscellaneous surveys are quite scattered and do not constitute any particular concentration or pattern of serious malfunctions except in the vicinity of North Chester Road south of Atlee Drive.

Exhibit 3-A reflects the generalized locations of the malfunctioning on-lot systems and the additional graywater discharge violations reported in the 1991 survey. These locations correspond with the data reflected in Table 2.7.

UPDATED ACT 537 WASTEWATER
FACILITIES PLAN
DECEMBER 1992
EAST GOSHEN TOWNSHIP



EAST GOSHEN TOWNSHIP

CHESTER COUNTY **PENNSYLVANIA**

NOVEMBER 1991 ON-LOT MALFUNCTIONS

EXHIBIT 3-A

LEGEND

MAL. - MALFUNCTION

DIS. VIOL. - DISCHARGE VIOLATION (GRAYWATER)

Field Surveys Conducted in March 1991

During late March 1991, members of the Township administration, a member of the Meadowbrook/Cornwallis Homeowners Association, and a representative of the Chester County Health Department conducted field surveys within the Meadowbrook/ Cornwallis community to determine the extent of visible malfunctions and the graywater discharges visible on the ground. This survey involved a total of 36 properties along Meadowbrook Lane and Boot Road and 41 additional properties in the Cornwallis Drive/Colonial Drive area. A total of 77 properties were viewed in the field.

The categories for field classification of violations/non-violations are listed below:

1) Not Surfacing - No evidence of septic tank overflow or existing evidence of surfacing.

2) Washwater Discharge - Visible current evidence that graywater was being discharged on the ground.

3) Must Pump - Homeowner verified that frequent pumping was required to prevent sewage from backing up into the dwelling or overflowing onto the ground.

4) Surfacing in the Past - Visible field evidence that the wastewater system had overflowed recently. Also includes property where waste remnants were found at the cleanout or on the ground around the septic tank cleanout.

5. Surfacing Now - Visible evidence of sewage effluent running onto and across the ground surface.

Table 2.8 indicates the results of the Meadowbrook/ Cornwallis field survey.

TABLE 2.8

1991 FIELD SURVEY - MEADOWBROOK/CORNWALLIS

	Meadowbrook Lane/Boot Road	Cornwallis Area	Combined
Not Surfacing	24	25	44
Washwater Discharge	2	5	7
Must Pump	1	0	1
Surfacing past	4	7	11
Surfacing	5	4	9
TOTAL	36	41	77

This field study indicated a total of nine dwelling units depicting current wastewater surfacing and seven additional washwater or graywater discharges. A comparison with the results of the mail survey depicted in Table 2.7 for the Meadowbrook/ Cornwallis area reflects eight malfunctioning systems (compared with nine in the field survey) and four separate graywater violations (compared with seven similar violations noted in the March 1991 field survey).

By carefully comparing the results of the field survey on a lot-by-lot basis with the responses received in the November 1991 mail survey, it is noted that five of the properties reflecting malfunctions or discharge violations did not respond to the survey. This adds considerable weight to the field survey results depicted in Table 2.8.

In summary, there are probably four or five additional residential properties in the Meadowbrook/Cornwallis area which have current malfunctioning sewage systems or graywater discharge violations which were not reflected by the current owners. This is attributable to no response to the mail survey and/or ignorance of what constitutes a graywater discharge violation.

The property-by-property comparison of the Meadowbrook/ Cornwallis area further confirms that: the field survey showed nine current malfunctions whereas the mail survey respondents reported only eight such violations; the field survey detected seven graywater discharge violations whereas the mail survey disclosed only four such violations; of 16 properties with

definite field surveyed violations, five of such property owners did not respond to the survey; and only one homeowner reported a definite current malfunction which was not detected in the March 1991 field survey. This adds substantial credence to the accuracy of the field survey and also gives a general level of comfort that the mail survey results are reasonably accurate for sewage facility planning purposes.

It is the opinion of SMC, the consultant, that if field surveys were conducted for all 699 dwelling units having on-lot disposal systems, the results would indicate wastewater system malfunctions approximately ten percent higher than reflected in Table 2.7 and that the graywater discharges for the same number of dwelling units would be approximately 15 percent higher than reported in the mail survey.

Reported Type of System Installed for Survey Respondents

Table 2.9 depicts the type of onlot system installed based upon the 483 respondents to the mail survey of November 1991. The primary importance for the information depicted in Table 2.9 is that at least ten percent (and possibly more) of the 483 residents responding, do not know what type of onlot disposal system serves their property. Further, of the 483 persons responding to the survey, 33 residential occupants reported that they had "never pumped their system." This means seven percent of the reporting owners are not aware that they have to pump or alternatively they have lived in the residential unit for a short period of time. These specific dwelling units can be monitored by the Township staff for future potential onlot malfunctions. Hopefully, the public educational program and proposed onlot management system will alert the residential owners as to the frequency of need for pumping their conventional septic tanks and/or cesspools to avoid failures.

TABLE 2.9

SUMMARY - TYPE OF SYSTEM INSTALLED

	# of DUs	%
Conventional/Septic Tank	253	53%
Cesspools	171	35%+
Unknown	48	10%
Sand Mound	7	1%
Aerobic Tank	3	1%
Conventional Trenches	1	---
TOTAL	483	

Follow-up Field Study - Charter Chase Area

As a result of the November 1991 township-wide survey results, the Charter Chase Subdivision was subjected to a walkthrough field survey which was conducted on April 13 and April 20, 1992. Included in the field survey team were one member of the Township Public Works staff, two members of the Chester County Health Department staff, and two representatives from SMC Environmental Services Group, the consultants for the Act 537 Plan Update. Three Sewage Enforcement Officers (SEOs) were present during the two days of field investigation.

The results of the November 1991 mail survey depicted eleven malfunctioning systems and one separate graywater discharge for a total of 12 dwelling units with prior or current violations out of 76 mail responses.

The actual April 1992 field investigation depicted ten additional prior or current malfunctioning units not previously reported in the mail survey and three additional suspected graywater discharges not previously noted in the mail response survey. Therefore, based upon a combination of the self-reported malfunctioning and separate graywater discharges, and the field investigation conducted in April 1992, it is evident that there are 21 existing or past malfunctioning systems and four additional graywater violations within the 98 individual single family detached dwellings located in this area of the Township. Please refer to Addendum at the end of this section regarding a 1993 update for the Charter Chase subdivision.

As a result of the April 1992 field survey, seven letters were forwarded by the Township on April 28, 1992 to various homeowners where additional violations were noted. These notification letters included three residential units where cesspool and/or septic tank covers were considered to be unsafe; two additional graywater discharges; and two homeowners where raw sewage was noted as flowing across the ground surface. The owners of two of the residential units where the additional graywater discharges were noted promptly notified the Township that these were "sump pump discharges" and did not contain any wastewater.

Also as a result of the survey, the Chester County Health Department inspection team members were to follow-up immediately with two homeowners where suspected replacement systems had been installed without a valid County Health Department permit. Of major concern regarding the 97 residential units surveyed (one dwelling was missed in the survey) was the fact that approximately 35 percent of the existing homes within the area showed definite evidence of past overflows or cesspools/septic tanks which were full to near ground level on the dates of the survey. This is indicative of homeowner negligence regarding proper pumping of tanks for existing onlot systems and does not necessarily imply that the systems were malfunctioning.

As a result of the above surveys and other surveys conducted by the Township during the past three years, a Township-wide onlot sewage management program is being recommended as a part of this Act 537 Plan Update. Such a management system will hopefully be adopted by ordinance during late 1994 and will apply to all existing onlot systems regardless of type. In view of the 25 percent prior and current malfunction/graywater problems noted, the Charter Chase area will be analyzed further for possible public sewer needs during the 1998-2002 time period.

2.4 Existing Community-Type and Spray Irrigation Systems

There are several community-type onlot discharge systems and/or spray irrigation systems located in East Goshen Township. Listed below is a discussion of each.

Lockwood Chase Treatment Facility

In February 1981, PaDER issued Permit #1580430 for the construction and operation of a sewage treatment facility and spray irrigation system serving the Malvern Golf Club subdivision now known as the Lockwood Chase subdivision. The permit was issued for the construction of a sewage treatment facility and spray irrigation system for 103 total EDUs, 23 of which are located in East Whiteland Township. This subdivision is located along the northerly border of East Goshen Township to the west of North Chester Road and to the west and north of Fairway Village.

The treatment and spray irrigation system was designed by Tatman & Lee Associates for Ferguson & Flynn Enterprises, the developers of Lockwood Chase.

The treatment system consists of an influent 8-inch ductile iron pipe (D.I.P.) to a bar screen and comminutor; this then feeds to an aerated lagoon with 8-inch D.I.P. influent and effluent lines. The effluent then feeds to a polishing pond thence to a chlorine contact tank, and thence to a discharge pump located within the control building. The final effluent is then pumped to the numerous spray irrigation fields some of which are open areas and some of which are in the wooded areas to the west of the treatment facility.

The permit, as originally issued, requires the following condition which now applies to the East Goshen Municipal Authority which acquired title to this system on January 25, 1988. The restriction, among others, is as follows:

> "The proposed application rates for the spray irrigation areas have been approved based on the assumption of an annual average of 11 mg/l of total nitrogen in the polishing pond effluent which results in the nitrogen loading applied to the wooded area being within the required 200 lbs. N/acre/year. The reason for this restricted nitrogen loading is to insure that the nitrate/nitrogen (NO_3N) level in the ground water does not exceed 10 mg/l. If actual data indicates that the total nitrogen concentration in the effluent is greater than assumed and the (NO_3N) concentration in the ground water is approaching or exceeding 10 mg/l, provisions must be made to reduce the application rates and expand the spray irrigation area to lower the nitrogen loading in the wooded area."

In order to support the above condition, PaDER restricted the use and sale of Lots #52, #53, #54, and #55 for two years or until the above operating conditions were achieved. These lots have now been sold and built upon and thus the spray irrigation areas are limited to those in the original design concept.

Since the East Goshen Municipal Authority acquired ownership and operational responsibility for the Lockwood Chase treatment system, monthly laboratory samples have been provided by the operator for both influent and effluent flows. Although numerous operational problems occurred during the period 1990 to early 1992, it appears that these problems have been resolved and the facility is now being operated within permitted standards.

Table 2.10 depicts the pumped effluent flows for the Lockwood Chase treatment facility for 1991 and for most of 1992. Table 2.10 shows that the peak month for pumped effluent during

TABLE 2.10

TREATED EFFLUENT FLOWS (GPD)
LOCKWOOD CHASE TREATMENT FACILITY
1991-1992

1991 MONTH	EFFLUENT PUMPED	MONTH	EFFLUENT PUMPED
JAN.	21,597	JULY	26,545
FEB.	28,518	AUG.	15,516
MAR.	29,419	SEPT.	20,785
APRIL	20,563	OCT.	20,652
MAY	14,648	NOV.	28,880
JUNE	20,750	DEC.	16,784
		PEAK MONTH -	29,419

1992 MONTH	EFFLUENT PUMPED	MONTH	EFFLUENT PUMPED
JAN.	23,712	JULY	23,648
FEB.	25,603	AUG.	24,529
MARCH	24,694	SEPT.	22,380
APRIL	18,703	OCT.	24,258
MAY	25,006		
JUNE	21,087		
		PEAK MONTH -	25,603

Source: Township/Authority Records

1991 was 29,419 GPD average and for 1992, a peak month discharge of 25,603 GPD average daily flow is shown. Numerous pump failures and electrical failures occurred between January 1991 and February 1992 which were all corrected in a timely fashion.

On June 30, 1991, the comminutor pit was discovered as being in an overflow condition because a large broken piece of PVC lateral vent cap had worked its way through the collection system

to the comminutor. TMH Environmental Services, Inc., the operator of the facility for the Municipal Authority, reported the spillage to PaDER.

One of the vital components of this facility is the final effluent spray pump. Based on one failure, the Authority now maintains a spare pump to assure that effluent can be discharged without excessive pond overloading.

It is the opinion of SMC, the consultants for this Act 537 Plan Update, that the Lockwood Chase treatment facility should not receive any additional effluent from surrounding or nearby areas. The treatment facility operation is now stabilized and is working well and within permit limits. If one or two emergency malfunctions of nearby onlot systems were to occur, it would be appropriate to consider the use of the Lockwood Chase system. However, to assure against overloading of this facility, it is recommended that this plant remain at its current service use of 103 EDUs without additional effluent being introduced.

It should be noted that the average daily flow for a given month from each EDU includes approximately 243 GPD which is higher than the daily flow for equivalent EDUs connected to the West Goshen STP and the Ridley Creek STP. For example, in May 1992, the average daily effluent treated was 25,006 GPD which equates to 243 GPD per connected EDU.

Now that the treatment facility is under a routine maintenance program, the operation should continue smoothly for many years. No extended useful life for this facility has been published, but it is the consultant's best estimate that this facility should provide at least 20 to 25 years of adequate treatment for the Lockwood Chase area.

Willow Pond Community Onlot Treatment System

The Willow Pond treatment facility is a privately-owned treatment plant located to the north of Forest Lane and to the west of Line Road. The treatment facility serves 28 dwellings or EDUs, 15 of which are located in East Goshen Township and 13 being located in Willistown Township. The treatment facility is maintained solely by the Willow Pond Homeowners Association.

This treatment facility was designed by Momenee-King Associates in September 1984. The design flow for this treatment facility is based upon 28 EDUs at 3.2 persons per unit at 75 gal/day/person, or 6,720 GPD. This equates to 240 GPD per dwelling unit. The peak design flow, according to the engineer's report is 56 GPM compared with the engineer's estimated 4.67 GPM in average flow. The system uses two aerobic tanks for treatment which provides assumed tertiary level treatment before pumping to an inground absorption bed area located north of Forest Lane.

During 1991, the original absorption beds failed because excess solids had entered the inground absorption area. A new sewage bed area was installed in mid-1992. The useful life of this new absorption bed is unknown. It is assumed by the owners that the original bed may be returned to service within one to two years after self-renovation.

Several engineering evaluations of the Willow Pond system suggest that the sewage effluent absorption beds are more than adequate, but the treatment tanks tend to introduce excess solids into the effluent. It is doubtful that the homeowners association could or would afford the cost of a replacement treatment plant facility (estimated at $200,000 in 1991 by Yerkes Associates). Therefore, it is assumed that this system may suffer additional malfunctions during the 10-year planning cycle 1993-2002. Although it may be possible to again install replacement or alternate inground sewage absorption areas, this will be a very costly process for the homeowners association.

It is also assumed that the homeowners association will eventually approach the East Goshen Municipal Authority with a request for a Township takeover of this existing community onlot system. A reference to Table 3.7 in the following section of this report indicates that the Willow Pond subdivision is being considered for possible connection to the Ridley Creek STP during the period 1998-2002. However, this can only occur if gravity sewers are extended 4,600 L.F. to the Saddlebrook Farm subdivision at a cost in excess of $400,000.

2.5 Hersheys Mill Spray Irrigation System

The Hersheys Mill development represents one of the largest land areas in East Goshen Township now being developed under a unified plan or planned residential development. The land area comprising Hersheys Mill Village generally extends from Boot Road to North Chester Road and is bounded on the north by Green Hill Road and on the south by the Meadowbrook/Cornwallis area.

The ultimate permitted density for Hersheys Mill Village is 2,032 EDUs. As of August 1992, there were 1,155 occupied dwelling units, which implies there will be an additional 877 units to ultimate build out. However, due to changes in market conditions, the style and type of unit now being marketed and other factors, it is expected that the ultimate EDUs will be slightly less than 2,032 occupied units.

During February 1992, there were 1,133 occupied EDUs with an estimated 1.6 persons per unit contributing approximately 115 GPD per EDU or 130,295 GPD in sewage flow. In addition, it was estimated that the various community facilities at Hersheys Mill contributed an additional 5,000 GPD for an approximate total of

135,000 GPD in average daily influent. The supervisor and plant operator for Hersheys Mill Village estimated that infiltration and inflow (I&I) constituted less than three percent per day of the daily effluent treated. The existing PaDER permit for the entire sewage treatment and spray irrigation system is limited to 325,000 GPD which included 50,800 GPD for Hersheys Mill Estates which has been taken off-line via the Hersheys Mill Village pump station, and this effluent is now treated at the West Goshen STP.

The lagoon system for the Hersheys Mill Village treatment system was designed in the mid-1970s and reportedly the first units were placed on-line during 1976 and 1977. During 1991, a new commercial center was approved for the Hersheys Mill Village complex which will also be connected to the Hersheys Mill treatment facility. However, a November 1993, letter from Wooldridge Construction of Pennsylvania, Inc. expressed interest in reserving 15,000 gpd should additional capacity at West Goshen (or some other source) become available.

Until January 1, 1994, the treatment facility will continue to be owned and operated by Wooldridge Construction, the current developer. In 1994, the Hersheys Mill Homeowners Association will take over the entire system. The current monthly fees charged include $16.50 per EDU which produces an estimated 1992 annual operating budget of $230,000. Of this amount, $47,000 or 20 percent is reserved for capital improvements which is used for lagoon sludge removal, new lagoon liners and normal replacement for pumps and operating equipment. It is the opinion of the consultant and the Township Sewage Administrator that this system is in excellent condition both physically and financially, and there is little need for Township intervention in a system which operates with few, if any, problems.

It is noteworthy that there has not been a PaDER violation in almost 13 years of continuous operation. During 1991, BFI removed 280,000 gallons of sludge/slurry from one lagoon which was trucked to Wilmington, Delaware for disposal. This was the first time that sludge removal had been required since the sewage system was placed in operation. The other lagoons are scheduled for similar sludge removal by 1995-1996. One lagoon is scheduled for installation of a new liner during 1993. Although no liner failures have been noted, this is considered to be a routine replacement.

The three lagoons within the treatment system have a total storage capacity of 40,000,000 gallons. The facility operators have experienced no problems in applying the effluent by spray irrigation for 365 days per year. The spray irrigation area includes 100 acres of which 70 acres of the existing golf course is used for spray fields and 30 acres of permanent open space outside of the golf course is used for winter spraying only. An additional 6.5 acres is reserved for expanded spray areas if

outside of the golf course is used for winter spraying only. An additional 6.5 acres is reserved for expanded spray areas if required at any time in the future. All facilities within the plant operation are served by emergency generators and all pumps and aerating equipment are dual facilities or have backup systems on-line. The plant operators currently apply the treated effluent at a rate of approximately two inches per week which is carefully monitored.

In summary, this treatment plant is operating at 41 percent of its permitted treatment capacity. The current population and/or EDUs during August 1992 constitutes 57 percent of the build out capacity at Hersheys Mill Village. Therefore, it is estimated that there will be some reserve capacity in the treatment system when build out occurs (70,000 to 85,000 GPD), which is estimated to be in eight to ten years.

This is a facility which the East Goshen Municipal Authority could take over at any time should there be a need for such. There is no evidence or desire on the part of the ownership and management of Hersheys Mill Village and the directors of the Hersheys Mill Homeowners Association to have public participation in its sewage treatment system or operations at this time.

Within the 10-year planning cycle, 1993-2002, there is no apparent need for intervention on the part of East Goshen Township or its Municipal Authority. At the estimated time of build out, which could be as early as the year 2000, there should be a remaining unused treatment capacity of 70,000 to 85,000 gallons per day. If at that time there is a need for public ownership, the Township and the Authority could certainly take a look at a possible takeover of the system. If the Hersheys Mill treatment system was publicly owned in the future, the additional unused treatment capacity could be used to serve the adjacent Charter Chase community and other nearby subdivisions if such needs were apparent at that time.

1994 ADDENDUM
AMENDING SECTION 2.3 EXISTING INDIVIDUAL ONLOT SYSTEMS
CHARTER CHASE SUBDIVISION REVISED SUMMARY

Section 2.3 of the preceding text describes the existing status of individual onlot systems in various areas of the Township. The only existing subdivision within East Goshen Township which was scheduled for additional field walk-through surveys was the Charter Chase Subdivision. As a result of the Chester County Health Department review of the December 1992 final draft of this Act 537 Plan Update, strong recommendations were made by the Health Department that an additional walk-through be conducted to confirm the status of onlot malfunctions and graywater discharges.

In compliance with the County Health Department request, additional field walk-through surveys were scheduled and conducted on July 23 and July 27, 1993. A representative of the County Health Department participated in this study which included the Township Manager and a representative of the consultant. The same physical observation process was utilized as in the April 1992 field walk-through surveys. The following information represents a comparison of the 1992 and the 1993 field surveys for the Charter Chase Subdivision:

RESULTS OF APRIL 1992 WALK-THROUGH

a.	Lots malfunctioning - 1992 or reported malfunctioning prior to 1992	21
b.	Lots showing evidence of graywater - 1992	4
c.	Lots reported with no current or prior malfunction or current or prior graywater discharge	73
	Total	98

The following information summarizes the July 1993 walk-through results:

RESULTS OF JULY 1993 WALK-THROUGH

a.	Lots malfunctioning now (1993)	7
b.	Lots with 1993 graywater discharge	3
c.	Lots showing evidence of prior overflow, prior malfunction, or prior graywater discharge, but now renovated	25
	Total	35
d.	Lots which never experienced any problem	63
	Total Lots	98

There are several final conclusions drawn from a careful analysis of the Township-wide 1991 mail survey, the April 1992 field walk-through survey, and the identical 1993 field walk-through survey.

The first conclusion is that many of the people who responded to the Township-wide 1991 mail survey apparently misinterpreted the wording in the survey which related to "discharge on the ground" when the homeowners apparently interpreted the question as being "discharged into the ground." This became evident when comparing the actual returned field surveys for specific dwellings or specific street addresses in Charter Chase where a reported "prior malfunction" had occurred when in fact almost brand-new systems were evident in the field for newly-occupied units and no field malfunctions were evident in either walk-through. Therefore, greater credibility is attached to the 1993 and the prior 1992 walk-through surveys.

The summary of the 1993 field survey depicted seven widely scattered malfunctioning systems and three additional graywater discharge violations representing a total of ten dwelling units with sewage discharge problems as based on a total of 98 residential units surveyed. <u>This represents an approximate ten percent malfunction rate and is considered the most credible evidence to date for this area of the Township</u>.

In addition to the ten percent of widely scattered malfunctioning units, most of the evidence related to the 25 dwelling units reported above for the 1993 survey as "showing evidence of overflow, prior malfunction or prior graywater discharge, but not renovated" should not be considered as current malfunctions. Further, the field surveys indicated conditions where the homeowner simply failed to pump the cesspool or septic

system in a timely fashion. Even though prior evidence of an overflow existed, there was no physical evidence whatever which would show that these units are in violation of current standards.

It is very evident that the Township's administrative staff effort to inform all homeowners in the Charter Chase area of the need for frequent pumping of onlot systems has substantially diminished the reported problems in the Charter Chase Subdivision. There was also ample evidence that many homeowners have responded by having replacement systems installed which have cured or corrected previously reported malfunctions.

In summary, it is the opinion of the Township that there are currently ten widely scattered malfunctioning onlot conditions in the Charter Chase Subdivision. This does not warrant further consideration for providing public sewers at this time. The Charter Chase Subdivision will be kept under scrutiny with suggested follow-through field surveys in 1995 and 1997. It is not expected that there will be any major changes for deterioration of onlot sewage disposal conditions in this area so long as the homeowners continue appropriate and timely pumping and maintenance of their onlot systems.

3.0 EXISTING DEVELOPMENT, PROPOSED LAND USE, FUTURE GROWTH, ZONING, AND FIVE AND TEN-YEAR SEWAGE EXPANSION PLANS

3.1 Existing Developed Areas

Exhibit 1 contained in Section 1.1 of this report depicts the extent of existing development in 1992 including some lots which are committed for development but not yet fully built. The majority of the developed land area within East Goshen Township involves single family detached housing. However, there is a good mix of multi-family development along the West Chester Pike corridor and the new Kent Apartment Complex at Boot Road and North Chester Road.

In terms of extent of development, approximately 67 percent of the 6,400 acres comprising the Township land area is now developed for residential, industrial, commercial, and public purposes. This is reflected in Table 3.1 which appears as Table A-1 in the newly adopted 1992 Comprehensive Plan for the Township. With 4,318 acres developed as of 1990 and an additional 761 acres committed to various developments, this represents 79 percent of the total land area of East Goshen Township. Table 3.1 also depicts approximately 1,321 acres of undeveloped land, or 21 percent of the land area which is subject to future development. An estimate contained within the Comprehensive Plan suggests that approximately one-third of the undeveloped land will not be capable of supporting development due to environmental constraints. A maximum of approximately 65 percent of this land can be expected in the future land development mix, or approximately 860 acres.

TABLE 3.1

LAND DEVELOPMENT CHARACTERISTICS
EAST GOSHEN TOWNSHIP, 1990

CATEGORY	ACRES	PERCENT
Developed Land	4,318	67
Committed for Development	761	12
Undeveloped Land	1,321	21
Township Total:	6,400	100

Source: 1992 Comprehensive Plan

Another important forecast is the probable distribution of future land uses based upon current or 1990 zoning for the Township. This information was also obtained from the 1992 Comprehensive Plan Update. In Table 3.2, the remaining undeveloped land has been incorporated in a development scenario as if the Township was fully and completely developed. This analysis was based upon the 1990 zoning which has not been changed substantially and is not likely to change in the near future.

TABLE 3.2

DISTRIBUTION OF LAND USES
AS CURRENTLY ZONED
EAST GOSHEN TOWNSHIP, NOVEMBER 1990

LAND USE	ACRES	% OF AREA
Single-Family Residential*	4,351	68
Multi-Family Residential	999	16
Commercial	58	1
Industrial	600	9
Business Park	113	2
Public Open Space	206	3
Churches/Schools	73	1
	6,400	100

* Includes privately owned open space.

Source: 1992 Comprehensive Plan

Table 3.2 gives an excellent breakdown of the percentages of Township area which will be devoted to each major use group including 68 percent for single family residential and 16 percent of the land area for multi-family residential. The remaining 16 percent of the Township land area will, at some future date, be developed in accordance with Table 3.2 for various commercial, industrial, public and semi-private uses.

The 1992 Comprehensive Plan also contains an Existing Land Use Map which is reproduced here as Exhibit 4. The Existing Land Use Map describes November 1990 existing land use conditions. The existing multi-family residential units in the West Chester Pike corridor are clearly shown as are the other multi-family

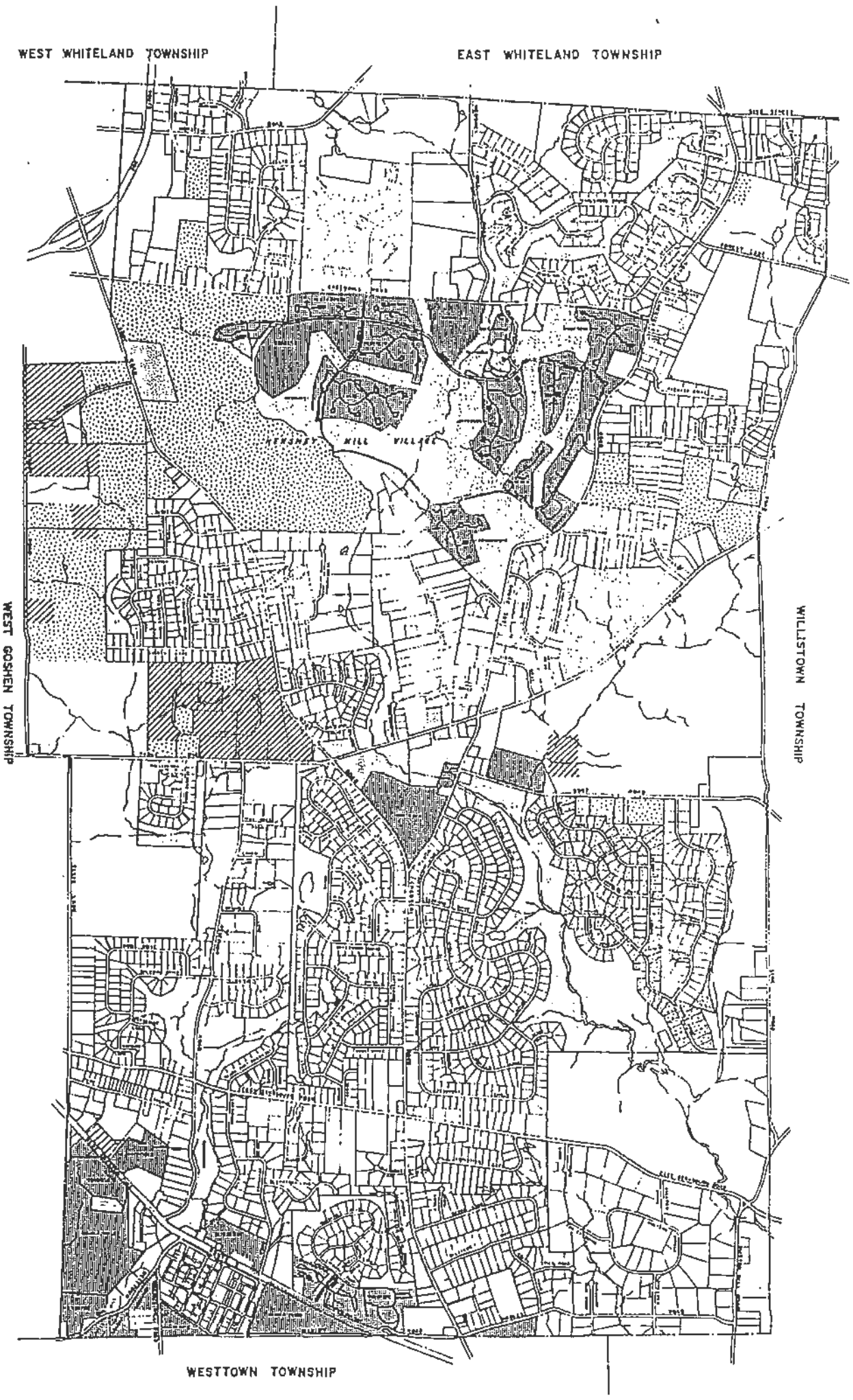
FIGURE A-1.

EXISTING LAND USE

- SINGLE FAMILY RESIDENTIAL
- MULTI-FAMILY RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- PUBLIC/QUASI-PUBLIC
- RECREATION and OPEN SPACE*
- UNDEVELOPED
- COMMITTED for DEVELOPMENT

*(INCLUDES TOWNSHIP AND PRIVATELY, i.e. HOME OWNERS ASSOCIATIONS OWNED LAND)

SOURCE: EAST GOSHEN TOWNSHIP
NOTE: EXISTING LAND USE BASED ON 1980 CONDITIONS.



EAST GOSHEN TOWNSHIP
CHESTER COUNTY, PENNSYLVANIA

COMPREHENSIVE PLAN

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28 BETHLEHEM PLAZA
BETHLEHEM, PENNSYLVANIA

EXHIBIT 4

developments within the Township. Hersheys Mill Village is depicted as a multi-family residential community even though most of the units developed there are attached single family dwellings. The present developed area of Hersheys Mill Village, one of the most predominant residential developments within the Township, shows the extent of development representing approximately 1,100 occupied units as compared with a projected total number of 2,032 dwelling units at the time of build-out or completion. The existing land use map is very helpful in depicting where those additional units might be located.

The industrial developed areas of the Township are also clearly shown with the Goshen Corporate Center, located north of Paoli Pike, being closest to a built-out condition. The Goshen Corporate Park West, located generally along Airport Road, is not yet fully developed but is expected to achieve build-out within ten years or less. Another vital source of information as contained in the 1992 Comprehensive Plan appears in Table 3.3.

TABLE 3.3

COMMITTED DEVELOPMENTS AS OF 1992
UNDER CONSTRUCTION BUT NOT FULLY OCCUPIED/BUILT OUT

DEVELOPMENT	ACRES	UNITS	ESTIMATED POPULATION
Waterford	33	26	64
Shassian	10	6	15
Wentworth	85	48	119
Mill Creek	35	33	82
Windermere	6	60 Apts.	148
Bellingham	15	209	334
Hersheys Mill			
(Lincoln)	7	25	62
(Merrifield)	7	27	67
(Newbury)	4	16	40
(Princeton)	17	69	170
	219	519	1,101

Source: 1992 Comprehensive Plan

This Table depicts developments which are committed by the Township as of 1992 and are under construction but are not fully occupied or built-out. These various developments include approximately 219 acres which represents 519 new dwelling units with an estimated population of 1,101 persons. Of the 519 proposed new dwelling units contained in Table 3.3, the Windermere development, the Bellingham development, and the Hersheys Mill developments listed would total 406 of the 519 dwelling units which are not single family detached dwellings.

Table 3.4 depicts five pending developments which have been committed as of 1992 but are not yet under construction. The source of this table is the 1992 Comprehensive Plan.

TABLE 3.4

COMMITTED DEVELOPMENTS AS OF 1992
NOT UNDER CONSTRUCTION

DEVELOPMENT	ACRES	UNITS	ESTIMATED POPULATION*
Bow Tree IV	213	169	417
Hayes/Blair	19	16	40
Saddlebrook	5	5	12
Miscellaneous	18	18	45
Hersheys Mill			
(Oakmont)	5	25	62
	260	233	576

* Based on 2.47 people per dwelling unit

Source: 1992 Comprehensive Plan

All of the units depicted in Table 3.4 represent single family detached dwellings except for the Hersheys Mill (Oakmont) development. According to this table, another 233 dwelling units will be added in the foreseeable future consuming an additional 260 acres of currently undeveloped land.

In summary, expected new development within the Township will affect approximately 65 percent of the remaining undeveloped land as depicted in Table 3.1 or about 860 acres. The future land use plans and the appropriate zoning requirements are discussed in the following section for this remaining undeveloped land.

3.2 Proposed Land Use and Zoning

East Goshen Township spent almost two years in developing the new 1992 Comprehensive Plan for the Township. This plan is well thought out and does not represent any radical departures from the existing zoning intentions which have been in effect for many years. Frequently, a Comprehensive Plan Update makes drastic changes and causes major changes in the Township's build-out potential. There are some innovative features of the new Comprehensive Plan which, in overlay format, will cause better development patterns for the remaining undeveloped land within the Township.

Exhibit 5, as taken from the 1992 Comprehensive Plan, describes A Plan for Future Land Use which appropriately balances an excellent mix of residential, commercial, industrial, and public/semi-public uses.

The following classes of use are recommended on Exhibit 5 for the future land use development of East Goshen Township:

Residential

- Low density suburban residential (one DU per acre)
- Low density open space suburban residential (1-3 DUs per acre)
- Medium density suburban residential (2-3 DUs per acre)
- High density suburban residential (4-14 DUs per acre)
- Urban residential (7-14 DUs per acre)

These five classes of recommended residential use compare favorably with the present zoning categories for the Township and are consistent with the build-out densities discussed in this report. The following commercial and office categories have been adopted within the 1992 Comprehensive Plan:

Commercial and Office

- Community commercial and local convenience commercial
- Planned highway commercial and business
- Government, finance, and office

These commercial and office uses are generally confined to the West Chester Pike corridor and to the Paoli Pike frontage between Boot Road and North Chester Road. The 1992 Comprehensive Plan recognizes that the predominant supporting commercial needs

FIGURE 1.

PLAN FOR FUTURE LAND USE

RESIDENTIAL

- LOW DENSITY SUBURBAN RESIDENTIAL (1 DU/AC)
- LOW DENSITY OPEN SPACE SUBURBAN RESIDENTIAL (1-3 DU/AC)
- MEDIUM DENSITY SUBURBAN RESIDENTIAL (2-3 DU/AC)
- HIGH DENSITY SUBURBAN RESIDENTIAL (3 - 14 1/2 DU/AC)
- URBAN RESIDENTIAL (3 - 14 1/2 DU/AC)

COMMERCIAL & OFFICE

- COMMUNITY COMMERCIAL and LOCAL CONVENIENCE COMMERCIAL
- PLANNED HIGHWAY COMMERCIAL and BUSINESS
- GOVERNMENT, FINANCE and OFFICE

INDUSTRIAL

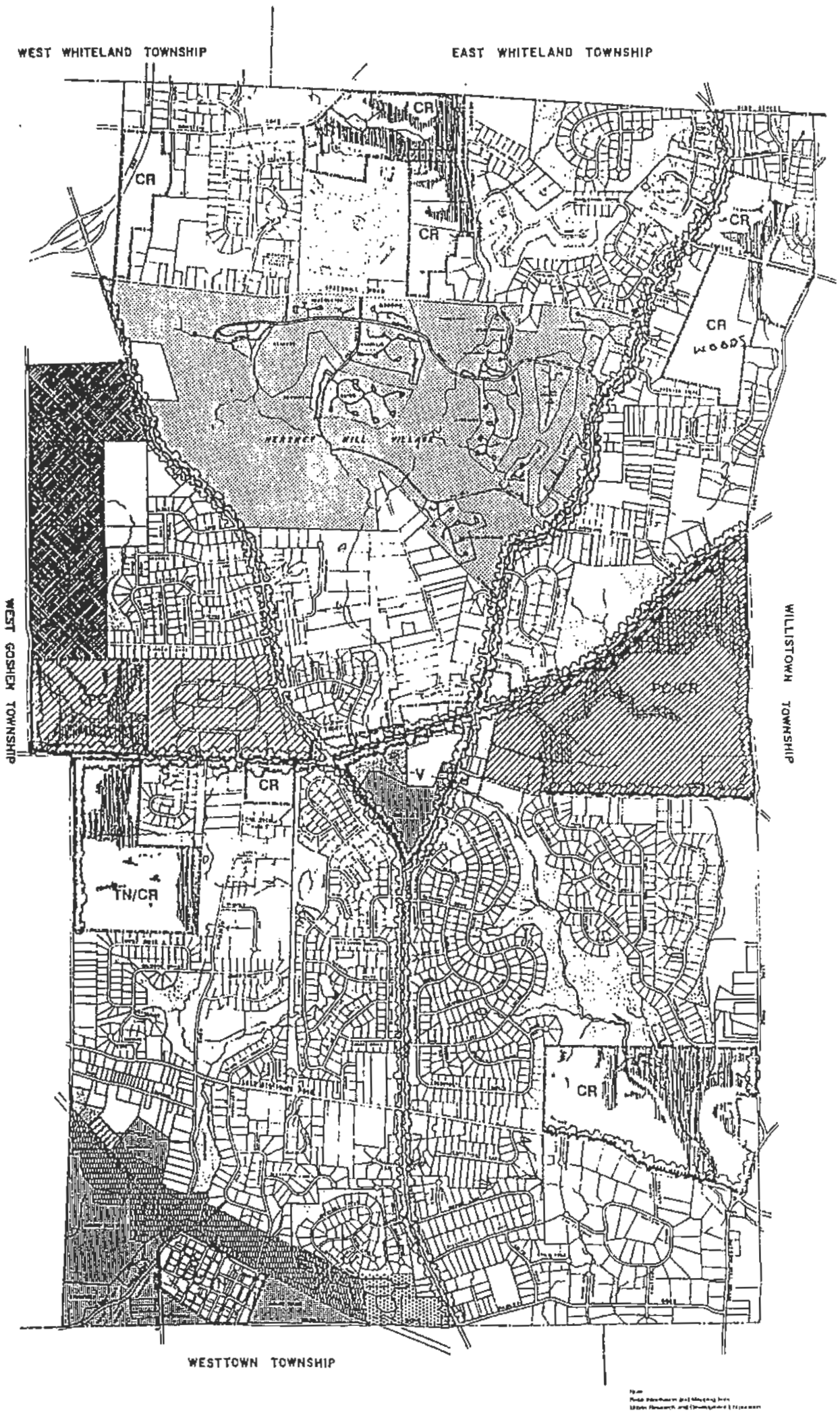
- PLANNED BUSINESS, RESEARCH, LIMITED INDUSTRIAL PARK, and RESIDENTIAL
- BUSINESS PARK
- LIGHT INDUSTRIAL

COMMUNITY FACILITIES

- OPEN SPACE CONSERVATION
- PARKLAND

OVERLAY AREAS

- CR — CLUSTER SINGLE-FAMILY RESIDENTIAL DEVELOPMENT
- TN — TRADITIONAL NEIGHBORHOOD
- PC — PLANNED CAMPUS DEVELOPMENT
- V — VILLAGE
- NATURAL RESOURCE PROTECTION AREAS ON UNDEVELOPED TRACTS
- GREENWAY BUFFER



EAST GOSHEN TOWNSHIP
CHESTER COUNTY, PENNSYLVANIA

COMPREHENSIVE PLAN

Thomas Comitta Associates, Inc.
Planning & Design Consultants

EXHIBIT 5

of the Township will continue to be served by the commercial corridor located in West Goshen Township extending west from the West Goshen Shopping Center. The following industrial uses have been adopted for both local and regional employment purposes:

Industrial

- Planned business, research, limited industrial park, and residential
- Business park
- Light industrial

The planned business, research, limited industrial park, and residential area is limited to the SmithKline Beecham property located south of Paoli Pike, north of Boot Road, and west of Line Road. This 312-acre parcel may be developed in the future for a combination of the above uses and cluster residential development the details of which are currently under study between the Township and SmithKline Beecham. Business park use is partially developed and consists primarily of the Goshen Corporate Park and the Hicks property. The balance of the light industrial uses planned for future growth in the Township include the Goshen Corporate Park West as depicted along Airport Road. The Comprehensive Plan also recommends the following open space and parkland uses:

Community Facilities

- Open space conservation
- Parkland

The Comprehensive Plan also recommends several unique Land Use Planning overlays which will be very helpful in achieving conservation oriented land use patterns as the Township approaches its potential ultimate build-out:

Overlay Areas

- CR - Cluster single family residential development
- Traditional neighborhoods
- Planned campus development
- Village development
- Natural resource protection areas on undeveloped tracts
- Greenway buffer

The above overlays must now be translated into a zoning format in order to preserve the remaining environmentally constrained areas not yet developed.

In summary East Goshen Township has adopted a forward thinking Comprehensive Plan which will allow ultimate build-out of remaining undeveloped areas in a most orderly fashion. Fortunately, the extent of resulting zoning changes required to implement the above Land Use Plan are minimal since the land use classes recommended are very consistent with present zoning except for the adoption of the above overlay districts.

EXISTING ZONING

East Goshen Township has followed a rigorous program of zoning implementation since the mid-1950s by carefully correlating the zoning classifications with the most recent Comprehensive Plan Land Use Updates. This has resulted in a high degree of land use/zoning conformity with minimal non-conforming development. The Township has continually updated or amended its Zoning Ordinance in accordance with changing conditions and changing needs for its residents.

Exhibit 6 depicts the official Zoning Map of East Goshen Township as last revised in October 1986. Two minor zoning district changes have occurred as follows:

- Expansion of the C2 Local Convenience Commercial District to include newly acquired land for the Township Municipal Building expansion.

- Rezoning from R2 to R3 Residential District for a small parcel located south of Morstein Road and west of U.S. Route 202.

The various classes of existing zoning districts are clearly depicted on Exhibit 5. With regard to permitted development densities, there are numerous options available within several of the districts depending upon the availability of public water and/or sewage facilities. The Township has recently adopted a new ordinance requiring that all residential construction (other than single family detached dwellings located on a lot of one acre or larger) be connected to a central, public water system.

Table 3.5, Summary of Existing Zoning Density Requirements, provides an overview of how the Township manages and regulates its existing and future development. It should be noted that there are provisions within the Ordinance, as amended, which allow for different area and bulk regulations which cannot be expressed in a summary table such as Table 3.5.

TABLE 3.5

SUMMARY OF EXISTING ZONING DENSITY REQUIREMENTS

ZONING DISTRICT	TYPE OF USE	MIN. LOT SIZE PER DU OR MAX. DENSITY	EQUIVALENT RESIDENTIAL DENSITY AND/OR MAX. BUILDING COVERAGE PERCENTAGE
RESIDENTIAL			
R-1	SFA/SFD/PRD	1.5-3.5 DUs/Acre	1.5-3.5 DUs/Acre
R-2	SFD	1.0 Acre	1.0 DUs/Acre
	SF Cluster(1)	25,000 sq. ft.	1.74 DUs/Acre(3)
	Other Uses	1.0 to 2.0 Acres	2.0 Acres/25%
	School	10.0 Acres	10.0 Acres/25%
R-3	SFD/Other(1)	18,000 sq. ft.	2.4 DUs/Acre
	SFSD	12,000 sq. ft.	3.6 DUs/Acre
	School	10.0 Acres	10.0 Acres/25%
	Church	2.0 Acres	2.0 Acres/25%
R-4	SFD	14,500 sq. ft	3.0 DUs/Acre
	SFSD	10,000 sq. ft.	4.3 DUs/Acre
	TH	5 DUs Acre	5 DUs/Acre
	APT	3,000 sq. ft/	14.5 DUs/Acre
	Other(1)	2.0 Acres	2.0 Acres/25%

TABLE 3.5 - Continued

ZONING DISTRICT	TYPE OF USE	MIN. LOT SIZE PER DU OR MAX. DENSITY	EQUIVALENT RESIDENTIAL DENSITY AND/OR MAX. BUILDING COVERAGE PERCENTAGE
RESIDENTIAL			
R-5	APT	3,000 sq. ft.	14.5 DUs/Acre
	TH	7 DUs/Acre	7 DUs/Acre
	SFSD	19,000 sq. ft.	4.3 DUs/Acre
	SFD	14,000 sq. ft.	3.1 DUs/Acre
	Other	14,000 sq. ft or 2 Acres	25%
COMMERCIAL	Gas Station	25,000 sq. ft.	20%
	All Other	18,000 sq. ft.	25%
C-2	All Uses	18,000 sq. ft.	30%
C-4	Offices/Banks	2.0 Acres	20%
	Other Uses	4.0 Acres	20%
	APT(1)	3,000 sq. ft.	14.5 DUs/Acre
C-5	All Uses	40,000 sq. ft.	25%

TABLE 3.5 - Continued

ZONING DISTRICT	TYPE OF USE	MIN. LOT SIZE PER DU OR MAX. DENSITY	EQUIVALENT RESIDENTIAL DENSITY AND/OR MAX. BUILDING COVERAGE PERCENTAGE
INDUSTRIAL			
1-1	Restaurant/Bank	2 Acres	30%
	Other Uses	4 Acres	30%
I-R(4)	SF Residential All Other Uses	1 Acre 10 Acres(2)	25% 25%
BP	All Uses	4 Acres	30%

SFD = Single Family Detached
SFSD = Single Family Semi-Detached
TH = Townhouse
APT = Apartments
(1) Refer to Conditional Use or Single Family Cluster Development
(2) Life Care Units at 2,500 sq. ft/unit permitted by Conditional Use
(3) The requirement for 40% open space will substantially reduce the 1.74 DUs/Acre to 1.0 DUs/Acre, or less.
(4) Amended by Ordinance No. 67-E-91

OFFICIAL ZONING MAP AMENDMENTS

JULY 30, 1965 - CHANGED C-4 AND R-4 BOUNDARY LINES ALONG ROUTE 3 EAST OF WATERVIEW ROAD. See Ordinance 67-8-65

OCTOBER 21, 1965 - ADDED R-4 DISTRICT ALONG SOUTH SIDE OF MANLEY ROAD EAST OF NORTH CHESTER ROAD. See Ordinance 67-0-65

BASE MAP ADDITIONS/REVISIONS

5/8/97	ADDED SUBDIVISIONS, ROADS, AND ROAD NAMES. DELETED NORTH HILLSIDE, BOSLOR, VALLEY VISTA, ET.	UPDC	
6/23/97	ADDED SUBDIVISIONS, ROADS, ROAD NAMES, AND IMPROVED CONDOMINIUM COMPLEX NAMES	UPDC	
6/23/97	ADDED LOT LINES	UPDC	

OFFICIAL
ZONING MAP

ZONING DISTRICTS

- **R-1** LOW DENSITY OPEN SPACE SUBURBAN RESIDENTIAL
- **R-2** LOW DENSITY SUBURBAN RESIDENTIAL
- **R-3** MEDIUM DENSITY SUBURBAN RESIDENTIAL
- **R-4** HIGH DENSITY SUBURBAN RESIDENTIAL
- **R-5** URBAN RESIDENTIAL
- **C-1** COMMUNITY COMMERCIAL
- **C-2** LOCAL CONVENIENCE COMMERCIAL
- **C-4** PLANNED HIGHWAY COMMERCIAL and BUSINESS
- **C-5** GOVERNMENT, FINANCE, and OFFICE
- **I-1** LIGHT INDUSTRIAL
- **I-R** PLANNED BUSINESS, RESEARCH, and LIMITED INDUSTRIAL PARK AND RESIDENTIAL
- **BP** BUSINESS PARK
- ALLUVIAL SOILS (Approximate Locations Only)*
- 100 YEAR FLOOD AREA (Approximate Locations Only)*

*Sources of Alluvial Soils and 100 Year Flood Area

Flood Insurance Study
Township of East Goshen
Chester County, Pennsylvania
by
U. S. Department of Housing and Urban Development
Federal Insurance Administration
January, 1977

Chester and Delaware Counties Soil Survey
U. S. Department of Agriculture
May, 1961

THE OFFICIAL ZONING MAP IN THE TOWNSHIP BUILDING SHALL BE THE FINAL AUTHORITY REGARDING THE CURRENT ZONING STATUS OF LAND,BUILDINGS AND OTHER STRUCTURES.

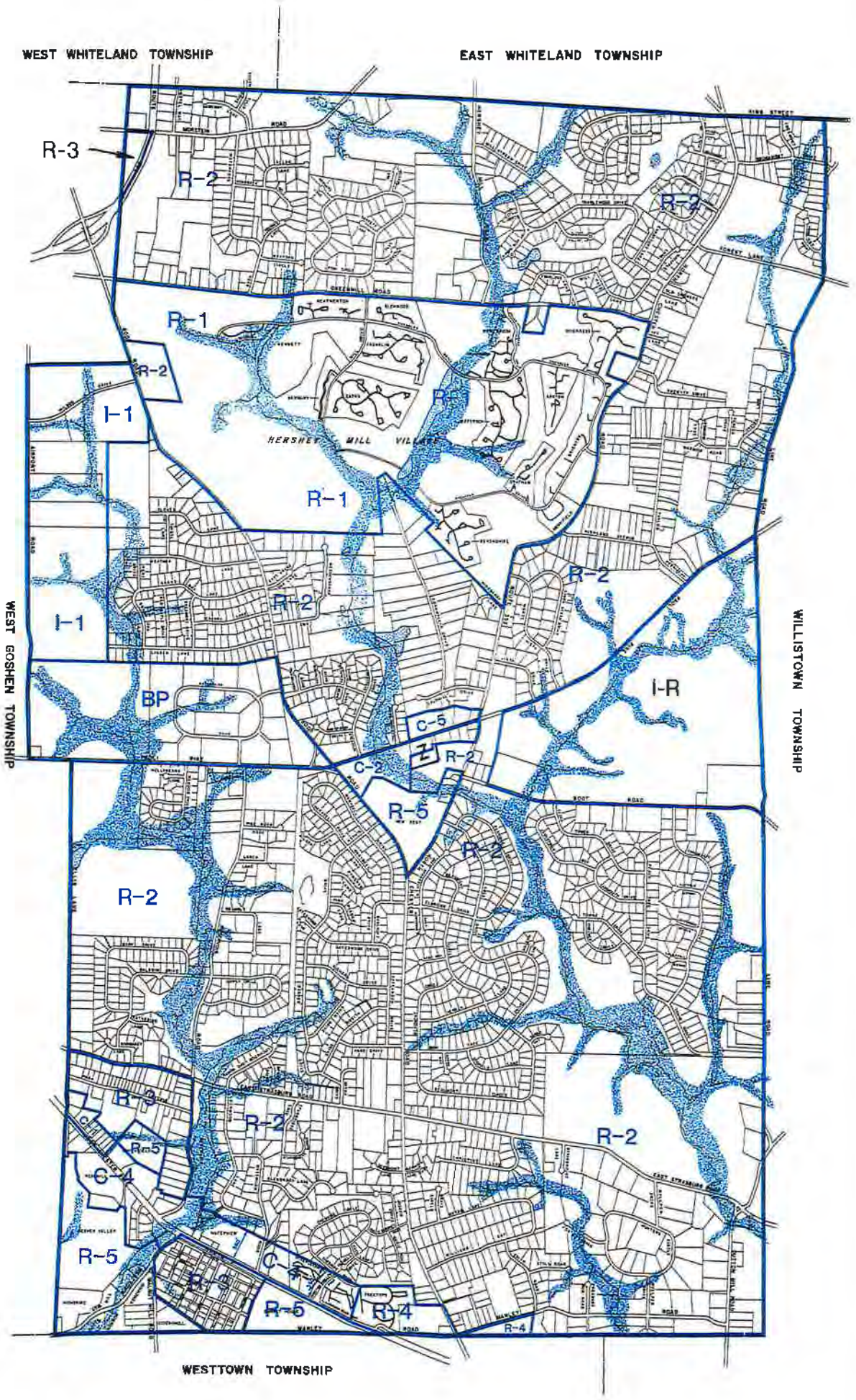
THIS IS TO CERTIFY THAT THIS IS THE OFFICIAL ZONING MAP

CHAIRMAN, BOARD OF SUPERVISORS — DATE

SECRETARY - TREASURER — DATE

TOWNSHIP SEAL

ADOPTED SEPTEMBER 20, 1963



EAST GOSHEN TOWNSHIP
CHESTER COUNTY, PENNSYLVANIA

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EXHIBIT 6

Virtually all development contemplated by or covered by the Township Zoning Ordinance is expressed in Table 3.5 either by a stipulated density of dwelling units per acre, or by the minimum lot size established. Where possible, the equivalent number of residential dwelling units per acre have been listed in the last column of Table 3.5 to bring all residential development to one common denominator expressed in dwelling units per acre.

Single family detached residential cluster options are available in both the R2 and the R4 Residential Districts. This option can be useful in the R2 District but not necessarily as useful in the R4 District where the basic minimum lot size of 14,500 square feet per DU is substantially less than the 25,000-square foot minimum lot area for single family cluster developments.

The density and development parameters shown in the last column of Table 3.5 have been used in forecasting EDUs for future growth area. it is expected that there will be future amendments to the Zoning Ordinance to accommodate the new overlay areas recently adopted as a part of the 1992 Comprehensive Plan.

3.3 Growth Areas and Population Projections

The future growth areas within East Goshen Township include numerous projects which have already commenced development but which are not yet complete and future developments which have not yet been submitted to the Township for purposes of subdivision or land development approval and/or for the purposes of sewage facilities planning. For example, Bow Tree Farms, Section IV, is already approved and sewage treatment commitments have been made; therefore, projects which have been committed are not discussed in this section.

The locations within the Township where new growth or expansion of present growth can occur are listed below:

- Price Property - 130 acres - Paoli Pike at Ellis Lane
- Reservoir Road Vicinity - approximately 53 new dwelling units possible from subdivided properties
- Fire House Property Development - 13 acres for development
- Fedor Property - West Chester Pike - approximately 175 apartments or townhouses
- Miscellaneous West Chester Pike Properties - 12.9 acres
- Balance of the Hicks Property including the milk store - approximately 76 acres

- SmithKline Beecham Property - preliminary subdivision plan approval granted August 1991 - plan withdrawn

- The Woods Property near Forest Lane - approximately 86 acres

- The Sherman Property near Forest Lane - approximately 38 acres

- The Grace Estate Property at Strasburg and Line Roads - development intentions not identified

As noted in the 1992 Comprehensive Plan, there may also be additional "infilling" of existing properties which because of their present size are capable of further subdivision and development activity. The Updated Act 537 Plan has attempted to recognize such development potential except for the Grace Estates for which there is no known development intention.

Population Projections

The projected ultimate population for the Township has been previously discussed in Section 1.4 of this report. Specifically, Table 1.4.3 describes an estimated projected ultimate population of 21,434 persons of which 4,619 persons would ultimately reside on land parcels which are not yet committed for development or subdivision activity. It is most likely that East Goshen Township will reach its ultimate population during the time frame 2001-2010. The rate of future Township growth and the expansion of the present population will be dependent in part on economic conditions, the market absorption rate for new dwelling units within the Township and, to some degree, the ability to expand existing sewage treatment facilities.

3.4 Five-Year (1993-1997) Sewage Expansion Areas

This section covers the anticipated sewage needs and the areas requiring expansion of sewage service for East Goshen Township during the period 1993 to 1997 (the five-year planning area). The sewage treatment needs are broken down into the two separate watersheds. The first is the Chester Creek Watershed where all existing and projected sewage needs are treated at the West Goshen Sewage Treatment Plant.

Chester Creek Sewage Flows (West Goshen Sewage Treatment Plant)

The long-standing agreement between East Goshen Township and West Goshen Township allows 1.0 MGD of actual sewage flow to be treated by West Goshen. During 1991 and 1992, all such sewage flow has been carefully monitored and checked by each Township. The results indicate that approximately 77.4 percent of

theoretical flow (based on EDU allocations) actually reaches the West Goshen STP.

Table 3.6, Allocation of Sewage Flow to West Goshen Sewage Treatment Plant, dated October 28, 1992, describes the status of theoretical sewage flows which are on-line as of the date of this report. In addition, the estimated sewage flows which are now committed but in the process of being connected are also depicted in column 2 of Table 3.6.

The third column 2 of Table 3.6 describes the probable connections to be made during the period 1993 to 1997.

It must be noted that the East Goshen Township Sewage Administration Office carefully monitors the status of all sewage connections including the comparison of actual on-line flows versus the theoretical flows and any variations in this ratio to assure that the daily flow to the West Goshen STP does not exceed the 1.0 MGD agreement factor.

The existing areas of the Township which have been provided with reserved sewage capacity and which might be developed within the five years include the following:

o Park Avenue - Goshen Fire Company - 13 acres -	7,000 gpd
o Fedor Property West Chester Pike - 175 apartments -	35,000 gpd
o West Chester Pike - miscellaneous R5 connections - 7.3 acres -	7,700 gpd
o West Chester Pike - C4 Commercial area - 12.9 acres -	7,500 gpd
o Hicks Property - 14.9 acres - Tax Parcel 53 - 3-1.2B -	4,544 gpd
Total	61,744 gpd

Careful comparison of the current theoretical gallons per day on-line to the West Goshen STP reflects a total of 974,599 gallons and an additional 88,295 gpd committed and in progress for connections. With the addition of 61,744 gallons expected during the period 1993-1997, the aggregate daily theoretical flow would be 1,124,638 gpd. However, it is expected that the continued monitoring of the above aggregate flows would be approximately 79 percent or approximately 884,306 gpd at the end of the 1997 planning cycle. The increased ratio between current theoretical and real flow will be increased because of

TABLE 3.6
ALLOCATION OF SEWAGE FLOW TO
WEST GOSHEN SEWAGE TREATMENT PLANT
OCTOBER 28, 1992

AREA TO BE SERVED	ZONED	GPD ON LINE	GPD COMMITTED & IN PROGRESS	1993–1997 PROBABLE	1998–2002 PROBABLE	POTENTIAL 2002 >
ARDLEIGH ESTATES (8 SFD)	R–2		2,800			
BITTERSWEET	R–2	17,150				
GRAND OAK	R–2	49,350				
MARYDELL	R–2	55,650				
MILLCREEK ESTATES	R–2	2,450	9,100			
PIN OAKS	R–2	39,200				
MISAK DR. EXTENSION	R–2	1,400	1,400			
MEADOWS	R–2	12,250				
ROCKLAND VILLAGE	R–2	25,900				
SUPPLEE VALLEY	R–2	34,300				
HICKORY GLEN	R–2	3,250				
WATERVIEW	R–2	23,100				
RESERVOIR ROAD	R–2	700	700			18,600
PRICE PROPERTY (129.6 ACRES)	R–2				17,500	27,650
STRASBURG ROAD	R–2	14,875				
ELLIS LANE	R–2	1,400	1,750			
STURBRIDGE	R–2	3,150				
BRANDOLINI/MORSTEIN RD. (9 SFD)	R–3		3,150			
HILLOCH MANOR (7 SFD)	R–2	2,450				
WHITE CHIMNEYS (CHESTER HOLLOW – 71 SFD)	R–2	24,850				
WENTWORTH (12 SFD)	R–2	700	3,500			
GOSHEN HEIGHTS	R–2	24,500				
PARK AVENUE	R–3	12,250				
FIRE HOUSE (13 ACRES)				7,000	9,517	
FEDOR (175 APTS.)	R–4			35,000		
TREE TOPS (200 APTS.)	R–4	40,000				
HIGHSPIRE (78 TOWNHOUSES)	R–4	19,500				
DUTT'S MILL (33 UNITS)	R–5	4,500	3,750			
GOSHEN VALLEY (656 APTS/TH)	R–5	171,500				
RIDGEWOOD APTS (60 UNITS)	R–5	12,000				
WALNUT HILL ROAD (4 SFD)	R–5	1,400				
AUDUBON (35 UNITS)	R–5	8,750				
SMITHFIELD APTS. (198 UNITS)	R–5	39,600				
MISCELLANEOUS (7.3 ACRES)	R–5			7,700		
WEST CHESTER PIKE (9)	C–1	3,150				
STEEPLECHASE (81 TOWNHOUSES)	C–1	20,250				
ROSE HILL APTS (166 UNITS)	C–4	33,200				
ROSE HILL COMMERCIAL	C–4	8,000				
RACQUET CLUB APTS. (71 UNITS)	C–4	14,200				
WATERVIEW APTS. (203 UNITS)	C–4	40,600				
COMMERCIAL (3)	C–4	7,000				
WEST CHESTER PIKE (12.9 ACRES)	C–4	8,850		7,500		
GOSHEN CORPORATE PARK *	BP/I–1	30,609	9,391			
GOSHEN OFFICE ASSOCIATES	BP/I–1	3,000				
HICKS *** (GOSHEN CORP. PARK WEST) 93.3 ACRES	I–1	4,913	22,192			
13.5 ACRES (53–3–1.2) COMMONS AT GOSHEN	I–1	4,200				
14.9 ACRES (53–3–1.2B)	I–1			4,544		
11.8 ACRES (53–3–1.7/MILKSTORE)	BP	573	3,026			
HICKS – BALANCE (34.8 & 36.7 ACS.)	BP				21,807	
BRANDYWINE INDUSTRIAL PARK						
MARS*	BP/I–1	13,114	9,386			
CALECO*	BP/I–1	615				
(BRANDYWINE PLAZA) WILSON PROP.	BP/I–1		10,800			
STS. PETER AND PAUL CHURCH	R–2				1,150	
GREEN ACRES (3 SFD)	R–2				1,050	
STRASBURG/ROUTE 352 (20 SFD)	R–2				7,000	
PUMPED FROM RIDLEY CREEK						
HERSHEY MILL ESTATES	R–2	50,000				
FAIRWAY VILLAGE	R–2	13,300				
ASHBRIDGE/FIRETHORNE (170 SFD)	R–2	59,500				
WYLLPEN (17 SFD)	R–2	700	5,250			
HUNTER'S RUN (8 SFD)	R–2	700	2,100			
WINDEREMERE (60 APTS.)	R–4	12,000				
CHARTER CHASE	R–2				32,550	
MILL VALLEY	R–2				8,750	
MILLSTREAM DRIVE	R–2				8,750	
TOTALS		974,599	88,295	61,744	108,074	46,250

1991 AVERAGE DAILY FLOW 754,769
(W.G. NUMBER)
% TOTAL ON–LINE VS. ACTUAL GPD = 77.44%

FACTORS USED:
SFD = 350 GPD/APT. = 200 GPD/T.H. = 250 GPD

certain commitments made by the Township which are based on gallons and not standard EDU flows. Please note that the potential additional connections for the next five-year planning cycle (1998 to 2002) are discussed in the next section of this plan but utilizing the same information as depicted on Table 3.6. Please refer to 1994 Addendum at the end of this section which refers to a new "West Goshen Alternative" not previously discussed or analyzed in this section.

Expected New Service Areas for the Ridley Creek Sewage Treatment Plant

Table 3.7 depicts the allocation of sewage flow to the Ridley Creek Sewage Treatment Plant as of October 28, 1992. The East Goshen Township Sewage Administration also monitors on a monthly basis all connections which have been placed on-line and those which are committed and in progress or various stages of construction.

As of October 28, 1992, the theoretical flow connected to the Ridley Creek Plant totaled 333,127 gpd. Other commitments which have been made by the Township, which are in the process of being constructed, or consist of future construction approved by the Township includes a total of 157,400 gpd reflected in column 2 of Table 3.7 (plus the Spinozzi and McCloskey reserved connections which are committed but not paid).

It must be noted that the monitored daily/monthly average flows reflect approximately 69.2 percent of the theoretical on-line flows. Accordingly, the on-line flows and the committed flows in progress for connection would total 490,527 gpd (theoretical flow) whereas the estimated actual flow, when such connections are completed, will be approximately 349,363 gpd, based upon actual gallons committed and EDUs committed. If the new Kent Apartment connection is removed from the Ridley Creek STP and redirected to the West Goshen STP, this would reduce the Ridley Creek STP flow noted above by 84,420 gpd.

The areas of the Township and areas external to the Township which might be connected to the Ridley Creek Plant during the five-year sewage planning cycle (1993-1997) include the following:

- Spinozzi & McCloskey Properties - 5 EDUs - connections can be made only when Taylor Highland receives public sewers — 1,750 gpd
- Bryn Mawr Rehabilitation Hospital - Willistown Township - — 40,000 gpd

o	Christ Memorial Lutheran Church - Willistown Township -	1,000 gpd
	Total	42,750 gpd

Based on the above possible additions, the aggregate on-line sewage flow in combination with the committed additional sewage flow and the probable 1993-1997 flow total 533,277 gpd (theoretical) and an estimated true flow of approximately 391,573 gpd. There are two other areas of the Township depicted in Table 3.7 within the column noting committed sewage capacity in progress. These areas include the Meadowbrook/Cornwallis area which is being designed for 76 EDUs and an estimated theoretical flow of 26,600 gpd. The other area scheduled for the design of public sewer extensions is the Taylor Highland area covering 64 EDUs which committed are at 22,400 gpd. Section 2.3 of this plan and Section 4.5 of this plan cover the urgency of need regarding these areas of East Goshen Township.

Also shown in the committed and in progress column of Table 3.7 is a 30,000 gpd reservation for SmithKline Beecham. It must be noted that SmithKline Beecham (SKB) has already purchased 40,000 gpd in sewage treatment capacity at the Ridley Creek plant and SKB also has an option to purchase 12,000 gpd in additional capacity. This option has now expired. The inclusion of the 30,000 gpd and the status of the future dates of connection will be totally dependent upon future development plans to be formulated and submitted to East Goshen Township. At the time of publication of this report, there are no pending construction plans for any sewage capacity beyond the existing 10,000 gpd now on-line. Since SmithKline Beecham has withdrawn its approved subdivision plan, the 55,000 gpd shown in Table 3.7 could be eliminated at this time for treatment at the Ridley Creek STP.

Subsequent to the publication of the original draft of this Act 537 Update, Immaculata College directed a letter to East Goshen Township requesting that the Township consider sewage treatment for approximately 137,000 gpd (with 132,000 gpd of this projected flow being in the Valley Creek Watershed) to service major portions of the college facilities. Immaculata College is located in the Valley Creek Watershed in East Whiteland Township. Table 3.7 in this report shows a future reservation of only 5,000 gpd for Immaculata College which would occur after the year 2002. Apparently, East Whiteland Township has indicated to Immaculata College that it cannot handle the college's wastewater needs. Although it would be very costly to divert the Immaculata College wastewater flows to East Goshen Township, this may be a need which must be recognized under the new "West Goshen Alternative" discussed as an Addendum to this section.

TABLE 3.7
ALLOCATION OF SEWAGE FLOW TO
RIDLEY CREEK SEWAGE TREATMENT PLANT
OCTOBER 28, 1992

AREA TO BE SERVED	ZONED	GPD ON LINE	GPD COMMITTED & IN PROGRESS	1993–1997 PROBABLE	1998–2002 PROBABLE	POTENTIAL 2002 >
BOW TREE FARMS (496 SFD)	R–2	115,500	52,200	*		
VISTA FARMS (65 SFD)	R–2	22,750				
HUNT COUNTRY (71 SFD)	R–2	24,850				
WENTWORTH (65 SFD)	R–2	14,000	8,750	*		
E.G. ELEMENTARY SCHOOL	R–2	10,000				
S.K. BEECHAM	I–2	10,000	30,000	*	55,000	**
GOSHEN VILLAGE COMMERCIAL	C–5	13,000				
HANCOCK BUILDING (FUCHS)	C–2	3,600				
PHASE II – HANCOCK BUILDING			2,400	*		
PAOLI PIKE – 352/PAOLI CORNER	C–5	5,950	350	*		
TAYLOR/HIGHLAND (64 EDU)	R–2		22,400			
SPINOZZI & MCCLOSKEY (10 EDU)	R–2			1,750	1,750	
COVENTRY WOODS (16 EDU)	R–2		5,600			
WATERFORD (26 EDU)	R–2		9,100			
MEADOWBROOK/CORNWALLIS AREA	R–2		26,600			
BELLINGHAM LIFE CARE	I–2	28,000				
BENTLEY CONSTRUCTION	C–5	900				
PHILA. SUB. – HUNT COUNTRY		157				
NEW KENT		84,420				
WOODS PROPERTY (85.9 ACRES)	R–2				30,100	
WILLOW POND (28 SFD)	R–2				9,800	
INDIAN HILLS ***	R–2					15,050
SHERMAN PROPERTY (37.8 ACRES)	R–2				12,950	
BROOKMONT/TREMONT	R–2					15,400
N. CHESTER RD. MISC. (82 SFD)	R–2					28,700
OLD ORCHARD/IVY/RAEWYCK						10,150
WILLISTOWN TOWNSHIP						
BRYN MAWR REHABILITATION				40,000		
CHRIST MEMORIAL LUTHERAN CHURCH				1,000		
EAST WHITELAND TOWNSHIP						
WM. HENRY APTS.					59,000	11,000
IMMACULATA COLLEGE						5,000
TOTALS		333,127	157,400	42,750	168,600	85,300

TOTAL ON LINE/COMMITTED/PROBABLE 701,877

AVG. 1992 PLANT FLOW = 230,475
230,475/333127 = 69.19%

* COMMITTED AND PAID FOR

** INCLUDES 12,000 GPD OPTION

*** IF WOODS/WILLOW POND AREAS ARE CONNECTED

FACTORS USED:
SFD = 350 GPD/UNIT
APT = 200 GPD/UNIT

Summary of Sewage Expansion Plans for 1993-1997

Most of scheduled "committed and in progress" connections will probably be made during the 1993 to 1997 planning cycle. In addition, approximately 61,744 gallons of new sewage flow could be generated for the West Goshen Treatment Plant. Please refer to 1994 Addendum contained at the end of this section.

Regarding the Ridley Creek Sewage Treatment Plant, most of the "committed and in progress" connections will probably be made during the five-year planning cycle 1993-1997. However, the EDUs reserved for Spinozzi and McCloskey will be made only upon need. Further, any external connections made for facilities located in Willistown Township will be considered when approval is received to expand the Ridley Creek Treatment Plant beyond its present committed capacity of 400,000 gpd.

3.5 Ten-Year (1998-2002) Sewage Expansion Areas

Again, referencing Table 3.6 which describes the allocation of sewage flows to the West Goshen STP, the fourth column of this table describes potential properties which might be connected during the next five-year planning cycle. These areas include:

o	The Price Property - 129.6 acres - approximately 50 EDUs now and 79 EDUs at a later date	17,500 gpd
o	Park Avenue - Goshen Fire Company Property	9,517 gpd
o	Hicks Property - The balance of 34.8 and 36.7 acre parcels	21,807 gpd
o	Sts. Peter and Paul Church (upon need)	1,150 gpd
o	Green Acres - 3 EDUs	1,050 gpd
o	Strasburg/Route 352 - approximately 20 EDUs	7,000 gpd
o	Charter Chase Subdivision - 93 EDUs	32,550 gpd
o	Mill Valley Area - 25 EDUs	8,750 gpd
o	Mill Stream Drive - 25 EDUs	8,750 gpd
	Total	108,074 gpd

Ridley Creek Sewage Treatment Plant

The fourth column of Table 3.7 describes the probable expansion of public sewers and or new connections to the Ridley Creek STP during this five-year planning cycle as follows:

o SmithKline Beecham - estimated 55,000 gpd (estimated by SKB consultants). This need can now be eliminated.	55,000 gpd
o Spinozzi & McCloskey - balance of 5 EDUs - upon need	1,750 gpd
o The Woods Property - 85.9 acres - dependent on new sewer construction for adjacent areas	30,100 gpd
o Willow Pond - 28 EDUs - existing community system - dependent on other area sewer extensions	9,800 gpd
o The Sherman Property - 37.8 acres - dependent on new sewer construction on adjacent areas	12,950 gpd
o William Henry Apartments - East Whiteland Township - totally dependent upon approval to expand Ridley Creek STP or divert to West Goshen STP	59,000 gpd
Total	168,600 gpd
(less SKB)	-55,000 gpd
	113,600

Summary

The probable connections during the period 1998 to 2002 for the West Goshen Sewage Treatment Plant total 108,074 gpd and the probable expansion areas and/or new connections for the Ridley Creek Sewage Treatment Plant total 168,600 gpd for the same five-year planning cycle. The above figures could be substantially revised based upon the new "West Goshen Alternative" discussed in the Addendum at the end of this section.

It must be noted that the expansion areas discussed in this section for the year 1998 to the year 2002 could move forward by five years based upon need, or could be delayed beyond the year 2002 if the anticipated needs do not develop. For example, the immediate development of the 129.6-acre Price property at Paoli Pike and Ellis Lane could result in the immediate need for

approximately 129 EDUs or 45,150 gpd for the Chester Creek/West Goshen STP.

In a similar fashion, the existing onlot conditions within the Charter Chase subdivision may actually improve under the Township Onlot Sewage Facility Management Program which could delay public sewer connections for Charter Chase beyond the year 2002 or if conditions improve sufficiently could negate the need for extending public sewers to Charter Chase. A constant monitoring of on-going sewage needs for the municipality and the urgent needs within areas immediately adjacent to the Township boundaries is required.

3.6 Sewage Expansion Areas Beyond Year 2002

Table 3.6 also contains a fifth column which depicts two possible sewage service areas beyond the five and ten-year planning cycles. For the Chester Creek/West Goshen STP, there are approximately 53 EDUs along Reservoir Road which might require eventual public sewer connections if existing onlot systems exhibit malfunctions over the next ten years. In addition, the balance of the development of the Price property located at Paoli Pike and Ellis lane would probably be developed beyond the five-year and ten-year planning cycles. A reservation of 79 EDUs or 27,650 gpd has been noted for such potential future development. These two areas would add approximately 46,250 gpd to the West Goshen STP.

With regard to ultimate future sewage treatment at the Ridley Creek STP as shown in Table 3.7, appropriate reservations have been made in future years for the Indian Hills area of the Township containing approximately 43 EDUs. However, this would be totally dependent upon sewer connections being made to the Willow Pond area and adjacent properties which may or may not occur. In addition, the Brookmont/Tremont area contains approximately 44 EDUs which should be considered for future sewer service when and if public sewers are needed in this area.

Along North Chester Road, the are approximately 82 miscellaneous single family detached EDUs which could be considered for future sewer service and totalling an addition of 28,700 gpd to the Ridley Creek Treatment Plant. Also, the Old Orchard/Ivy/Raewyck area has approximately 29 EDUs which should be considered for extension of public sewers if the existing onlot systems exhibit malfunctions.

In correspondence with the Township, the management of the William Henry apartment complex has indicated that if the Ridley Creek STP is allowed to expand and if the apartment complex is permitted to connect to the East Goshen Sewer system, then additional land at the apartment complex could be developed

contributing an additional 11,000 gpd over and above the 59,000 gpd previously requested in writing from this group.

Also, Immaculata College has indicated to East Goshen Township that it might have future sewage treatment needs comprising approximately 5,000 gpd which could be considered if the above stated assumptions for Ridley Creek STP expansion and external Township service are approved.[1]

The above areas, if ultimately approved for connection to the Ridley Creek STP, would contribute an additional 85,300 gpd. The bottom line totals for sewage flow to the West Goshen STP including on-line, committed, the two five-year planning cycles extending from 1993 to the year 2002, and, the future potential connections beyond 2002 would bring the total theoretical flow to Chester Creek to a figure of 1,278,962 gpd. If the same ratio of actual flow versus theoretical flow is maintained for residential EDUs (77.4 percent), and the gallons of sewage treated are maintained per the developer agreements, the ultimate aggregate flow to the West Goshen STP would be 1,008,994 gpd. Please refer to 1994 Addendum contained at the end of this section.

In a similar calculation for the Ridley Creek STP, and assuming that approvals are received to expand this plant to 700,000 gpd, the aggregate flows at present and into the 21st century would be 787,177 gpd (theoretical flow) with an estimated actual flow of 607,299 gpd. If further consideration is given to the November 1992 request from Immaculata College for an additional 132,000 gpd to be treated at the Ridley Creek STP, the ultimate total for the estimated actual flow could be as high as 739,299 gpd.

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[1] Correspondence received by East Goshen Township in November 1992 suggests that the <u>total request</u> for Immaculata College sewage treatment is 137,000 gpd and not 5,000 gpd as previously reported.

1994 ADDENDUM
AMENDING SECTION 3.0, FUTURE GROWTH,
AND 5- AND 10-YEAR SEWAGE EXPANSION PLANS

After completion of the East Goshen Act 537 Plan Update dated December 1992, copies of this document were circulated to each surrounding Township and to the Chester County Planning Commission and Chester County Health Department. During the spring of 1993, both County agencies suggested further exploration of a spray irrigation alternative to the proposed expansion of the Ridley Creek STP using stream discharge methods. Willistown Township, in its review of the same draft, strongly urged that East Goshen Township look at other alternatives to the proposed 0.3 MGD expansion of the Ridley Creek STP, using stream discharge.

During late June 1993, a meeting was convened at the PaDER offices regarding a number of matters. At this time, the PaDER representatives also suggested to the East Goshen officials present that stream discharge of any additional effluent at the Ridley Creek STP would be difficult if not impossible to obtain. A spray irrigation alternative was again suggested.

The Township has investigated a spray irrigation alternative for the 0.3 MGD discharge at the Ridley Creek STP as reported in the Addendum to Section 4 of this updated plan. The cost factors and other problems related to major wetland intrusions makes spray irrigation an unacceptable alternative for East Goshen Township.

In August 1993, the Consultant to the West Goshen Municipal Authority and West Goshen Board of Supervisors provided a letter to the Manager of East Goshen Township outlining the availability of all or portions of up to 780,000 gpd in future sewage treatment capacity. This offer was predicated upon current expansion plans now contemplated by West Goshen Township and its Municipal Authority.

In September 1993, a letter was directed from East Goshen Township to the Consultant for West Goshen Township expressing interest in all of the available 780,000 gpd in future capacity. No written response has been received as of May 1994. However, this offer and this possibility presents a new alternative which is hereafter identified in this Updated Plan as the "West Goshen Alternative." The letter from East Goshen Township to the West Goshen Consultant accepting all of a major part of the 780,000 gpd was predicated upon: 1) confirming the interest of potential users by way of detailed discussions; 2) developing the cost feasibility of the transfer of the wastewater to the Chester Creek basin; 3) developing specific cost factors for the additional capacity which would be cost effective; and

4) verifying that East Goshen's trunklines would be capable of handling the additional wastewater flows.

East Goshen Township is anxious to conclude its Act 537 Plan update and without further commitment from West Goshen Township will not spend additional funds to develop any feasibility studies for the West Goshen Alternative. If and when a commitment is received from West Goshen Township, a supplement to the Act 537 Plan Update will be submitted to PaDER.

4.0 PLANNING AND FACILITIES ALTERNATIVES, EXPANDED FACILITIES, AND SEWAGE MANAGEMENT OPTIONS

4.1 Areas Requiring Public Sewer Connections - 1993 to 2002

4.1.1 Chester Creek Drainage Area (West Goshen STP) Alternatives for the Five-Year Planning Period 1993-1997

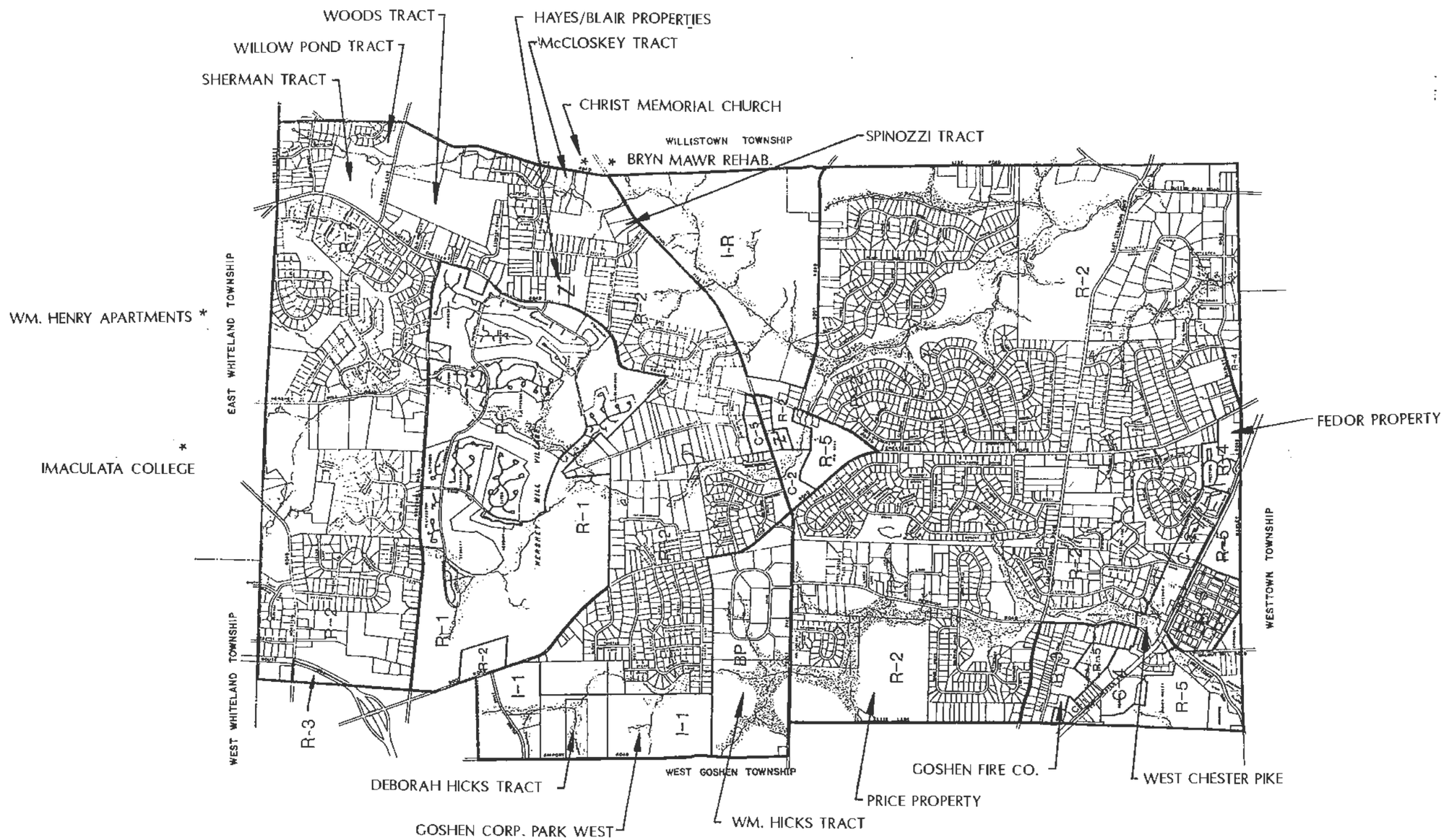
Table 3.6 in the preceding section identifies 15 existing developments, or areas titled "Committed/In Progress", which were previously committed for connection to the West Goshen STP. These facilities are expected to be connected to the public sewer system during the period 1993-1997 and are not subject to any further alternative sewage facility analysis.

Table 3.6 also identifies five additional areas titled "Probable" which represent future potential public sewer connections during the period 1993-1997. The alternatives for these five areas are discussed immediately below:

Park Avenue - Goshen Fire Company Property. This property contains 13 acres, is zoned for R-3 Residential use, and has a future potential under present zoning for the generation of 16,517 gpd in sewage flow. There are no immediate plans for development of this property which is currently used as open space and is used as the site of the Goshen Country Fair. Onlot sewage disposal is not recommended as a viable alternative in view of the permitted density available under the R-3 zoning options. Approximately 7,000 gpd in sewage flow has been reserved for the period 1993-1997 with the balance representing 9,517 gpd in future sewage flow being reserved for the period 1998-2002.

Fedor Property - West Chester Pike Corridor. This property is currently zoned R-4 Residential and has the maximum potential for approximately 175 apartments. There are no pending development plans for this site. However, it is expected that the property could be developed prior to 1997, and thus 35,000 gpd in sewage flow is reserved to service the facility when developed. The permitted density under the R-4 zoning district would mandate connection to public sewers. Therefore, onlot sewage facility alternatives are not feasible for the subject property.

UPDATED ACT 537 WASTEWATER
FACILITIES PLAN
DECEMBER 1992
EAST GOSHEN TOWNSHIP



AREAS DISCUSSED FOR PUBLIC SEWER NEEDS

1993-2002

EXHIBIT 4-0

Miscellaneous High-Density Residential. Within the West Chester Pike Corridor, there are 7.3 acres of miscellaneous land zoned for R-5 Urban Residential use which mandates connection to a public sewer system. Therefore, 7,700 gpd in sewage flow has been reserved for such development which is expected to occur prior to 1997. The permitted density and the location of this property indicate that onlot sewage alternatives would not be feasible if the property is developed as zoned. Therefore, a public sewer connection appears to be the only realistic alternative.

West Chester Pike Commercial Properties. There are 12.9 acres of undeveloped property in the C-4 Commercial district along the West Chester Pike Corridor. It is estimated that these properties would contribute approximately 7,500 gpd in sewage flow when developed. It is expected that the majority of this property would be developed prior to 1997. Onlot sewage management alternatives do not appear to be feasible and public sewer connections are available within the vicinity.

Deborah Hicks Property. It is estimated that this 14.9 acres of the Hicks property could be developed during the period 1993-1997 which would require approximately 4,544 gpd in additional sewage flow. This property is zoned I-1 Light Industrial and would require connection to the public sewer system.

Summary. In addition to the 15 properties or developments already committed and in progress, as reflected on Table 3-6, if the above five areas are developed prior to 1998, they would contribute 61,744 gpd in new, theoretical sewage flow during the period 1993-1997. In addition, it should be noted that any decision by property owners to develop other parcels depicted in Table 3-6 could accelerate the need for additional public sewer connections which is discussed in Section 4.1.2 below.

4.1.2 Planning Alternatives for Areas Requiring Connections to the Chester Creek (West Goshen STP) Sewage System - 1998-2002

Table 3.6 in the preceding section shows nine additional areas of the Township which could require connection to public sewers during the period 1998-2002. These nine areas are discussed below:

Price Property. The Price property, currently in agricultural use, contains 129.6 acres and is located south of Paoli Pike and east of Ellis Lane. There are no pending plans for development of this tract although development pressures are increasing along the Paoli Pike Corridor. The new 1992 Comprehensive Plan recommends that the developable portion of this tract be considered as a traditional neighborhood with possible cluster single-family residential development. Large portions of the property are affected by the Worsham and Wehadkee hydric soils with substantial flood plain areas in the center of the tract. The balance of the site is affected by the Glenville and Glenelg soils. It is expected that the property would be developed in accordance with R-2 zoning requirements with a cluster residential overlay applied which could produce 129 dwelling units or less.

It is projected during the period 1998-2002 that approximately 50 EDUs could be developed within the Price property. It is not likely that community onlot sewage systems would be proposed for reduced lot sizes under the cluster residential development concept although the Glenelg soils in the northwest corner of the property are appropriate for such sewage disposal methods. The balance of the Price property, which is capable of containing an additional 79 EDUs, would probably be developed after the year 2002. However, this potential for 27,650 gpd in additional sewage flow could be realized during the ten-year planning cycle if development pressures along Paoli Pike continue.

Park Avenue - Goshen Fire Company Property. The ultimate development of the Goshen Fire Company property was discussed in Section 4.1.1 above. No development plans are pending for this property. However, an additional 9,517 gpd in sewage flow is reserved for the period 1998-2002 because the R-3 Zoning District requires connection to public sewers.

Hicks Property - Balance of Land Including 34.8- and 36.7-Acre Properties. The aggregate 71.5 acres within the Hicks property is currently zoned for BP-Business Park Use and would generate the need for 21,807 gpd in new sewage flow when developed. It should be noted that the committed sewer connections for this property could be accelerated to the 1993-1997 five-year planning cycle if development pressures required earlier development. Although this property is seriously affected by flood plain and hydric soil/potential wetlands, the property does have reasonable access from Airport Road and from Paoli Pike

to each developable portion of the site. Public sewer connections would be mandated due to the current zoning requirements. Therefore, 21,807 gpd in potential new sewage flow is anticipated for connection to the West Goshen STP by the year 2002.

Saints Peter & Paul Church. It is very likely that the existing onlot sewage disposal system for Saints Peter & Paul Church can be continued indefinitely. However, in the 1991 township-wide survey of all facilities served by onlot systems, prior problems were reported for this facility. The entire property is zoned for R-2 Residential use. There are ample areas within the 30-acre site to allow a continuation of onlot disposal. Public sewers are available on Wilson Drive immediately opposite the Church's location on Boot Road. Another alternative would involve a grinder pump connection to the existing gravity sewer located in Windsor Drive in West Goshen Township to the west of Boot Road, but again opposite the Church property. It is most likely that the Church will continue to be served by its present onlot system subject to any future renovations required. However, the reservation for 1,150 gpd will be kept within the future public sewer service needs, and this site will be monitored periodically under the Township's onlot management program.

Green Acres Area and Strasburg Road - Route 352 Vicinity. In the vicinity of the Green Acres subdivision along Strasburg Road, there are three single-family detached dwellings which could be connected by gravity to the Chester Creek Sewage System. These units are currently served by onlot systems. In addition, along Strasburg Road in the vicinity of Route 352, there are 20 additional single-family detached units which may require connections to the Chester Creek (West Goshen STP) system during the next ten years. These units are currently served by existing onlot systems. Several nearby properties have been connected by low-pressure grinder pump connections to the public sewers. Although it is possible that many of these dwellings can continue with individual onlot systems, the possibility exists that many of the total 23 units will be connected to public sewers over the next ten-year period.

Charter Chase Subdivision. The 1991 survey of onlot system conditions showed a 14.5 percent malfunction rate for this area (refer to Table 2.7 in Section 2.3 of this report). The actual responses showed 11 prior or current malfunctions and one additional graywater

discharge. A separate walk-through field survey conducted in the Charter Chase area during April 1992 revealed a total of 21 existing or past malfunctioning systems and four additional graywater violations within 98 individual single-family detached dwellings located in this area of the Township. Many of the prior malfunctions reflected evidence of correction by the construction of new seepage beds and other remedial efforts.

Since the Charter Chase area, which contains 98 single-family detached dwellings, reflects a very high percentage (25 percent) of past and prior malfunctions, it must be monitored continuously over the next ten years. There are a number of alternatives available for the Charter Chase subdivision which are briefly discussed below:

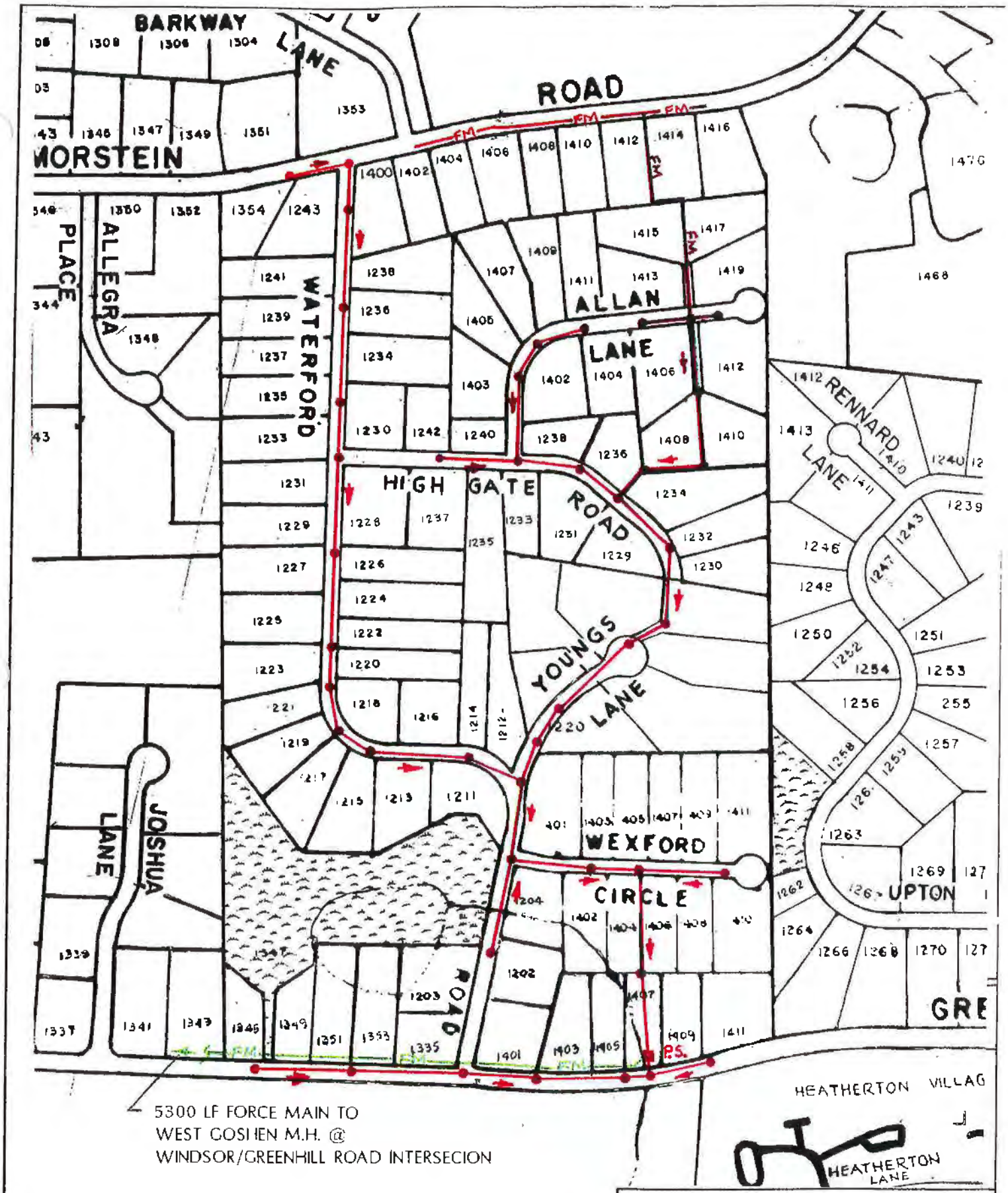
- Allow the onlot systems to remain while applying a rigorous inspection system of constant monitoring of pumping cycles and rehabilitation of failed systems.

- Analyze the possibility of utilizing sand mounds for the three to five dwelling units which have already received new seepage beds but which appear to be not working.

- Connect the entire subdivision to public sewers by the year 2002 using a combination of gravity sewers for 87 dwellings and grinder pump/low pressure installations for 11 additional dwellings. The wastewater would be collected at a pump station located on Greenhill Road where sewage would be pumped west along Greenhill Road across Boot Road to the first existing manhole in West Goshen Township at Windsor Drive.

It appears that the Charter Chase area can be stabilized and that the number of malfunctioning systems can be reduced with more frequent pumping, and repair of the existing systems and the removal, relocation or reconstruction of five to eight seepage beds currently located in the Worsham soil series.

The Charter Chase subdivision will continue to be shown in Table 3.6 with a future anticipated sewage flow of 32,550 gpd for the 98 dwelling units located in this area of the Township. Exhibit 4-1 depicts a feasible combination gravity/grinder pump/pumping station scenario for providing public sewers for the entire



CHARTER CHASE SEWER DESIGN

UPDATED ACT 537 WASTEWATER FACILITIES PLAN
DECEMBER 1992
EAST GOSHEN TOWNSHIP

SMC ENVIRONMENTAL SERVICES GROUP
Engineers, Managers, Scientists & Planners
VALLEY FORGE, PA

SCALE: 1" = 400'

EXHIBIT 4-1

Charter Chase area which would be pumped to the West Goshen STP. Please refer to the 1994 Addendum amending Section 2.3 of this report related to the Charter Chase subdivision.

Mill Valley Area. The Mill Valley area, including Barkway Lane and South Tulip Drive, is located adjacent to the West Whiteland Township municipal boundary north of Morstein Road. This area has existing capped sewers. This area contains 25 single-family detached units all served by onlot systems. During the 1991 survey of onlot systems, 16 of the 25 EDU owners responded to the survey, and only one prior malfunction was noted. There is no long history of malfunction or problems in this sector of the Township. However, a long-term reservation has been made for 8,750 gpd to assure that the Mill Valley subdivision could be served by public sewers and connected to the West Goshen STP if required. If this happened, this area would be connected near the year 2002 or possibly beyond the year 2002.

Another possible option or alternative for the Mill Valley area would be that West Whiteland Township would ultimately provide public sewers for the portion of Mill Valley located within their Township. If this alternative occurs, the 25 residential units located within East Goshen Township could be considered for connection to West Whiteland's sewer system.

Mill Stream Drive Area. The Mill Stream Drive area also contains 25 single-family detached residential units served by onlot systems. During the 1991 mail survey, there was one reported malfunctioning system and one graywater discharge or a total of two past or present violations. Mill Stream Drive should also be carefully monitored under the Township's onlot sewage facility monitoring program. The most appropriate way to provide public sewer service to the Mill Stream Drive area would be a gravity collection system to the Hersheys Mill Estates collection system where the sewage effluent would be pumped to West Goshen Township. A long-term potential reservation has been noted for this area should the need arise to provide public sewers.

In summary, the above nine described areas, if all connected to the West Goshen Sewage Treatment Plant, would add a theoretical daily flow of 108,074 gpd by the year 2002, or an expected 88,872 gpd in actual daily flow.

4.1.3 Areas Within the Ridley Creek Drainage Basin Requiring Possible Sewage Service During the Period 1993-1997

Sections 3.4 and 3.5 of this report indicate the urgent need to expand the existing Ridley Creek STP beyond its present permitted capacity of 400,000 gpd. Table 3.7 in the prior section of this report indicates the current projects, subdivisions, or facilities which are on-line to the Ridley Creek STP as of October 1992. These 13 facilities have a connected on-line use of 333,127 gpd in theoretical flow and a metered actual daily flow of 230,490 gpd. In addition, the Township has committed nine additional projects, areas, or facilities for connection to the Ridley Creek STP most of which will probably occur during the period 1993-1997. The nine additional connections would total 157,400 gpd in theoretical flow which, if all connected, would add approximately 109,000 gpd in actual flow during the five-year planning period. It should be noted within Table 3.7 of this report that the diversion of 84,420 gpd from the New Kent Apartments to the West Goshen STP would substantially reduce the above wastewater flows.

There are two particular areas of the Township which must be discussed in this Act 537 Plan Update although planning modules have been submitted and approved for public sewer connections for both areas. These are the Meadowbrook/Cornwallis area and the Highland/Taylor area which are discussed below.

Meadowbrook/Cornwallis Area. East Goshen Township previously reserved 26,600 gpd for the eventual connection of the Meadowbrook/Cornwallis area. This area of the Township first exhibited sewage malfunctions as recorded in the 1981 Act 537 Plan Update. The area was further noted as having increased sewage malfunctions in the 1985 Act 537 Plan Update. The results of the 1991 Township-wide survey of onlot system malfunctions, as reported in this report in Table 2.7, reflected eight malfunctioning systems, three other illegal discharges on the same property, and four graywater discharge violations or 31 percent violations reported by 48 homeowners.

In a 1991 field survey conducted within the Meadowbrook/Cornwallis area, members of the Township staff, the Chester County Health Department, and a representative of the homeowners' association completed a survey of 77 dwelling units within the area. The results are depicted in Table 2.8 of this report. Thirty-six percent of the 77 dwelling units reflect current or past sewage system malfunction and combined graywater discharge. In 1992, the Board of Supervisors approved the planning modules for the Meadowbrook/

Cornwallis area and directed the Municipal Authority to proceed with the design and construction of public sewers for the area.

A great deal of controversy has been generated by residents in the area who would prefer to have an all gravity sewer system instead of the proposed low pressure sewer system. Six years of engineering study resulted in a conclusion by the Board of Supervisors in 1992 that the area should be connected to the Ridley Creek STP as soon as possible. An outside engineering consultant was retained by the Civic Association to study the alternative cost formulas for the gravity system versus the low pressure sewer system. In addition, a third independent engineering consultant was selected by the Municipal Authority to study each of the proposals. It was clear that the low pressure system represented the most cost effective public sewer system for the area.

The low pressure sewer system for the Meadowbrook/ Cornwallis area is currently under design by the Authority Consulting Engineer. Therefore, detailed final plans are not available to depict the exact location of the low pressure sewer pipes which will serve the Meadowbrook/Cornwallis area. However, a reasonable facsimile of the low pressure sewer system design which is to be built for the Meadowbrook/ Cornwallis area is depicted in the recently approved planning module as Exhibit B24. Also a Plot Plan contained as the last page of the recently approved planning module depicts in greater detail all topographic details for both subdivisions and the intended pressure sewer system. Exhibit 4-2 is a reproduction of this Plot Plan.

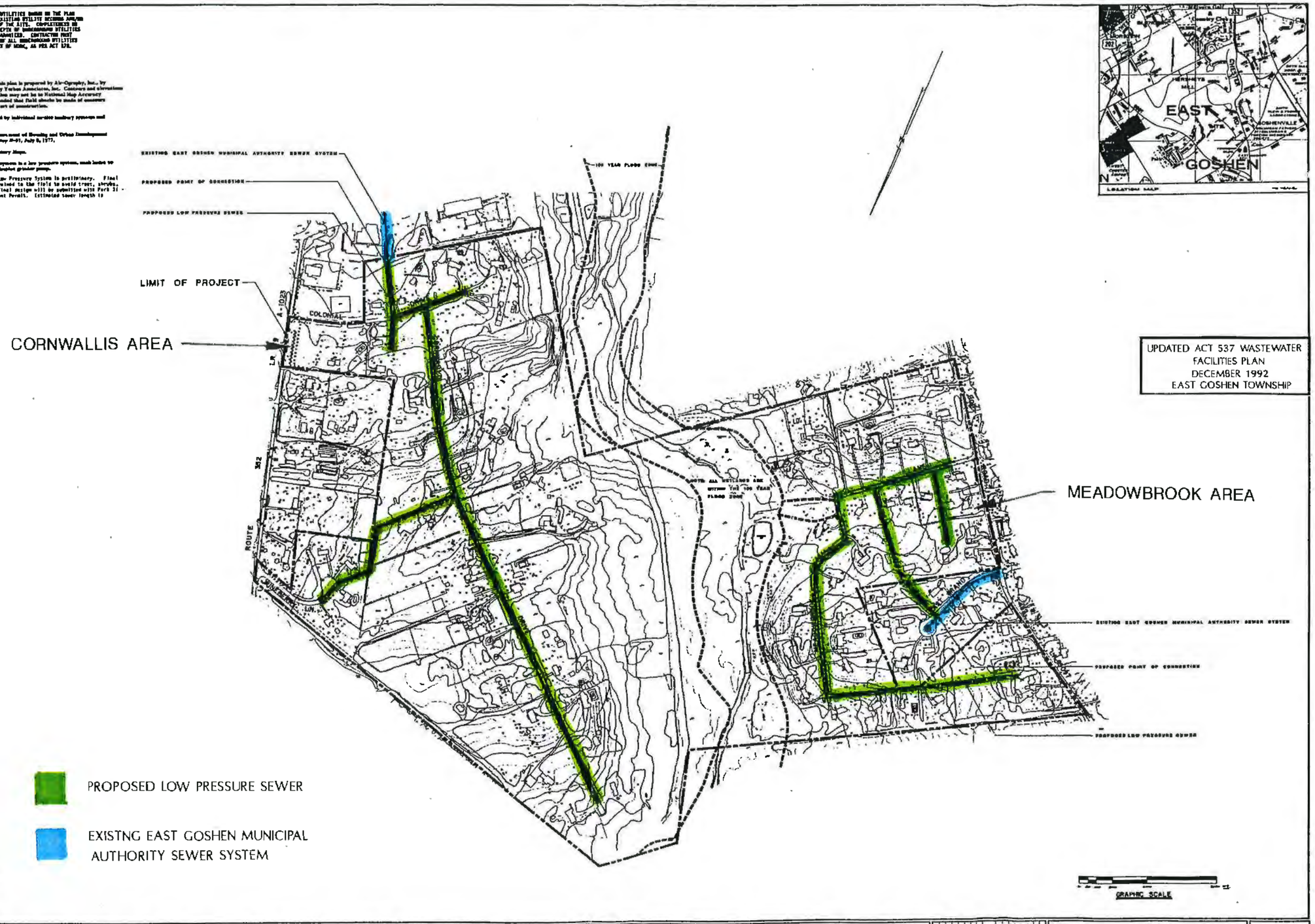
For the Meadowbrook portion of the proposed new pressure system, the pressure sewer will discharge into an existing gravity sewer line located at the end of East Grand Oak Lane. The proposed pressure system for the Cornwallis Drive/Colonial Drive/Wineberry Lane area will discharge to an existing gravity sewer located between Colonial Drive and Paoli Pike.

The planning modules approved by PaDER on July 2, 1992 include provisions for providing public sewer service via the pressure sewer method for 73 single-family homes or 25,550 gpd, which is three dwelling units less than the reservation for sewage flow for this area as depicted in Table 3.7.

ALL LOCATIONS OF EXISTING UTILITIES SHOWN ON THE PLAN HAVE BEEN DEVELOPED FROM EXISTING UTILITY RECORDS AND/OR ANDYS BROWN EXAMINATION OF THE SITE. COMPLETENESS OR ACCURACY OF LOCATION AND DEPTH OF UNDERGROUND UTILITIES OR STRUCTURES CANNOT BE GUARANTEED. CONTRACTOR MUST VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES AND FACILITIES BEFORE START OF WORK, AS PER ACT 121.

NOTES

1. Existing topography on this plan is prepared by Air-Cography, Inc., by aerial means and is not by Yerkes Associates, Inc. Contours and elevations in areas of dense vegetation may not be to National Map Accuracy standards. It is recommended that field checks be made of contours and elevations prior to start of construction.
2. Existing homes are served by individual on-site sanitary systems and individual wells.
3. Floodplain from U.S. Department of Housing and Urban Development Flood Hazard Boundary Map H-01, July 8, 1977.
4. Wetlands from U.S. Inventory Maps.
5. Proposed sanitary sewer system is a low pressure system, each home to connect to system by a simplex grinder pump.
6. Location of proposed Low Pressure System is preliminary. Final location will be determined in the field to avoid trees, shrubs, and roadway paving. Final design will be submitted with Part II - Water Quality Management Permit. Estimated sewer length is 9,750 feet.



UPDATED ACT 537 WASTEWATER FACILITIES PLAN
DECEMBER 1992
EAST GOSHEN TOWNSHIP

Drawn By DVI
Checked By DVI
Approved By DVI

YERKES ASSOCIATES, INC.
1444 PHOENIXVILLE PIKE • P.O. BOX 1989 • WEST CHESTER, PA 19380 • (215) 644-4254
CONSULTING ENGINEERS LANDSCAPE ARCHITECTS
SITE PLANNERS ARCHITECTS SURVEYORS

PROPOSED SANITARY SEWER
PLAN PREPARED FOR
EAST GOSHEN MUNICIPAL AUTHORITY
EAST GOSHEN TOWNSHIP, CHESTER COUNTY, PENNSYLVANIA

ISSUED APR 19 1992

PRELIMINARY
PLOT PLAN

DATE: 2-3-92
53-101
SCALE: 1" = 2000'

EXHIBIT 4

The recent appeal by the Meadowbrook/Cornwallis Civic Association to the Pennsylvania Environmental Quality Board is based upon the PaDER approval of the planning modules for a low pressure grinder pump system and the decision of the Municipal Authority to proceed with the installation of the pressure sewer system versus an all gravity system desired by the residents. Table 4.1 depicts a summary of estimated costs or expenses per unit as prepared by Yerkes Associates, Inc., as extracted from a memorandum to the East Goshen Municipal Authority from John B. Yerkes, Jr., dated January 31, 1992.

This table depicts the estimated cost per dwelling unit for the low pressure sewer system as compared with the Yerkes Associates' estimate for a gravity system serving both neighborhoods. Also incorporated in Table 4.1 is an estimate utilizing actual bid prices for a similar low pressure system now under construction in Wallace Township.

TABLE 4.1

MEADOWBROOK/CORNWALLIS AREA
SUMMARY OF EXPENSES PER UNIT

ITEMS	AUTHORITY	HOMEOWNER	TOTAL
Grinder Pump*	$ 1,820		
Pump Installation		$ 350	
House Lateral		872	
Electrical Installation		510	
Septic Tank Fill		220	
Authority Force Main	3,357		
Engineering	671		
Tapping Fee	(1,500)	1,500	
LOW PRESSURE SYSTEM ESTIMATE USING WALLACE TOWNSHIP PRICING	$ 4,348	$3,452	$ 7,800
YERKES ASSOCIATES, INC. ESTIMATE FOR GRAVITY SYSTEM (1990)	$14,700	$3,680	$18,380
YERKES ASSOCIATES, INC. ESTIMATE FOR LOW PRESSURE SYSTEM	$ 4,650	$3,780	$ 8,430

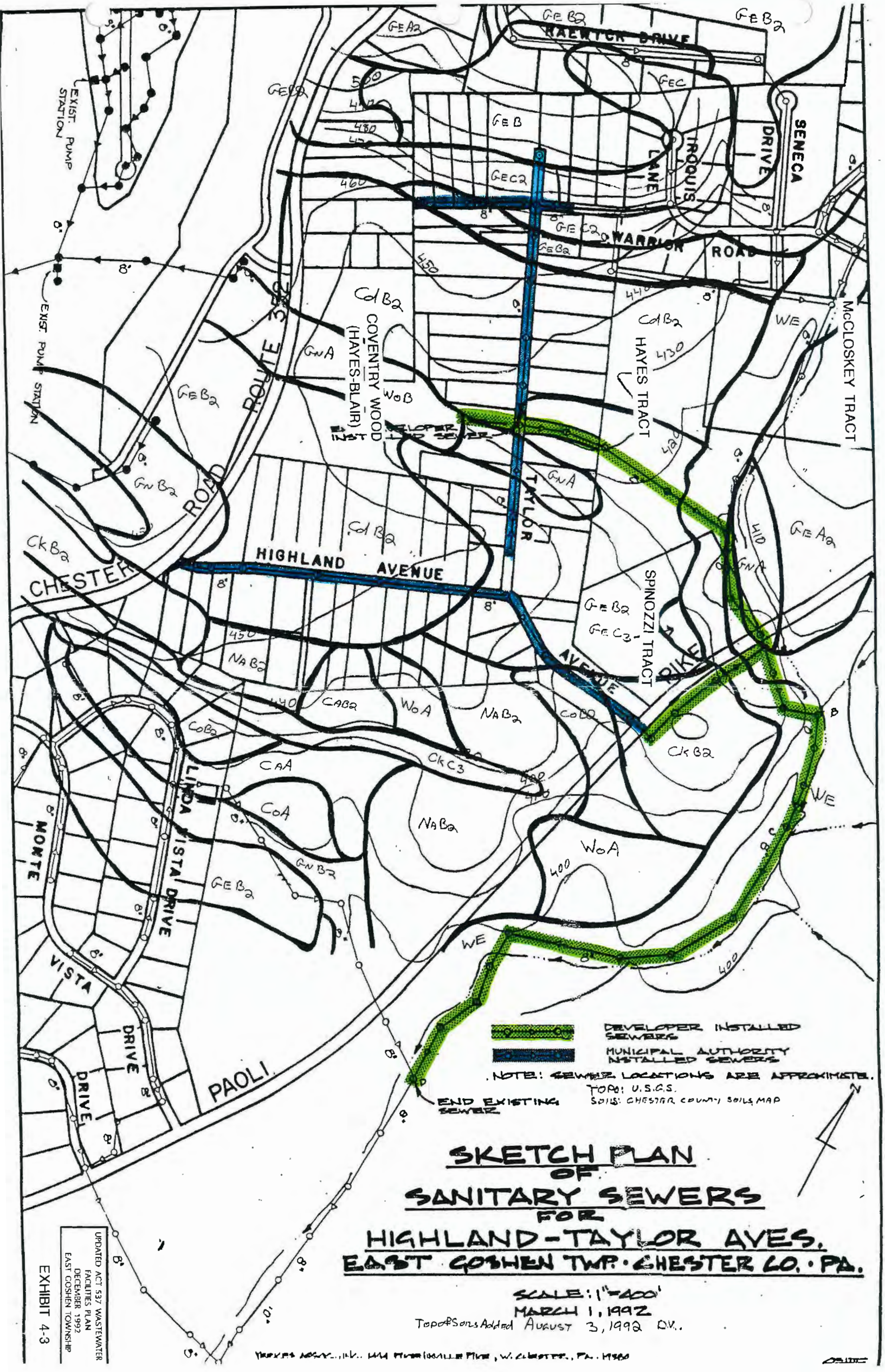
* Assumes that the $2,170 grinder pump costs break down to $350 for installation and $1,820 for pump unit cost.

In summary, SMC acting as Consultants for the Act 537 Plan Update, concurs with Yerkes Associates that the low pressure system is by far the most cost effective and that this system should be fully designed and constructed as planned.

Highland/Taylor Area. The Highland/Taylor area, containing 62 dwelling units has one of the highest reported rates of malfunctioning systems as determined in the 1991 survey of Township-wide onlot systems. Table 2.7 of this report depicts a response of 49 of 62 homeowners or 79 percent. Nine prior or present malfunctioning systems and four additional graywater discharge problems were reported representing more than 26 percent of the residential owners responding to the survey. This area has been under study by the Township and the Municipal Authority for almost ten years. The revised planning modules for providing gravity sewer service to 64 existing single-family dwellings was resubmitted to PaDER on August 4, 1992 and was approved by PaDER in January 1993. Attached on the following page as Exhibit 4-3 is a sketch plan for the proposed gravity sanitary sewer system for the Highland/Taylor area. The system, which is now under design by the Authority consulting engineer, will have minor modifications at the intersection of Warrior Road and Taylor Avenue, but otherwise will be constructed as depicted and connected to the SmithKline Beecham sewer extension now being constructed by Realen Homes, the developer of the Hayes tract.

Highland Avenue will be served by a basic gravity sewer system extending eastwardly to Taylor Avenue, thence across Paoli Pike and again eastwardly within the SmithKline Beecham property to the trunkline. Portions of Warrior Road and all of Taylor Avenue above Highland Avenue will be serviced by a gravity sewer system collecting at the streambed and flowing eastwardly to the Hayes property to Paoli Pike and thence into the SmithKline Beecham property.

The construction of public sewers in the Highland/ Taylor area will represent a significant improvement in public health and safety conditions in this vicinity of the Township. During 1991, one homeowner, whose onlot system could not be certified, working with the Township's cooperation, constructed a private sewer lateral to the existing gravity sewer in Linda Vista Drive in order to sell his dwelling. Other severe cases of continued onlot malfunctions will be cured with the construction of this new sewer system which is estimated to go on-line to the Ridley Creek Treatment plant during the period 1993-1997. Of all areas within East Goshen Township requiring immediate public sewers, the Highland/Taylor area is by far the most urgent.


HAEWICK DRIVE
SENECA DRIVE
IROQUIS LANE
WARRIOR ROAD
McCLOSKEY TRACT
HAYES TRACT
SPINOZZI TRACT
COVENTRY WOOD (HAYES-BLAIR)
DEVELOPER INSTALLED SEWER
TAYLOR AVENUE
HIGHLAND AVENUE
CHESTER ROAD
ROUTE 352
EXIST. PUMP STATION
EXIST. PUMP STATION
LINDA VISTA DRIVE
MONTE VISTA DRIVE
PAOLI DRIVE
END EXISTING SEWER
DEVELOPER INSTALLED SEWERS
MUNICIPAL AUTHORITY INSTALLED SEWERS
NOTE: SEWER LOCATIONS ARE APPROXIMATE.
TOPO: U.S.G.S.
SOILS: CHESTER COUNTY SOILS MAP
SKETCH PLAN OF SANITARY SEWERS FOR HIGHLAND-TAYLOR AVES.
EAST GOSHEN TWP. · CHESTER CO. · PA.
SCALE: 1"=400'
MARCH 1, 1992
Topo & Soils Added AUGUST 3, 1992 DV.
UPDATED ACT 537 WASTEWATER FACILITIES PLAN
DECEMBER 1992
EAST GOSHEN TOWNSHIP
EXHIBIT 4-3

In addition to the nine properties or facilities depicted in Table 3.7 as being committed and in progress, there are three additional properties or facilities which may require connection to public sewers during the period 1993-1997. These three properties or facilities are discussed below:

Spinozzi and McCloskey Properties. Each of these properties has a future reservation for five EDUs each or a total of ten EDUs representing 3,500 gpd in future sewage flow. The connection of these properties would be dependent primarily upon need (which is not evident at this time) and the completed construction and availability of adjacent sewer connections between the Hayes/Blair property and within the Highland/Taylor area. A sewer easement is in place from the McCloskey property to the Hayes property. The Municipal Authority will construct a sewer line from the Hayes property to Highland Avenue and will be reimbursed when the Hayes/Blair property is developed. Five EDUs have been reserved for the 1993-1997 planning period and five additional EDUs have been reserved for the balance of the ten-year sewage planning cycle extending to the year 2002.

Bryn Mawr Rehabilitation Center. The Bryn Mawr Rehabilitation Hospital and Center has been on record for a number of years requesting the ability to connect to the Ridley Creek Treatment plant because of current problems being experienced at the Rehabilitation Center site. Although this facility is located in Willistown Township, this need for 40,000 gpd is considered to be extremely valid and necessary. In order to serve the Bryn Mawr Rehabilitation facility, a gravity sewer would be required along Paoli Pike connecting to the SmithKline Beecham sewer system extension now under construction. East Goshen Township can consider this request for external municipal sewage service only when approval has been received for the needed expansion of the Ridley Creek STP beyond its present limit of 400,000 gpd.

Christ Memorial Lutheran Church. The Christ Memorial Lutheran Church located on the east side of Line Road and north of Paoli Pike has been on record for several years requesting a connection to the Ridley Creek STP. This facility is also located in Willistown Township. Alternative sewage connections for this Church facility could occur as a result of a gravity sewer along Line Road, to Paoli Pike in connection with a future connection for the Bryn Mawr Rehabilitation Center, or another alternative is a connection through the Realen property currently being developed. Since this

facility is also located in Willistown Township and is external to the current service area of the Ridley Creek STP, this provision of requested sewer service can only be considered upon approval of expansion of the Ridley Creek STP, or other alternatives now under study by East Goshen Township.

The addition of the above properties, when and if needed and approved, would add a total of 42,750 gpd in theoretical sewage flow or approximately 42,210 gpd in estimated actual sewage flow.

4.1.4 Areas Within the Ridley Creek Drainage Basin Requiring Possible Sewage Service During the Period 1998-2002.

Table 3.7, contained in the prior section of this report, outlines six additional properties which could require connection to public sewers during the period 1998-2002. All of the connections would be totally dependent upon the expanded capacity of the Ridley Creek STP to 700,000 gpd. These facilities, areas, or developments are discussed below:

SmithKline Beecham. The SmithKline Beecham facility, known currently as the Applebrook Research facility, is the second largest land holding within East Goshen Township. SmithKline Beecham currently holds (and has paid for) 40,000 gpd in reserved capacity at the Ridley Creek STP. In addition, Beecham holds an option for purchase of a 12,000 gpd future connection when required.

SmithKline Beecham prepared its own Sewage Facilities Planning and Environmental Site Analysis for the entirety of its property under date of August 8, 1991. This study was prepared by Cahill Associates. Table 1 of the above cited study depicts a total project wastewater need for the SmithKline Beecham property as being 95,080 gpd at the time of ultimate development. Since 40,000 gpd has been reserved and is either on-line or committed and in progress, an additional 55,000 gpd is depicted as being needed during the period 1998-2002. A summary statement is contained in this report which indicates "If additional capacity in excess of the currently allocated 40,000 gpd becomes available in that (the municipal) system during the interim period, all wastewaters will be discharged to the public system." Although the SmithKline Beecham report indicates that total sewage needs would not occur until the year 2005, it is more expedient to assume that development will occur on this site during the next ten years and may be predicated in part upon the approval of an expanded Ridley Creek STP.

SmithKline Beecham does have an alternative to handle any excess wastewater flow beyond its present 52,000 gpd reservation and option which would involve land application of effluent within the 312-acre parcel. However, it is clearly stated that the preferred option is to discharge all wastewaters to the Ridley Creek STP. SmithKline Beecham and East Goshen Township recently settled litigation involving zoning matters resulting in SmithKline Beecham's withdrawal of their subdivision plan and sewer capacity reservation request. Based upon current information, it does not appear that SmithKline Beecham will need additional wastewater capacity beyond the 40,000 gpd currently reserved (and paid) at the Ridley Creek STP. The 12,000 gpd option for additional future wastewater service has expired.

Spinozzi and McCloskey. The balance of the Spinozzi and McCloskey five EDUs could require connection to the Ridley Creek STP during the five-year period ending in the year 2002. The need and timing of such connection was discussed in the prior section of this report.

Woods Property. This R2 zoned property is located south of Forrest Lane and west of Line Road. The site is currently undeveloped. No development plans have been submitted to the Township for this property which contains 85.9 acres. In order to provide public sewer service for this site when developed, a gravity sewer would have to be constructed south along Line Road possibly in conjunction with a future gravity sewer line serving the Willow Pond subdivision which currently utilizes a community onlot system. No studies have been worked out as to whether such a gravity system would follow the streambed or be constructed within the right-of-way of Line Road. This alternative to provide public sewers for this undeveloped property would have to be worked out by the Township in conjunction with the adjacent Sherman property (37.8 acres) which abuts the Willow Pond subdivision. A future sewer service need of 30,100 gpd is projected, assuming development will occur prior to the year 2002. A small portion of the Woods property is affected by hydric soils and flood plain, but the predominant part of the property contains the Glenelg soil series.

As an alternative, portions of the property might be developed with conventional onlot sewage disposal systems with capped sewers for future connection to the Ridley Creek STP. Community-type onlot wastewater disposal facilities are not recommended for this property in view of the failure of a similar system

immediately to the north of this site associated with the Willow Pond development.

Willow Pond Subdivision. This facility has 28 existing single-family detached dwellings (15 in East Goshen and 13 in Willistown) and has been discussed previously in Section 2.4 of this report. The 28 EDUs are currently served by a community onlot system. The initial sewage beds malfunctioned and were replaced during 1992 by the Homeowners Association. It is apparent that this community-type in-ground system may have to be ultimately replaced and connected to the Ridley Creek STP in conjunction with future potential development of the Woods property and possibly the adjacent Sherman property. A future projected need of 9,800 gpd is indicated for the ten-year planning period ending in the year 2002.

Sherman Property. This 37.8-acre tract zoned for R2 Residential Use has a potential, when developed, of producing 12,950 gpd. The Sherman property is affected by hydric soils and flood plain to a limited extent but has the similar soils associated with the Willow Pond development located to the east. The Sherman property is located just north of Forrest Lane and to the west of Willow Pond. If this property is developed prior to the availability of public sewer extensions to the area, it is recommended that capped sewers be installed because of anticipated poor soil conditions in this vicinity. A future public sewer service need for 12,950 gpd is depicted as being necessary prior to the year 2002.

William Henry Apartments. The William Henry apartment complex is currently located in East Whiteland Township. The facility currently has a wastewater treatment facility handling 59,000 gpd which discharges directly to Ridley Creek. In addition, adjacent zoned property would allow additional apartments contributing an additional 11,000 gpd. Since this facility is located outside of East Goshen Township, the requested sewage service needs would be considered only after the approval of the expansion of the Ridley Creek STP. In the alternative, the future connection for the William Henry apartments might be considered under the "West Goshen Alternative" now under study by East Goshen Township.

The above six facilities when and if approved for connection to the Ridley Creek STP would add approximately 168,600 gpd in theoretical sewage flow. One important addition has occurred just as this report was being published.

Previously, Immaculata College contacted East Goshen Township with a request interpreted as being a need to treat approximately 5,000 gpd in sewage flow from one facility at the college. This was based upon a returned onlot sewage disposal survey form related to the Villa Maria House which reflected average daily sewage generation of 5,000 gpd. Initial information suggested that a holding tank was in use but an NPDES Sewage Permit No. 0050423 was attached. The permit is for discharge into an unnamed tributary to Ridley Creek.

On November 6, 1992, the Township received a written request from legal counsel representing Immaculata College/ Camilla Hall/Villa Maria House of Studies requesting consideration of connecting 137,700 gpd in wastewater flow from the above facilities to the Ridley Creek STP. This additional external need from East Whiteland Township is being discussed by the Municipal Authority and East Goshen Township for possible inclusion in the Ridley Creek STP, as expanded. If expansion is not possible, the "West Goshen Alternative" must be considered. Please note that only 5,000 gpd is shown as a future need beyond the year 2002 for Immaculata College, and this may be subject to change if further studies warrant.

4.2 Areas to Remain with Individual Onlot Systems - 1993 to 2002

At the time of the 1991 Township-wide survey of onlot systems, 699 such systems were known to be in existence within the Township boundaries. The number of dwelling units which would be removed from the individual onlot disposal category would include the following over the next ten-year period:

Ridley Creek Drainage Area

- Meadowbrook/Cornwallis Area - 73 dwellings
- Highland/Taylor Area - 63 dwellings
- Spinozzi-McCloskey - 10 dwellings

Subtotal - 146

Chester Creek

- Charter Chase - 98 dwellings

Total 244 Potential Conversions

Based upon 1993 field survey results, it does not appear necessary at this time to provide public sewers for the Charter Chase subdivision noted above.

It was previously noted that the Charter Chase subdivision may not require connection to public sewers if the Township-wide

onlot management program is successful. As a minimum, the 136 EDUs located within the Meadowbrook/Cornwallis area and the Highland/Taylor area will eventually be removed when served by public sewers. In addition, the Spinozzi and McCloskey property could also be connected in the next ten years. If all of the above dwelling units are connected, the remaining individual onlot sewage systems would total 455 dwellings, plus any additional dwellings which might be approved in the future for individual onlot systems.

4.3 Individual Onlot System Onlot Management

East Goshen Township has learned through experience and recent walk-throughs of major properties during the last two years that some homeowners within the Township totally neglect their onlot sewage disposal systems. The Township is in agreement that an onlot disposal system management program is vital and necessary to assure that widespread future malfunctions are diminished and/or eliminated where possible.

The need to monitor individual residential pumping cycles of septic tanks and cesspools has become very evident during the period 1989-1992. Many homeowners reported in the November 1991 Township-wide study that they had "never pumped" their septic system or cesspool. It was obvious from the returned survey forms that many people were not even aware that they were serviced by onlot systems.

This can be quickly corrected with a rigorous onlot management program supported by a proposed new ordinance to be adopted by the Township during 1994. The consultant has provided a draft copy of a model ordinance now in use in other municipalities and the Municipal Authority has obtained additional draft copies of similar ordinances which appear to be more suited to use within East Goshen Township.

It is also the consultant's recommendation that the Township adopt an ordinance requiring mandatory capped sewers for new construction in areas where poor soil conditions exist and where land owners/developers are currently entitled to the use of individual onlot sewage disposal facilities as a matter of law and PaDER regulation. It is strongly recommended that the capped sewer ordinance carry a ten-year time frame for anticipated connections to proposed public sewer extensions.

The consultant has also recommended that an increased public awareness program be instituted by the Township and the Municipal Authority providing the remaining owners of individual onlot systems with specific written and graphic information depicting the need to pump all systems and particularly failing systems, to limit the use of garbage grinders within the households where failures are apparent, and to secure professional design advice

regarding the rehabilitation of questionable onlot systems. All new incoming residents of the Township acquiring dwelling units served by onlot sewage disposal facilities must be placed on notice that they are not connected to a public sewer system and that their onlot system will require frequent attention and monitoring.

4.3.1 Areas Covered by East Goshen Onlot Management Program

The East Goshen Individual Onlot Management Program will cover the entire Township. However, the Township has previously identified the residential address for every known individual onlot system located within the Township. These addresses were used during the Township-wide mailing of the 1991 Sewage System Mail Survey. All such addresses for residential and other onlot systems will be monitored continuously.

4.3.2 Periodic Inspections and Maintenance Required

As a minimum the East Goshen Onlot Sewage Management Program will require pumping of all septic systems and all cesspools not less than once during each three-year period. The program will contain provisions for annual pumping for selected residential units identified as having prior malfunctions and periodic high-water levels in tanks or systems previously noted during field inspections or as reported in the 1991 Township-wide survey results. Septage haulers will be required to register with the Township Sewage Enforcement Office annually. Each authorized septage contractor will be required to report specific results of the condition of the system at the time of required pumping. The Township will require periodic inspections for properties having systems which report continued problems, malfunctions and/or violations.

4.3.3 Legal Authority for Enforcement

East Goshen Township will adopt, in 1994, a specific Onlot Sewage Management Ordinance which will establish the legal authority for the Township to execute this program. The Township will create the authority for issuing "warnings and potential violation notices." The legal authority for enforcement of violations will be delegated to the Chester County Health Department, the current agency having jurisdiction for violation enforcement.

4.3.4 Standards for Operation, Maintenance, Repair and Replacement

East Goshen Township will require, under the Onlot Sewage Management Program, that all existing septic systems, cesspools, and similar methods of sewage disposal be maintained without malfunctions or violations on a continuous basis.

Existing systems, which show continued potential for pollution and those systems which are classified as malfunctioning under current state regulations, will be required to be replaced.

4.3.5 Fee Schedules and Revenues

The Chester County Health Department has already established a fee schedule for permits related to systems requiring repair, renovation, or replacement. The Board of Supervisors of East Goshen Township will establish a uniform fee schedule to offset anticipated costs related to monitoring systems, maintenance of systems, and administrative fees for notices of violation referred to the Chester County Health Department. A separate fee schedule will be considered by the Township related to building permits and certificates of occupancy for all new EDUs having individual onlot systems. This fee will be related to notices attached to each certificate of occupancy requiring specific maintenance standards for the new onlot system.

4.3.6 Bonding or Financial Assurances

East Goshen Township has decided to adopt a new Individual Onlot Sewage Management Program which will also cover community onlot disposal systems (COLDS). This Ordinance may be adopted by June 1994. A copy of this Ordinance is incorporated in the Plan Summary.

4.3.7 Individual Onlot Sewage Management Program Ordinance

A copy of the draft Ordinance being considered for adoption by East Goshen Township is enclosed in Section 8 of the Plan Summary at the front of this document.

4.3.8 Other Factors Considered

East Goshen Township has already adopted appropriate building code requirements related to water conservation devices for all new construction. In addition, the Township will require appropriate storm water management diversions away from all new inground systems and appropriate remedies for similar storm water problems related to existing chronic malfunctioning systems. Where aerobic tanks are in use, appropriate maintenance and safety requirements will be regulated including alarms, electrical, mechanical, and chemical injection devices required. The Township will not attempt to regulate the location of septage disposal since most existing septage haulers have existing arrangements at local STPs.

4.4 Private Community Systems

As noted in Section 2.4 of this report, there are two remaining private community-type systems located within the Township. The Lockwood Chase facility is now under the ownership and operational control of the Municipal Authority.

The Willow Pond community onlot treatment system is fully discussed in Section 2.4. However, it is apparent that during the ten-year planning cycle 1993-2002, it may be necessary to connect this system to the Ridley Creek STP and place it under the operational control of the Municipal Authority. In the Willow Pond scenario, any decision to develop nearby undeveloped parcels may stimulate or cause an earlier connection to the public sewer system.

It is the opinion of the consultant and the administrative staff of East Goshen Township that the Hersheys Mill Village spray irrigation system is well designed, operating efficiently, is well funded with a more than adequate capital reserve budget, and need not be considered for take over by the municipality during the ten-year planning period 1993-2002. However, the Township will be prepared, by whatever form of legal agreement required, to consider a municipal takeover of this system if the Hersheys Mill Homeowners Association depicts any signs of change in attitude, which is currently to retain ownership and operational control of this sewage system. The Township will keep an open mind on the subject of a potential municipal takeover of the Hersheys Mill Village community system and will review this subject again in 1997 or sooner if warranted.

4.5 Sewage Facilities Management

East Goshen Township has one of the most efficient sewage facility management programs existing within Chester County. The Municipal Authority is a non-operating authority and all facilities are operated by East Goshen Township. The Board of Supervisors has always been responsive to major sewage facility planning needs as evidenced by its frequent investments in Act 537 Plan Updates and future sewage facilities planning.

The Municipal Authority engineer currently works directly for both the Municipal Authority and the Township Board of Supervisors. All capital needs are promptly addressed and requests for new sewage treatment service is considered fairly by the Township within its means to provide such service. The Township staff spends a considerable amount of time and effort in administering the sewage facilities program including monthly monitoring of public sewage flows and the status of cooperative agreements with adjacent townships. It is expected that this

method of management will continue through the sewage facilities planning period of 1993-2002.

It is recognized that the undertaking of the onlot individual sewage facilities monitoring program on a Township-wide basis may add the need for additional staff time in the monitoring of pumping records and the notification to residents for timing and follow-up based on sewage pumping record recommendations. There are no recommended major institutional changes to the sewage management program now in place within East Goshen Township.

4.6 Spray Irrigation Alternative for Ridley Creek STP

The Ridley Creek STP must be expanded to 0.7 MGD. An alternative involving spray irrigation of the additional 0.3 MGD shows that 65 acres of land would be required for spray fields and lagoons. An assumed cost of $55,000 per acre plus $400,000 for pumps, piping and lagoons would cost $3,975.000.

When added to the cost of the STP expansion ($1,200,000), the total cost for a spray irrigation option would be $5,175,000, or $17.25 per gallon of new treatment capacity. This could never be cost effective. In addition, there is no available land for consideration of the spray alternative. Please refer to the Addendum to Section 4.6 following this page.

ADDENDUM TO SECTION 4.6
SPRAY IRRIGATION ALTERNATIVE FOR
RIDLEY CREEK STP

The December 1992 Final Draft for the Act 537 Plan Update was distributed to each adjacent municipality and to the County reviewing agencies during February 1993. The Chester County Planning Commission review as well as the Chester County Health Department review and the Willistown Township letter of comments all encouraged the possible use of a spray irrigation alternative for the estimated 300,000 gallons per day (gpd) in additional wastewater effluent projected for the Ridley Creek STP. The Township has investigated the possibility of the use of spray irrigation techniques with the following summary results.

Table 6.1 as contained on page 6-2 of Section 6.0 of this report clearly establishes an ultimate need for 670,299 gpd for potential wastewater treatment needs at the Ridley Creek plant. When the additional 132,700 gpd requested by Immaculata College is added, the actual anticipated wastewater flow under current plan update conditions would be approximately 740,000 gpd. For future design and discussion purposes only, a figure of 300,000 gpd has been utilized in this Plan Update as the need for expansion of treatment availability at the Ridley Creek STP.

Since a good part of the infrastructure and collection system is already in place for treatment at the Ridley Creek STP, it is logical to assume continued use of the expanded collection system and treatment at the STP. Other sections of this report discuss the viability of use of the A/O system as a means of expanding the current treatment capability from 400,000 gpd to 700,000 gpd. This option would continue to be utilized under a spray irrigation alternative at an estimated cost of $1,200,000 for the STP upgrading.

In lieu of stream discharge into Ridley Creek for the additional 300,000 gpd, a potential alternative would be to acquire nearby property, if available, for spray irrigation purposes.

Only two properties exist within the Ridley Creek watershed which contain sufficient acreage to handle the facilities and spray fields necessary for the discharge of 0.3 MGD. These include the SmithKline Beecham property located north of Boot Road and the additional possibility of use of all or part of the Grace Estate property located immediately adjacent to and south of the Ridley Creek STP.

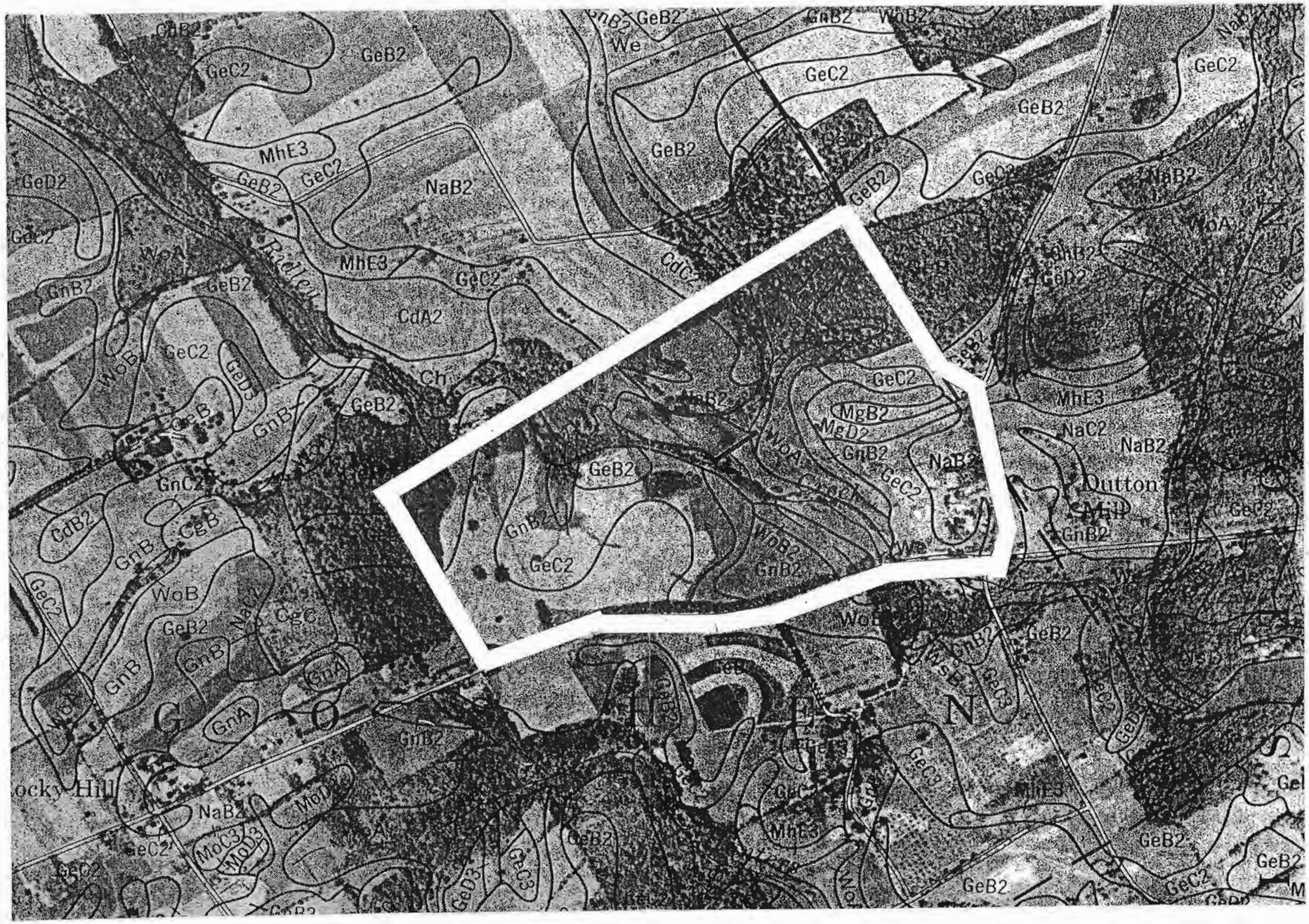
SmithKline Beecham Site

SmithKline Beecham (herein Beecham) currently owns 312 acres bounded by Paoli Pike, Boot Road, and Township Line Road. In August 1991, Beecham presented to the Township a Sewage Facilities Planning and Environmental Site Analysis for Land Application of Wastewater Effluent based on a proposed development of the entire site. The Land Development Plan that accompanied the Sewage Facilities Study was withdrawn. However, Sewage Facilities Study remains a valuable tool in the evaluation of the tract of land. Figure 13 contained in this study shows the proposed land application areas and winter storage lagoons for a spray irrigation alternative. This carefully prepared study documents by way of percolation tests and soil profiles the areas within the site which are suitable for spray irrigation. Such areas are depicted in Figure A-1 of the Beecham report. According to the report, Beecham could handle its ultimate wastewater generated on the site by using the effluent spray areas and the winter storage ponds depicted on Figure 13.

The Township recently reached a settlement with Beecham for the rezoning and future use of this tract for combined residential or office park purposes. The centroid of the Beecham effluent spray areas is located 1.1 miles north of the Ridley Creek STP. A pumping station located at the Ridley Creek STP conveying treated effluent 1.1 miles north to the Beecham property could never be cost-effective, particularly in view of the assumed necessary condemnation of approximately 75 acres of suitable effluent spray area and storage pond area. Therefore, the use of the Beecham property for future spray irrigation purposes is dismissed as a possible alternative because of the need to pump treated effluent more than 1.1 miles and the high expected cost of condemnation per acre (assumed to be in excess of $60,000 per acre) in addition to the burden of exceptionally high operating costs for future years.

Grace Estate

The Grace Estate property, comprising 182 acres, is located immediately south of the Ridley Creek STP and is bounded on the south by East Strasburg Road and on the east by Township Line Road. The site is currently undeveloped. It is possible that the entirety of this adjacent property (or major portions thereof) could be suitable for spray effluent areas. The attached exhibit depicting the soils for the entirety of the Grace Estate property is shown on the following page as Exhibit 4-4. The soils paralleling Ridley Creek are predominately Worsham series and Wehadkee series with Glenville silt loam and Glenelg silt loam occupying substantial portions of the property to the west of Ridley Creek. It is estimated that it would be necessary to acquire the entire westerly half of this property (west of Ridley Creek) and perhaps suitable portions of



GRACE ESTATE SOILS

EXHIBIT 4-4

the property east of Ridley Creek in order to meet the estimated physical area needs of 75 acres required for application of spray effluent for an additional 300,000 gpd.

The Township believes that the acquisition of any portion of this property would most likely involve condemnation procedures. The best available estimate is that this property would carry an approximate raw land value of $55,000 per acre since acquisition of these major portions of the site would destroy the utility of the balance of the site. Thus, the estimated cost for acquiring approximately 75 acres of the Grace Estate parcel would involve a cost of approximately $4,125,000 and possible additional consequential damages to the balance of the site.

Spray Irrigation Alternative Spatial Needs

The following alternative design assumptions have been utilized in determining the physical or spatial needs for spray field effluent involving 300,000 gpd. Assuming that soil testing would allow the discharge of the above amounts, the following data is relevant.

Land Area Required

- One inch of effluent/week equals 77.3 acres plus buffer and storage pond
- One and one-half inches of effluent/week equals 51.5 acres plus buffer and storage pond
- Three quarters of an inch of effluent/week equals 103.1 acres plus buffer and storage pond

Several design alternatives for an assumed required need for a 60-day winter storage pond are indicated below.

- Eight-foot deep pond equals 9 acres including slope limits
- Six-foot deep pond equals 12.2 acres including slope limits
- Ten-foot deep pond equals 7 acres including slope limits

An average 8-foot depth of pond was assumed for this design alternative. A 1-1/2-inch per week effluent application rate was selected (assuming this is possible) which would require 51.5 acres of spray field area plus a required 100-foot nominal buffer comprising 14.6 acres or a total of 66 acres for spray effluent use. When combined with the 9 acres required for a 60-day storage pond at a average depth of 8 feet, the resulting

required land area is 75 acres. Assuming that 75 acres represents the physical land area requirement at an average price of $55,000 per acre, this would result in an estimated $4,125,00 in costs. Under the Chester County Spray Irrigation Grant Program, utilizing Chester County Open-Space funding, the Township might be entitled to a maximum grant of $600,000 since multiple municipality involvement is anticipated.

Thus, the net cost of $3,525,000 plus an additional $400,000 of estimated cost for the spray field piping and pumping system, plus the $1,200,000 in estimated cost for expansion of the treatment plant would bring the total cost for this alternative to $5,125,000. When equated to the 300,000 gpd of anticipated new wastewater effluent, this results in an estimated cost in excess of $17 per gallon of wastewater treated as compared with the estimated $4.50 per gallon for expanding the STP and allowing stream discharge to Ridley Creek.

It is the Township's position that this spray irrigation alternative, under the above assumed conditions, is not a viable alternative from the initial cost factors and in view of the possibility that the land cost listed above could be higher (based on consequential damages).

5.0 EVALUATION OF EACH ALTERNATIVE PROPOSED

5.1 Evaluation of Consistency of Alternatives Proposed

The purpose for an Act 537 Plan Update is to provide a 10-year blueprint for upgrading existing areas of the Township which are experiencing or exhibiting both major and minor problems with respect to wastewater treatment. The ultimate goal is to make provisions for the safest possible wastewater treatment methods without ignoring the environmental standards already in effect at the local, county, state, and federal levels.

Another purpose of the Act 537 Plan Update is to evaluate the potential future development needs of the Township and to provide the best possible alternative for wastewater treatment facilities within such projected growth areas notwithstanding the existing environmental standards which are applicable including the water quality standards for Chester Creek and Ridley Creek extending to the Delaware River. It should be noted that the water quality standards for Chester Creek are controlled primarily by West Goshen Township for certain sewage treatment needs within East Goshen Township. East Goshen Township proposes no additional stream discharge requirement within the Chester Creek area.

There are numerous mandatory requirements for evaluation of each alternative proposed within this plan, only a few of which are impacted by the proposed new or extended public sewers recommended in this Act 537 Plan Update.

A. Plans Developed and Approved Under Sections 4 and 5 of the Clean Streams Law (35 P.S. Section 691.4 and 691.5) and under Section 208 of the Clean Water Act (33 U.S.C.A Section 1288).

The primary water quality plan prepared under the provisions of the above statutes is the COWAMP 208 Water Quality Management Plan which was published in April 1978. A synopsis of the requirements of the COWAMP/208 Water Quality Management Plan is contained on pages 1-1 to 1-3 of this updated Act 537 Plan. The COWAMP/208 plan does not identify any wastewater treatment facility located within East Goshen Township. East Goshen Township is a part of the Delaware River Subbasin and occupies the uppermost headwaters of both Chester Creek and Ridley Creek.

Page J-40 of the COWAMP/208 plan describes in paragraph 2 the 1977 baseline conditions for water quality within Chester Creek and emphasizes that the nitrate-nitrogen levels are consistently predicted

above 10 mg/l which would be in excess of PaDER's proposed criteria throughout the 22-mile length of the stream. There are no STP discharge facilities existing or proposed into Chester Creek located within East Goshen Township. The expanded West Goshen STP must meet PaDER current water quality standards established for Chester Creek, including any major additional flow from East Goshen now being contemplated as the "West Goshen Alternative."

Page J-40 of the COWAMP/208 study describes the water quality in Ridley Creek as being "generally good to excellent above Media Borough." The dissolved oxygen violations noted and predicted for the year 2000 all occurred below the Media Borough treatment plant.

Since all of the proposed new sewer extensions and areas to be served within the Chester Creek (West Goshen) STP are within the 1.0 MGD allowed by present agreement with West Goshen Township, the water quality standards maintained within Chester Creek will be reflected in the stream discharge requirements for Chester Creek established by PaDER at the STP discharge point.

Within the Ridley Creek drainage basin, the Ridley Creek STP is operated under a current NPDES permit with discharge limitations depicted in Figure 2.2 of this updated Act 537 Plan. The plant is currently operated well below the discharge limitation. Through the end of the two 5-year planning cycles (1993-1997 and 1998-2002), the Ridley Creek treatment plant should be expanded to a range of 0.6 to 0.7 MGD by the year 2002. Ridley Creek was classified as a high quality stream after the original permit was issued for the STP in 1984. Therefore, the current (1992) water quality standards as established by PaDER must be accommodated in any stream discharge expansion for the Ridley Creek STP. In the alternative, if the Ridley Creek STP cannot be expanded due to stream discharge limitations, and since a spray irrigation alternative for the same discharge is not economically or environmentally feasible, then appropriate wastewater flows must be directed or diverted to the West Goshen STP under the "West Goshen Alternative."

The Bryn Mawr Rehabilitation Center, located in Willistown Township and the William Henry Apartments located in East Whiteland Township, are both currently serviced by existing package plants which discharge directly to Ridley Creek. The current level of discharge for these external facilities does not meet

the required treatment levels as established for the Ridley Creek STP. If these external facilities were eventually taken off-line and each facility was connected to the Ridley Creek STP, the water quality for Ridley Creek would be improved. If the expansion of the Ridley Creek STP is prohibited above 0.4 MGD, another alternative must be considered including the possibility of diverting these flows to the West Goshen STP.

Chester County Sewer Plan - Revised Edition - 1970

The above document is quite ancient and does not adequately describe present or projected conditions for East Goshen Township. Section 1.1 of this Act 537 Plan Update discusses the original county-wide wastewater treatment provisions through 1988. This study projected that by 1988, 12,600 persons residing in East Goshen Township would be served at the West Goshen facility requiring 1.26 MGD at that site. The County plan noted that most of East Goshen Township, including portions of the Ridley Creek drainage area, would be provided with wastewater service via pumping station to the West Goshen STP.

The Chester County master sewer plan is considered to be irrelevant because of its age and because East Goshen Township has provided at least three municipal updates superseding the 1970 Chester County document.

B. Consistency with Chapter 94 Municipal Wasteload Management Plans.

The projected public sewer needs for the Ridley Creek STP, as contained in Table 3.7 of this Act 537 Plan Update, will exceed the present permitted discharge capacity (0.4 MGD) for the STP. The most recent 1991 Chapter 94 report indicates that the existing and the projected connections would cause the plant to reach its hydraulic loading discharge capacity in the mid-1990s. The 1992 Chapter 94 report should reflect 5-year and 10-year additions for projected wastewater needs through the year 2002 and beyond. This will depict a possible need to expand the Ridley Creek STP to a minimum of 0.6 MGD and possibly 0.7 MGD. This would include all known facilities located within East Goshen Township requiring sewage service needs for the next ten years and four external facilities located in Willistown Township and East Whiteland Township which could be connected to the Ridley Creek STP provided the STP is allowed to expand as noted above.

C. State Plans developed Under Title II of the Clean Water Act (33 U.S.C.A. Sections 1281, 1299 or Title II and VI of the Water Quality Act of 1987 (33 U.S.C.A. Sections 1251-1376).

State Water Plan

The Pennsylvania State Water Plan--SWP4-Subbasin 3 for the Lower Delaware River strongly encourages and promotes the recharge of ground water and discourages the direct discharge of wastewater and surface waters. East Goshen Township is in compliance, in part, with the State Water Plan in that the Hersheys Mill Village development containing an ultimate 2,032 dwelling units at build-out will continue to utilize spray irrigation and ground water recharge. Similarly, the Lockwood Chase spray irrigation facility will continue as a municipally-operated facility for 103 total EDUs, 23 of which are located in East Whiteland Township. Therefore, approximately 2,135 ultimate dwelling units will be in compliance with State Water Plan SWP4 for Subbasin 3 in the Lower Delaware River.

The facilities scheduled for additional connections to the West Goshen STP located within the Chester Creek drainage area will continue to be discharged from the West Goshen STP which is currently a stream discharge facility. One of the possible options expected to be contained in the 1992-1993 update of the West Goshen Act 537 Plan is the possibility of spray irrigation for a portion of the effluent to be generated as a result of expansion of the West Goshen STP. It is not expected that any of the additional wastewater effluent (up to 1.0 MGD from East Goshen Township through the year 2002) would be other than direct stream discharge after tertiary treatment (under the present municipal agreement). If the "West Goshen Alternative" is selected by East Goshen Township and is approved by West Goshen Township, up to 1.78 MGD in wastewater flow could be directed to the West Goshen STP.

The possible expansion of the Ridley Creek STP involves increasing an existing point of discharge by up to 0.2 to 0.3 MGD at the site of the present STP. Report 4.0 contained in this ACT 537 Update shows that the spray irrigation of the above 0.2 to 0.3 MGD required at the Ridley Creek STP cannot be made cost effective under any spray irrigation alternative. Therefore, an additional stream discharge permit expansion could be required to accommodate existing developments and future developments within East Goshen Township and those previously identified facilities located outside

of East Goshen Township through the year 2002. If the Ridley Creek STP cannot be expanded beyond 0.4 MGD, a substantial portion of the wastewater flows previously contemplated at the Ridley Creek STP may require diversion under the "West Goshen Alternative."

Water Quality Act of 1987

It is not expected by East Goshen Township that any federal financial assistance will be available to the Township or to the Municipal Authority during the 10-year planning cycle ending in the year 2002. It is possible that some financial assistance may be available for the ultimate connection of facilities located external to the boundaries of East Goshen Township (such as Immaculata College, Bryn Mawr Rehabilitation Hospital, etc.) which are listed for possible ultimate connection at the Ridley Creek STP. It is assumed and expected that East Goshen Township will not qualify for direct Pennvest financial grant assistance but individual residents may qualify for future low interest loans related to connection of existing facilities.

D. East Goshen Township Updated Comprehensive Plan of 1992

All of the proposed additional properties, subdivisions and land developments contemplated within reports 3.0 and 4.0 of this Act 537 Plan are in compliance with the recently-adopted 1992 Comprehensive Plan for East Goshen Township. The existing and amended zoning requirements of East Goshen Township are consistent with the newly-adopted Comprehensive Plan, and this Act 537 Plan Update identifies the sewage facility needs through the estimated time period of Township build-out, currently estimated as being beyond the year 2000.

E. Anti-Degradation Requirements of Chapters 93, 95, and 102

The proposed new sewer service areas identified in Sections 3.0 and 4.0 of this report will be in compliance with the above chapters within the Chester Creek watershed. Any new development within East Goshen Township requires approval under the current Subdivision and Land Development Ordinance and the Chester County Conservation District approval regarding erosion and sediment control (Chapter 102).

Within the Ridley Creek drainage area there is no proposed new point of discharge for municipal or private wastewater treatment facilities. The only

element requiring extensive state approvals will involve the possible expansion of the existing stream discharge permit for the Ridley Creek STP to the extent of 0.2 MGD or 0.3 MGD at site of the present facility. This will not involve any construction external to the 1.0-acre site currently occupied by the STP.

If an application is made to expand the Ridley Creek facility, the current (or higher) stream discharge criteria will be met in the design of the expansion of the Ridley Creek STP. It is also expected that the ultimate future connection of four facilities which are external to the Township boundaries will improve the overall stream quality of Ridley Creek thus resulting in an improvement of the water quality below the Ridley Creek STP.

F. State Water Plans

The consistency requirement with the State Water Plan were discussed in paragraph C above.

G. Preservation of Prime Agricultural Lands Under Title 4 of the Pennsylvania Code, Chapter 7, Subchapter W.

None of the development activities identified in this Act 537 Plan Update located within the Chester Creek drainage area or the Ridley Creek drainage area will affect prime agricultural lands as identified in the heading above and as reflected in the Chester County Soil Survey where such soils are depicted on Exhibit 1B of this Act 537 Update.

H. County/State Stormwater Management Plans

To date (December 1992), Chester County has not prepared or adopted a stormwater management plan for any portion of East Goshen Township. Therefore, this requirement is not applicable. However, the Township enforces rigorous stormwater management requirements in the administration of its Subdivision and Land Development Ordinance for all properties scheduled for development.

I. Wetland Protection Under Chapter 105

East Goshen Township has extensive wetlands as depicted by the hydric soil overlay shown on Exhibit 1B of this Updated Act 537 Plan. The expansion of the Ridley Creek STP will not involve any encroachment into existing wetlands since the stream discharge facilities are already constructed. However, a spray irrigation

alternative would cause wetlands encroachment on or adjacent to the Grace Estate property. East Goshen Township currently reviews each development proposal (including any proposed public sewer extensions) under the Chapter 105 requirements utilizing the current Joint Permit procedures established by PaDER.

Virtually all proposed future public sewer extensions aligned with tributaries of both Chester Creek and Ridley Creek will have some wetland intrusions which are permitted for municipal utility construction. All encroachments are designed as minimal encroachments under the Township's current wetland review process. At this point, it is the belief of East Goshen Township that its need to provide public waste water services to malfunctioning areas and to future development sectors of the Township outweighs any potential degradation.

J. Protection under the Pennsylvania Natural Diversity Inventory

Correspondence has been forwarded to the Bureau of Forestry, PaDER, requesting a PNDI search for the areas outlined under this Act 537 Plan Update in an attempt to provide protection for rare, endangered, or threatened plant and animal species. The response letter is contained in Appendix A. A supplemental request has been made for a PNDI search based on revisions to this Plan.

K. Pennsylvania Historic Preservation Act

It is not expected that any of the proposed public sewer extensions or expansion of the Ridley Creek STP will involve any impact regarding identified historical preservation requirements. Correspondence has been forwarded to the Pennsylvania Historic District Commission noting the recommendations contained in this Act 537 Plan Update. The response from the Commission in contained in Appendix B.

5.2 Resolution of Inconsistencies

It appears that there are two inconsistencies between the proposed public sewer service extensions listed in this updated Act 537 Plan and the regulatory or statutory requirements discussed in Section 5.1 of this report.

The first inconsistency will involve wetland encroachments to extend the public sewer system for certain areas of the Township. First, within the Chester Creek watershed, certain

portions of the recommended gravity sewer system for development of the two (2) Hicks properties in the I-1 and BP Zoning District will involve minor wetland encroachment for gravity sewers. This is permissible under a Section (12) nationwide permit for wetland encroachment or a BDWM-GP-5 permit where an absolute need exists for extension of municipal utility crossings and/or trunk sewer connections. Also, if the Charter Chase subdivision should require an extension of public sewers during the next ten years or beyond, the main pumping station at Green Hill Road and approximately 800 linear feet of gravity sewer to service this subdivision would be built in definite wetlands areas. This inconsistency would also be resolved by obtaining a Section (12) nationwide permit under the Joint Permit procedure.

In addition, when the 129-acre Price property is developed south of Paoli Pike, it is likely that minor sewer extensions will be required in a portion of wetland area in order to connect this property with the existing municipal sewer system. Further, if gravity sewers are provided for Mill Stream Drive along the streambed to Tanglewood Drive, a minor wetland encroachment for public sewer construction would be required and a Section (12) nationwide permit would be required under the Joint Permit procedure.

Ridley Creek Sewer Extensions

Table 3.7 contained in this report identifies several areas which are currently developed or will be developed in the future which may require public sewer extensions north of the Saddlebrook Farms subdivision. A 4,600-foot gravity sewer extension north of Saddlebrook Farms could be constructed in the extreme northeasterly quadrant of the Township and would be connected to the current Willow Pond existing community inground disposal system but would also provide future service connections, if needed, for the Woods property; the Sherman property; portions of the Indian Hills area, if required; the Brookmont/Tremont area; and portions of the miscellaneous areas along north Chester Road.

Portions of the 4,600-foot gravity sewer would necessarily be built within the tributary to Ridley Creek. Another possible alignment along Line Road would avoid extensive intrusions into the adjacent wetlands associated with Ridley Creek but would be less desirable. The resolution of this future wetland inconsistency requires the obtaining of a Section (12) nationwide permit for public sewer extensions.

The other major inconsistency identified in Section 5.1 of this report relates to the permitted stream discharge characteristics and requirements for Ridley Creek and the "protected stream status" of Ridley Creek which prohibits additional wastewater discharge within Ridley Creek unless justified by an

adequate socio-economic study and other factors. In 1992, East Goshen Township felt that a socio-economic study would justify the stream discharge expansion required for the Ridley Creek STP. After more than a year of local review with County agencies and adjacent Townships, it does not appear feasible to undertake the required studies to justify additional stream discharge at this STP.

5.3 Water Quality Standards

The present water quality standards for discharge at the Ridley Creek treatment facility are listed in Figure 2.2 as contained in Section 2.1 of this report. These are the discharge standards currently in effect and the monitoring requirements currently in effect based upon the renewal of the NPDES permit for this facility through October 1995. Generally, the effluent standards differ dependent upon the period of the year. From May 1 to October 31, the $CBOD_5$ monthly average is 10 mg/l in conjunction with 30 mg/l for suspended solids, and 4 mg/l of ammonia as nitrogen. During the winter months (from November 1 through April 30), the $CBOD_5$ is 20 mg/l with suspended solids of 30 mg/l and ammonia at 12 mg/l.

In anticipation of the possibility of expanding the Ridley Creek treatment facility, the Township directed a letter to PaDER during June 1990 requesting expansion discharge criteria. The PaDER response letter dated July 2, 1990 indicates the following information:

> "Preliminary treatment requirements for an increase of discharge (0.4 MGD to 0.7 MGD) into Ridley Creek from the Township's Bowtree facility have been developed.
>
> As per my letter of May 30, 1990, an increase in discharge to a stream designated as High Quality cannot be considered unless your report on necessary economic or social development of significant public value is approved. Given approval, the alternative of increased stream discharge can be reviewed.
>
> Tertiary treatment ($CBOD_5$ is 15 mg/l or less) with a high degree of nitrification (NH_3-N 5 mg/l or less) plus suspended solids of 10 mg/l are the estimates. Please note that these requirements are preliminary in nature. They are offered only to aid in the preparation of the required alternatives analysis."

In December 1992, it was considered possible by the Consultant, the Township administration and the Municipal Authority consulting engineer that the above quoted preliminary stream discharge standards could be obtained and maintained at

the time of expansion of the Ridley Creek treatment facility. However, based on later preliminary reviews with PaDER personnel and consultation with other review agencies and adjacent Townships, it now believed in 1994 that obtaining an additional stream permit for the Ridley Creek STP may not be feasible.

5.4 Preliminary Cost Estimates for New Construction, Authority Financing On-Going Administration, Operation and Maintenance

Attached hereto as Appendix C is a copy of the Municipal Authority's Operation and Maintenance budget for 1992 and for 1993. These budgets show that the Authority, working under the financial direction of the Township Administration, has ample revenues for continued operations of the municipal sewerage system. It can be expected that there will be a need for increased revenues during the two five-year planning cycles, 1993-1997 and again for 1998-2002.

The increased revenues will be required to support an increased operating budget expected as a result of the need to expand the Ridley Creek treatment plant or to direct flows to West Goshen Township, to monitor approximately 500 existing individual onlot systems, to monitor existing community onlot and spray irrigation systems, and to provide the design coordination and environmental studies required to provide appropriate wastewater treatment facilities for existing properties. Sections 3.4 and 3.5 of this report outline the future sewer needs for each of the five-year planning periods ending in the year 2002. Tables 3.6 and 3.7 depict the future probable public sewer connections for each five-year planning period and certain facilities which will have a need for access to public sewers beyond 2002.

It is the Township's policy that the design costs and construction costs for all public sewer extensions to service new land developments and new subdivisions will be totally paid by the respective developers of each such property. The Township provides assistance to the extent of local review and local approval of such public sewer extensions including the proper coordination of design to service future adjacent extensions.

For example, in reference to Table 3.6, when the Price property located at Paoli Pike and Ellis Lane is developed, the developer/applicant will bear all costs of design, permits, and construction including municipal escrow costs for proper inspection. The Township and Municipal Authority costs would be negligible for this type of development and for most of the extensions noted in Tables 3.6 and 3.7.

The same logic applies for existing developments which are located externally from the boundaries of East Goshen Township,

such as the Bryn Mawr Rehabilitation Hospital located in Willistown Township along Paoli Pike. If this facility is ultimately connected based on the approval of expansion of the Ridley Creek STP, the Bryn Mawr Rehabilitation Center will pay all design costs and construction costs for the necessary gravity sewer extension along Paoli Pike and connection to the extended SmithKline Beecham gravity sewer.

There are several existing developed properties within the Township where the Authority and the Township may have to pay for initial design and permit costs but subject to an appropriate reimbursable financial formula assessing the residents of that particular development for all costs directly related to the public sewer extensions. In other areas of the Township, particularly north of Oneida Lane up to and including the Brookmont/Tremont Drive area, there is a need for the Township to do some initial design and coordination with various property owners to assure that public sewers are extended when needed.

For example, a direct gravity extension from the existing Willow Pond community system along Forest Lane to the stream and along the stream paralleling Line Road to the Saddlebrook Farms gravity sewer would cost approximately $400,000. The 28 residents of the existing subdivision could not afford $14,285 per dwelling unit to make an immediate connection to the Ridley Creek STP facility. However, the cost for such a gravity sewer extension would be cost effective if the cost for such an interceptor sewer was paid proportionately by the future developers of the Woods property, the Sherman property, including a proportionate distribution for future connections to the Brookmont/Tremont Drive area of the Township. For future reference, this proposed gravity interceptor is called the "Line Road Interceptor" although the piping system would be closely aligned with the tributary of Ridley Creek crossing Forest Lane and extending in a northerly direction towards the Brookmont/Tremont Drive area.

Table 5.1 shows preliminary costs estimates for selected new public sewer extensions within the Chester Creek and Ridley Creek watersheds. Within Table 5.1, if the Millstream Drive area required public sewer connection during the next ten-year planning period, this all-gravity system would connect with existing gravity sewers within Tanglewood Drive above Bell Flower Lane and would service an estimated 25 EDUs at an estimated cost of $7,200 per unit (1992 dollars).

If the Mill Valley area of the Township required connection to the Chester Creek system in the next ten years, the estimated cost would be $110,000 using the existing (capped) gravity collection system and a pump station/force main at an estimated

TABLE 5.1

PRELIMINARY COST ESTIMATES FOR SELECTED NEW PUBLIC SEWER EXTENSIONS

Chester Creek

Area	Total Cost No Tap Fee (Construction Costs Only)	Type of System	Timing
Charter Chase	$925,000[1]	Gravity/GP Force Main	1998-2002
Mill Valley	$110,000	Gravity/ Force Main	1998-2002
Millstream	$180,000	Gravity	1998-2002

(1) The cost of the total collection and force main system ($925,000), less the cost of pump station and force main ($270,000) plus the cost of a gravity sewer through Hersheys Mill ($528,000) would increase the cost to $1,183,000.

Ridley Creek

Willow Pond/ Woods Property/ Sherman Property (Line Road Interceptor)	$395,000	Gravity	1998-2002
Ridley Creek STP Expansion (Stream Discharge)	$1,200,000[2]	Convert to A/O Process	1998-2002 (start 1993)

(2) $5,175,000 if spray irrigation was possible using 65 acres for spray fields

cost of $4,400 per EDU (1992 dollars). However, this system could not be connected at this cost unless a force main system was designed and in place for the Charter Chase subdivision. If the Charter Chase area remains viable with continued use of onlot individual systems through the year 2002, the cost of providing sewers to the Mill Valley area of the Township would be increased since the force main would have to be extended westwardly to the Brandolini property now under development at the southwest corner of Route 202 and Morstein Road.

For the Charter Chase area, the estimated cost for a combined gravity/grinder pump collection system and a major pumping station with a 5,300-foot force main extending westwardly along Greenhill Road and across Boot Road to Windsor Drive in West Goshen Township would cost approximately $925,000 or approximately $9,500 per EDU. If in the alternative, a gravity sewer was designed through the Hersheys Mill area from Green Hill Road to a point located 600 feet east of the end of Meadowbrook Lane, the cost of such a gravity system would be approximately $528,000 (1992 costs) with no additional EDUs. With the cost of the major pumping station and 5,300 linear feet of force main deleted ($270,000) and with the cost of the gravity system added ($528,000), the estimated cost to service Charter Chase would be $1,183,000 (1992 costs) or $12,070 per EDU. This latter option is not economically feasible or cost effective.

Ridley Creek Watershed

Within the Ridley Creek watershed, there is one major need which will require an analysis by the Township and the Municipal Authority related to the proposed "Line Road Interceptor." Sewer extensions are planned for construction to service the Saddlebrook Farms subdivision. An interceptor paralleling Line Road but following the basic streambed alignment and extending to Forest Lane and into the Sherman property would be required to serve a number of future sewer service needs. First, it is desirable to consider connecting the Willow Pond system to the Ridley Creek STP during the next ten years. The Willow Pond community system malfunctioned during recent years and the absorption beds were rebuilt in 1992 by the Homeowners' Association. It cannot be determined at this time if this community-type system will remain viable for any extended period of time. Portions of the Woods property and the Sherman property may be proposed for development during the same ten-year time frame. A 4,600-linear foot Line Road interceptor could service all three properties and would allow for a future extension to service the Brookmont/Tremont Drive area if needed. The Line Road interceptor would require a cost of approximately $395,000 (1992 dollars) and it has the potential to service 151 potential EDUs, 28 of which are built within the Willow Pond community.

Also depicted in Table 5.1 is an estimate of the cost of increasing the capacity of the Ridley Creek STP from 0.4 MGD to 0.7 MGD, if permitted. This basic cost is estimated at $4/gallon although the cost of the mechanical conversion process is slightly over $3/gallon for the additional capacity. The conversion process from an extended aeration stream discharge plant facility to the anaerobic/oxic process requires a great deal of design which is proportionately higher than the design of a new system. In addition, the Township would be required to prepare and/or review extensive socio-economic benefit studies and analyses to qualify for any additional stream discharge capacity into Ridley Creek.

It should also be noted that if PaDER or any other agency required East Goshen Township to design the 0.3 MGD expansion of the Ridley Creek STP using the AO process but with the spray irrigation of the additional effluent, the cost could exceed $5,175,000 for this expansion. This additional cost is related to a need to purchase or condemn up to 75 acres of land (which is not available) at an estimated cost of $55,000 per acre plus the additional cost of $400,000 for spray field pumps and piping. Thus, a cost in excess of $17.25 per gallon of additional effluent treated could never be made cost effective.

5.5 Methods of Financing Alternatives

The East Goshen Township Municipal Authority is not an operating authority but has an Authority operating budget which is funded by various sources of revenue. The "Lease-Back Arrangement" with the East Goshen Township Board of Supervisors allows the Authority to conduct its operations without impacting upon the Township's revenues and expenditures. In short, the Municipal Authority's operating budget is totally offset by the revenues derived from tapping fees, sewer rental fees, and miscellaneous permit income sources.

Appendix C contains a summary of the revenues for 1991 and 1992 and the operating budgets for those years. Appendix C also depicts the projected 1993 revenue and 1993 operating budget.

The current (October 1993) sewer tapping fee is $2,118 per EDU except for pre-1991 agreement/commitments which will be collected at the rate of $1,500/EDU for the Chester Creek system and $2,975/EDU for the Ridley Creek system.

The source of revenue for the Township's sewer operating budget is the sewer rental charge of $54 per quarter for single-family DUs (or $216/DU per year) and $46 per quarter for apartment units ($184/DU per year).

The resulting total sewer revenue for 1991 and 1992 was $749,616 and $803,075, respectively.

The actual sewage facility operations expenditures for 1991 totalled $813,258 with a projected $1,036,450 for 1992. The projected operating budget for 1993 is reflected as $1,798,671. The Municipal Authority has a bonded indebtedness of $221,000 as of December 31, 1992, which requires annual debt service payment of approximately $(30,000+/-). In addition, the Authority has annual fixed payments based upon the amended agreement with West Goshen Township which requires annual payments of $20,472. Therefore, the Authority is in excellent operating financial condition.

Table 5.1 in this report lists five areas which have to be given consideration under financing alternatives available. Based upon the per capita income levels for various sectors of the Township and the entirety of East Goshen Township as established in 1990, it is not likely that the Municipal Authority will be able to take advantage of direct Pennvest grants and/or low interest loans. Therefore, all financing for future facilities during the period 1993-2002 must be based upon: a) increased sewer rentals if required; b) increased sewer tapping fees within the permitted limits of the Pennsylvania Statutes, as amended; and/or c) additional bond issues.

Chester Creek Sewer System

Table 5.1 lists three areas located in the northerly portion of the Township which may require public sewer construction between 1998 and 2002. Under current Township and Municipal Authority policies, the total cost of providing sewers, if required, to Charter Chase, Mill Valley, and the Mill Stream areas would be directly offset by assessments to each DU served, and based upon the most cost effective design achievable at the time of need.

It is now likely that East Goshen Township will need additional capacity at the West Goshen Treatment Plant. Section 2.2 of this report outlines estimated costs for the West Goshen STP expansion. If West Goshen opts to expand to 7.0 MGD (a 2.5 MGD expansion) and at an estimated cost of $7,700,000, this would equate to an approximate cost of $3.00/gallon. If the additional sewage treatment capacity need (possibly 100,000 to 780,000 gpd) should arise during 1993-1994 with all parties being agreeable as to need and timing, the Municipal Authority and the Township could contemplate an expenditure of $400,000 to $3,000,000 in the mid to late 1990s which could require a separate bond issue for financing in advance of construction.

Ridley Creek Treatment Plant

The expansion of the Ridley Creek STP would cost approximately $1,200,000. Since the asset comprising the expansion of the STP is not realized until completion of the project, this expansion will also have to be financed through a municipal bond issue with some advance funding for design, permits and environmental studies provided by the Authority.

The Line Road Interceptor which would eventually serve the Willow Pond Development, the Woods property, and the Sherman property, and other northerly areas of the Township is currently anticipated as being financed entirely by developer contributions and/or Homeowner Association contributions (Willow Pond). Some initial design expense, possibly $50,000 to $75,000, may have to be funded by the Municipal Authority which could be recovered in direct assessments to the ultimate users of the facility.

In summary, the East Goshen Township Municipal Authority's financing capabilities are adequate, and it is within the ability of the Authority to fund and carry the appropriate debt service.

6.0 SELECTED WASTEWATER TREATMENT ALTERNATIVES FOR THE PERIOD 1993-2002

6.1 Selected Alternatives Within the Ridley Creek Treatment Plant Expansion

All of the evidence collected and conclusions reached in the preceding sections of this 1992/1994 Act 537 Plan Update suggest that the Ridley Creek STP should be expanded beyond the present discharge permit requirements which now total 400,000 gpd. The STP has now been dedicated and accepted by the East Goshen Municipal Authority and has been under the operational control of the Township since 1985.

The wastewater treatment requirements within the Ridley Creek STP service area within East Goshen Township and including peripheral areas located adjacent to the Township boundaries in Willistown Township and East Whiteland Township show a need to expand to approximately 787,000 gpd in theoretical wastewater flow extending beyond the year 2002. Table 6.1 depicts the wastewater treatment needs within this entire wastewater service area up to the year 2002 and including potential needs beyond this period.

The individual areas of the Township and the future subdivisions, land developments, etc. are depicted in Table 3.7 which provides the basis for the information depicted in Table 6.1. As of October 1992, the Ridley Creek STP handled the wastewater needs totalling 333,127 gpd in theoretical effluent flow with actual estimated October 1992 wastewater flows of 230,475 gpd. Thus, the STP was operating at 83 percent of its permitted theoretical hydraulic flow and at a level of 58 percent of its permitted discharge limits at the end of 1992.

The "committed" additional flows depicted in Table 6.1 would account for an additional 157,400 gpd in theoretical EDU wastewater flow and approximately 118,888 gpd in projected actual committed additional treatment needs. It must be noted that 93,700 gpd of the committed 157,400 gpd is already pre-paid by the respective parties and/or property owners depicted in Table 3.7 of this report.

If the Township made no further commitments whatever, the theoretical hydraulic loading of the Ridley Creek STP would be 490,527 gpd and the estimated actual flow from connected and committed additional units would be 349,363 gpd. This would represent 123 percent of permitted theoretical daily flow and 87 percent of the maximum permitted discharge limit of 400,000 gpd.

TABLE 6.1

WASTEWATER TREATMENT NEEDS
RIDLEY CREEK STP SERVICE AREA
1992-2002 AND BEYOND

STATUS/NEED		THEORETICAL WASTEWATER FLOW	GPD ESTIMATED ACTUAL WASTEWATER FLOW
October 1992 On-Line Avg. Daily Treatment		333,127 GPD [1]	230,475
Committed additional flow	Subtotal	157,400 GPD 490,527 GPD	118,888 349,363 GPD
Probable New Needs 1993-1997	Subtotal	42,750 GPD[2] 533,277	42,210 391,573
Probable Additional Needs 1998-2002	Subtotal	168,600 GPD[2] 701,877 GPD	151,777 543,350
Potential Needs Beyond 2002	Total	85,300 GPD 787,177 GPD[3]	63,949 607,299[3] [4]

Notes:

(1) Theoretical Flow Based on 350 GPD for SF-EDUs and 200 GPD per Apartment EDU per Table 3.7

(2) SF and Apartment EDUs are Estimated at 69% of Theoretical GPD Flow. All Other Uses are 100% of GPD shown in Table 3.7.

(3) Does not Include Additional 132,700 GPD for Immaculata College Requested in November 1992.

(4) Does not Include 26,000 in additional capacity requested by William Henry Apartments on April 11, 1994.

The probable additional treatment needs for the period 1993-1997 would add an additional 42,750 gpd in theoretical flow and 42,210 gpd in estimated actual flow. This would extend the Ridley Creek STP to a level of 133 percent of its rated theoretical hydraulic capacity and 98 percent of its permitted hydraulic discharge capacity. This data will be altered based on the West Goshen Alternative.

Table 6.1 also projects the probable wastewater treatment needs for the period 1998-2002. The projected needs as derived from Table 3.7 of this report would add an additional 168,600 gpd in theoretical flow to the Ridley Creek STP and an estimated actual hydraulic loading of 151,777 gpd. In summary, by the year 2002, the Ridley Creek STP would be required to treat 701,877 gpd in theoretical flow and 543,350 gpd in estimated actual wastewater flow. These respective figures represent 175 percent of current permitted theoretical wastewater loading and 136 percent of the estimated actual discharge based on current discharge permit requirements.

In addition, the Township has opted to look at the wastewater treatment needs just beyond the 10-year planning cycle ending in the year 2002 with such needs also being portrayed in Table 6.1. If such facilities were needed, the Ridley Creek STP would have an additional 85,300 gpd in theoretical flow needs and 63,949 gpd in estimated actual wastewater flows. In summary, the final totals for the ultimate wastewater treatment needs in the Ridley Creek STP service area would approximate 787,000 gpd in theoretical wastewater flows and just over 600,000 gpd in actual wastewater flows. It is expected that current infiltration and inflow for the present and future sewer systems would increase slightly extending the needs well beyond 600,000 gpd in actual treatment capacity and discharge rating for this STP. In addition, footnote 3 to Table 6.1 clearly notes that the recently requested additional treatment availability for 132,700 gpd as received from Immaculata College in November 1992, is not included in Table 6.1. The above data will be altered by the West Goshen Alternative.

Based upon environmental concerns and possible PaDER rejection of the expansion of the Ridley Creek STP beyond its current permitted discharge of 4.0 MGD, the "West Goshen Alternative" must be given consideration at this point to avoid an overload at this STP. The figures shown in Table 6.1 were correctly stated for the period ending in 1992. Since 1992, Immaculata College, located in East Whiteland Township has confirmed its request for a total of 137,700 gpd in sewage treatment capacity. Also, the owners of the William Henry Apartments, located at King and Frazer Roads in East Whiteland Township have increased their requested total treatment from the current 59,000 gpd now being discharged to Ridley Creek to a total of 96,000 gpd (based on correspondence dated April 13,

1994). This would add approximately 158,200 gpd to the bottom line figures shown in Table 6.1. The Bryn Mawr Rehabilitation Hospital, located in Willistown Township, has not responded to recent requests from East Goshen Township as to their continued interest in connecting to the East Goshen facilities. However, this need still exists and will be carried forward.

However, if in fact, the Ridley Creek STP cannot and will not be expanded beyond 4.0 MGD, the 607,299 gpd reflected in the last column of Table 6.1, in addition to the additional 158,200 gpd expected from the William Henry Apartments and the Immaculata College complex, or 765,499 gpd could not be handled at the Ridley Creek facility. In summary, approximately 365,500 gpd in ultimate actual wastewater flow for the year 2002 and beyond would have to be diverted to West Goshen Township by the most appropriate conveyance means.

Regarding Table 3.7 in Section 3.0 of this report, there are a number of changes which could be made in transferring wastewater flows to Chester Creek. For example, the 84,420 gpd (New Kent Apartments) currently on line at Ridley Creek STP could be immediately transferred to the West Goshen STP with little additional cost and no major impact other than increasing the present 1.0 MGD limitation with West Goshen Township. In addition, the 55,000 gpd shown for SmithKline Beecham in Table 3.7 could be removed from future consideration for treatment at the Ridley Creek STP since Beecham has no building plans during this century. Beecham has already pre-paid for 40,000 gpd in reserved sewage capacity at the Ridley Creek STP. The above two facilities would result in a reduction of 55,000 gpd for Beecham, and an immediate transfer to Chester Creek or 84,420 gpd, or a total wastewater flow reduction of 139,420 gpd at the Ridley Creek STP. By deducting out the New Kent Apartments which could be transferred to Chester Creek, and eliminating the additional 55,000 gpd requested by Beecham, the resulting excess sewage flow to Ridley Creek as depicted in Table 6.1 would be approximately 226,000 gpd.

The Selected Alternative for Ridley Creek Wastewater Treatment Area

Based upon the above analyses and all preceding documentation contained in this report and the 1993-1994 changes noted herein, the primary selected alternative for the Ridley Creek wastewater treatment area is to:

A) Limit ultimate EDU connections to the Ridley Creek STP to an actual discharge limit of 0.4 MGD.

B) Convey all excess wastewater generated within the Ridley Creek Watershed (including East Whiteland and Willistown flows) to the West Goshen STP by way of new and future conveyance systems.

C) Consider the Ridley Creek STP expansion as the best secondary alternative in the event the West Goshen STP cannot be expanded for reasons not yet identified.

D) Retain a third preference alternative which would involve utilizing spray irrigation methods for all excess wastewater generated at the Ridley Creek STP beyond 0.4 MGD. This would represent the least cost effective method of wastewater treatment and could involve condemnation or purchase of the entire Grace Estate parcel.

Only the primary and secondary alternatives above are discussed further in this Section and in the Plan Summary.

PRIMARY SELECTED ALTERNATIVE - LIMITING RIDLEY CREEK STP TO 0.4 MGD

Under this primary selected alternative, the Ridley Creek STP would be voluntarily limited to 0.4 MGD using the figures depicted in Table 6.1 and Table 3.7 of this report. The following would also be required:

- Redirect the sewage flows from the New Kent Apartments to the West Goshen system (diverts 84,420 gpd).
- Eliminate the SmithKline Beecham "future probable flows" beyond present purchased and committed capacity (deletes 55,000 gpd).
- Continue to provide treatment service for all facilities shown in Table 3.7 including all committed and on-line (less New Kent Apartments), and all EDUs committed or in progress for connection containing an actual (not theoretical) daily flow of 264,943 gallons. In addition, the following properties listed below all located within the Township would be provided future service at the Ridley Creek STP:

- Committed	264,943 gpd
- Spinozzi and McCloskey -	3,500 gpd
- The Woods Property -	30,100 gpd
- Willow Pond -	9,800 gpd
- Indian Hills -	15,050 gpd
- Sherman Property -	12,950 gpd
- Brookmont/Tremont -	15,400 gpd
- North Chester Road	
- 82 miscellaneous EDUs	28,700 gpd
- Old Orchard/Ivy/Raewyck -	10,150 gpd
Total Future Flow -	390,593 gpd

- Retain the "Line Road Interceptor" as a conveyance method for connecting the Northeast Quadrant of the Township to the Ridley Creek STP.

- Require East Whiteland Township as the sponsor and Immaculata College (137,200 gpd) and the William Henry Apartments (96,000 gpd) to collectively design, fund, and construct a gravity sewer extending from King Road near Frazer Road along the Ridley Creek tributary which crosses Mill Stream Drive to Hershey Mill Road and thence along Hershey Mill Road to Greenhill Road.

- At Hershey Mill Road and Greenhill Road, construct a major new pumping station adjacent to the Hersheys Mill Estates pumping station with a force main extending westwardly along Greenhill Road, across Boot Road and to the most appropriate gravity connection where 233,000 gpd or more can be handled by the existing gravity system. This pump station force main option would allow for future service from both Immaculata College, the William Henry Apartments, as expanded, and other East Whiteland Township EDUs which may be identified in the future to be conveyed directly to the Chester Creek STP. There is a distinct advantage in that should public sewers be needed within Charter Chase or Goshen Downs, pressure connections could be made from future gravity sewers for either subdivision. This would also allow for a future interconnection with the Hersheys Mill Estates pumping facility should there be a need for temporary alternative pumping.

If all of the above options are executed, substantial additional flows would be conveyed to the West Goshen STP. However, should West Goshen Township be prevented for any reason from expanding the Chester Creek STP based on a change in stream quality discharge criteria within Chester Creek, then East Goshen Township should be prepared to look carefully at its second selected alternative.

THE SECOND SELECTED ALTERNATIVE - EXPANSION OF THE RIDLEY CREEK WASTEWATER TREATMENT FACILITY

If the West Goshen alternative cannot be effectuated either by way of excessive cost, environmental constraints for expansion of the Chester Creek facility, or other reasons, East Goshen Township must still be prepared to move forward with a means of providing additional sewage service. This would involve an expansion of the Ridley Creek STP as originally outlined in the December 1992 version of this Updated Plan. If expansion of the Ridley Creek STP becomes the only alternative available, a number of important steps must be taken in order to expand this facility.

The greatest hurdle in accomplishing this STP expansion will involve the preparation of the required socio-economic studies needed to justify an increase in stream discharge permit capabilities for Ridley Creek at the site of the present STP. It may take five years or more of concentrated effort to properly design and obtain the necessary permits for the additional treatment required within the Ridley Creek wastewater treatment area.

Detailed studies prepared by and for the external facilities which are requesting direct connections to the Ridley Creek STP will undoubtedly show an overall improvement of the water quality within Ridley Creek. Specifically, the current Ridley Creek tributary stream discharge characteristics for the Bryn Mawr Rehabilitation Hospital, the William Henry Apartment Complex, and the portion of Immaculata College all currently discharging to Ridley Creek undoubtedly would have higher treatment levels at the Ridley Creek STP as compared with the current package plant discharges associated with these facilities. It must be shown conclusively that the ultimate water quality of Ridley Creek above and below the Ridley Creek STP will be maintained or improved as a result of expansion of the Township sewage treatment facility.

Ridley Creek has a protected high quality stream status and no additional discharge is currently permitted without approval of the required socio-economic study showing the specific benefits which will be derived as a result of expansion of the Ridley Creek STP.

Initial analyses show that the Ridley Creek STP can be expanded within the present site from 400,000 gpd to 700,000 gpd without duplicating the facilities now existing on the site. The manufacturer of the major components at the STP (Davco) concurs that the plant facility can be expanded to a maximum of 700,000 gpd using the Anaerobic/Oxic A/O process. The spray irrigation alternative for any additional effluent above 400,000 gpd in permitted discharge capacity is not and cannot be

made cost effective because of lack of available land facilities, potential high condemnation costs, and the added additional pumping costs to spray irrigate such additional effluent south of the site of the present STP. Therefore, the Township should proceed with the design/expansion options which are available.

A great deal of effort will also be required in resolving the high BOD loading at the current plant which is directly attributable to the dilution factor of wastewater influent at the plant. The Ridley Creek STP cannot be allowed to reach its BOD discharge limits prior to reaching the permitted hydraulic discharge limits of 400,000 gpd. Also, for all additional future wastewater treatment needs at the Ridley Creek STP, the excess BOD loading limits must be resolved at the present permit levels prior to proceeding to plant expansion.

6.2 West Goshen (Chester Creek) Wastewater Treatment Selected Alternative as Amended by the "West Goshen Alternative"

The selected wastewater treatment alternative for the Chester Creek (West Goshen) sewage treatment plant service area is to continue in making permitted connections in accordance with the commitments and future probable needs depicted in Table 3.6 of this report plus the new needs identified in the "West Goshen Alternative." The current and long-standing agreement with West Goshen Township to treat 1.0 MGD in actual wastewater flow will continue through the year 2002 and beyond. Table 6-2 depicts the 1992 status and future needs for additional wastewater treatment in accordance with the five-year and ten-year planning cycles and beyond the year 2002. Table 6-2 reflects the latest observed theoretical average daily flows to the West Goshen STP and the estimated or actual monitored average daily flow which is approximately 77.44 percent of theoretical flow.

In 1992, theoretical flows were approximately 974,600 gpd with estimated monitored flow of 754,769 gpd. The committed additional projects requiring wastewater treatment, as depicted in Table 3.6 of this report, would generate 88,295 gpd in theoretical flow and 80,737 gpd in estimated actual flow. At this point, when all such connections are made, the theoretical wastewater flow to the West Goshen STP would be 1,062,894 gpd, but the actual estimated flow will be 835,466 gpd.

The probable new treatment needs as derived from Table 3.6 of this report would add an additional 61,744 gpd and an estimated actual average daily flow of 48,840 gpd.

In summary, at the end of 1997, the theoretical wastewater flow to the West Goshen plant would be 1,124,638 gpd and real flow would be 884,306 gpd. However, it is assumed, in accordance with footnote 1, that the current ratio of actual to theoretical

TABLE 6.2

WASTEWATER TREATMENT NEEDS
CHESTER CREEK (WEST GOSHEN) STP SERVICE AREA
1992-2002 AND BEYOND

STATUS/NEED		THEORETICAL WASTEWATER FLOW	GPD ESTIMATED ACTUAL WASTEWATER FLOW
October 1992 On-Line Avg. Daily Treatment		974,599 GPD	754,769 GPD[1]
Committed additional flow	Subtotal	88,295 GPD 1,062,894 GPD	80,737 GPD 835,466 GPD
Probable New Needs 1993-1997	Subtotal	61,744 GPD 1,124,638 GPD	48,840 GPD 884,306 GPD
Probable Additional Needs 1998-2002	Subtotal	108,074 GPD 1,232,712 GPD	88,832 GPD 973,178 GPD
Potential Needs Beyond 2002	Total	46,250 GPD 1,278,962 GPD	35,816 GPD 1,008,994 GPD [2]

Notes: [1] Current 77.4% actual vs. theoretical flow ratio is assumed to continue for EDU commitments only with positive I&I control and water conservation devices now mandatory.

[2] Does not include 432,620 gpd in additional basin transfers under the "West Goshen Alternative" which emerged in late 1993.

flow of 77.4 percent can be maintained for EDU connections with rigorous infiltration and inflow (I&I) control and based on the fact that water conservation devices are now mandatory for new EDU connections.

Table 6.2 also projects the probable additional wastewater treatment needs between 1998-2002 as being 108,074 gpd in theoretical sewage flow and 88,832 gpd in estimated actual flow. At this future date, or by the year 2002, East Goshen will probably be utilizing approximately 97 percent of the Township's available treatment capacity at the West Goshen STP. The wastewater treatment needs beyond the year 2002 would potentially add 35,816 gpd in additional estimated actual wastewater flow bringing the East Goshen wastewater treatment needs to 100 percent of the 1.0 MGD treatment availability permitted by present agreement.

It is expected that West Goshen Township, by way of an updated Act 537 Plan, will announce in 1994 that design studies are underway to expand the West Goshen STP from 4.5 MGD to a minimum of 6.0 MGD. As noted previously within this study, the West Goshen STP expansion to 6.0 MGD will allow no additional sewage treatment capabilities outside of the West Goshen needs. An alternative expansion plan is expected to be presented which would allow the West Goshen STP to be expanded to 7.0 or 7.5 MGD. Information provided by West Goshen Township suggests that if the 7.0 or 7.5 MGD option is made, that up to 1.0 or 1.5 MGD in additional treatment capacity would be available to surrounding Townships. It is not known at the time of publication of this report if the latter 7.0 or 7.5 MGD option will be approved.

The Township has within its control the ability to constantly monitor and reduce both infiltration and inflow in gravity sewers connected to the West Goshen facility. The Industrial Park contributors are monitored carefully as to their actual flow versus their agreed contribution of daily wastewater per the formula established for industrial and business park facilities. This monitoring should be continued to assure both West Goshen and East Goshen that agreed upon wastewater treatment flows are at or below committed levels.

One of the areas of the Township, the Charter Chase Subdivision containing 98 EDUs, is listed in Table 3.6 as being reserved for ultimate future connection to the West Goshen STP. However, as noted elsewhere in this report, the 32,550 gpd reservation may not be needed if the Township-wide onlot sewage facility monitoring program is successful. This would eliminate 32,550 gpd from the sewage flows depicted in Table 6.2 and would provide a more comfortable margin between actual wastewater flows and the agreed upon 1.0 MGD in maximum daily effluent to be treated. If a new Agreement with West Goshen is negotiated for

up to 780,000 gpd in new capacity under the "West Goshen Alternative," Charter Chase would be included.

The PaDER will soon review both the West Goshen Act 537 Plan Update and the East Goshen Act 537 Plan Update. The PaDER may recommend to East Goshen Township that a "cushion or buffer" is necessary to serve future but yet unknown needs beyond the year 2002. East Goshen Township should be prepared for such a directive during 1994. Notwithstanding any directives from the PaDER, East Goshen Township could complete its build-out within the Chester Creek wastewater treatment area without exceeding the current 1.0 MGD agreement with West Goshen Township. However, if additional capacity can be acquired at a reasonable cost, it should be pursued (under the West Goshen Alternative).

Since late 1993, East Goshen Township has been seriously evaluating the "West Goshen Alternative." This alternative would involve a substantial diversion of flows from the Ridley Creek Watershed to the Chester Creek Watershed. Since the Township has now selected the West Goshen Alternative as the primary alternative, it is important to note here the impact that this alternative will have on the overall sewage collection and treatment plans for the Township.

One of the most important features of this alternative would be preserving the sewage flows for properties located within East Goshen Township for ultimate treatment at the Ridley Creek STP while diverting other flows (including East Whiteland facilities) to West Goshen. This Section 6.2 of the report contains new material describing how the external flows would be directed to West Goshen. Specifically, all of the probable external flows depicted in Table 3.7 including potential needs beyond 2002 would go to the Chester Creek treatment facility. In addition to the 1,009,000 gpd shown in Table 6.2, and the individual properties identified in Table 3.6 of this report, the following diversions or possible interbasin transfers would be made:

o	Pre-planned flow to West Goshen per Table 6.2	1,009,000 gallons
o	New Kent Apartment diversion	84,429 gpd
o	Immaculata College	137,200 gpd
o	William Henry Apartments	96,000 gpd
o	Hersheys Mill Commercial	15,000 gpd
o	East Goshen Township Reserve for Infiltration/Inflow	100,000 gpd
	Total Flows to West Goshen Township	1,441,620 gpd

The major external facility not covered above is the Bryn Mawr Rehabilitation Hospital (Willistown Township) at 40,000 gpd which may not be economically feasible to pump from Line Road to a gravity sewer in West Goshen Township. If the Bryn Mawr Rehabilitation Hospital decides that they have a future need to tie in to East Goshen, the 40,000 gpd may be worked out at the Ridley Creek STP rather than create a pump station/force main scenario exceeding two miles in length.

Based on the flows shown above and based upon known developments and future developments identified in Table 3.6, it is possible to convey a total of 1,441,620 gpd to West Goshen Township. This would require an amended agreement with West Goshen Township to the extent of approximately 450,000 gpd. West Goshen has indicated a potential availability of 780,000 gpd. Other East Whiteland properties in the Ridley Creek Watershed may increase this need.

During April 1994, information has been received by the consultant that West Goshen has placed a hold on publishing its Act 537 Plan Update until the East Goshen projections and projections by other townships are received. Further, West Goshen Township wants to establish binding agreements before proceeding to design. This may require direct agreements between West Goshen and East Whiteland Townships and possibly Willistown Township. It is certain that a new agreement must be negotiated with East Goshen Township under the West Goshen Alternative.

It was indicated in April of 1994 that the cost for expansion at the West Goshen STP might reach $6.00 per gallon. Based on the figures shown above, and assuming that 441,620 gpd in excess treatment capacity is required by East Goshen Township and the external facilities, this would represent a cost of approximately $2,650,000 in treatment costs alone plus an

estimated $900,000 for a new Greenhill Road pumping station and force main to West Goshen. It may ultimately be too expensive for the East Whiteland facilities (Immaculata College and William Henry Apartments) to reasonably connect to the West Goshen facility, based on combined treatment and conveyance costs.

6.3 The Selected Alternative for the Hersheys Mill Community (Spray Irrigation) System

Based upon the conclusions reached in Section 4.0 of this report, it is the Township's selected alternative that the Hersheys Mill Community system be continued for at least the next ten years as a privately owned facility. There is ample capacity within the Hersheys Mill treatment facility to handle the ultimate 2,032 maximum permitted EDUs with an estimated additional reserve capacity at the time of build-out of 70,000 to 85,000 gpd.

This facility is well designed, well built, is currently under excellent operational control, and has more than ample capital reserve funding for individual component replacement. East Goshen Township has physically evaluated the plant condition, the management and operation, and has considered the fact that the Homeowners association will assume operational authority in January 1994. The Township sees no need to intervene in this private treatment facility during five-year and ten-year planning cycles extending to the year 2002. However, the Township is fully prepared to monitor this facility on an annual basis, or as deemed necessary, and to continue dialogue with the Board of Directors of the Greenhill Sewer Association during the next ten years.

If, beyond the ten-year planning cycle (beyond 2002), East Goshen Township finds it necessary to have the Municipal Authority take over the Hersheys Mill system for any reason, and if the Charter Chase subdivision has not responded to a rigorous onlot sewage facility monitoring program, there would be possible capacity within the Hersheys Mill system to accommodate the Charter Chase community at a greatly reduced cost factor.

6.4 The Selected Alternative for the Willow Pond Community System

It is assumed that the Willow Pond community comprising 28 single-family detached units will be disconnected from the current community onlot system during the time frame 1998-2002 and will be connected to the Ridley Creek STP subject to the construction of an extended intercepting sewer (the Line Road Interceptor) south of Willow Pond. Although it is possible that the newly constructed inground sewage beds will last beyond this

period, it is prudent to consider a public sewer connection now. The timing of such connection will be totally dependent upon the coordination of construction of gravity sewers south of Willow Pond to the nearest gravity public sewer connection near Saddlebrook Drive.

6.5 The Selected Alternative for Continued Use of Individual Onlot Systems

East Goshen Township will continue the use of individual onlot systems within areas of the Township which are not schedule to receive public sewer extensions by the year 2002. The Township has approved (copy of Ordinance attached) a Township-wide onlot sewage management program during 1994 under the previously described onlot management program. This program will provide for continuous monitoring, reporting and recording procedures, and compliance with mandatory renovations of isolated failed systems. The scheduled public sewer extensions for the Meadowbrook/Cornwallis area and the Highland/Taylor area will reduce the number of onlot individual systems from 699 to 563 such systems. Other potential connections to public sewers are listed in Section 4.2 of this report. It is expected that the condition of such individual onlot systems will actually improve under the jurisdiction of the Township individual onlot management program. Other than the Charter Chase area, already discussed in various sections of this Updated Act 537 Plan, there are no other major areas of the Township which exhibit a need for connection to public sewers prior to the year 2002.

6.6 Selected Alternatives for Public Sewer Service Areas within Chester Creek

The following areas have been selected to be handled as noted:

- Park Avenue (fire house) - Gravity sewer extension.
  Time frame - 1993-2002 - zoned R-3

- Fedor Property - Gravity sewer extension.
  Time frame - 1993-1997 - zoned R-4

- West Chester Pike - Miscellaneous gravity sewer extensions - zoned R-5
  Time frame - 1993-1997

- West Chester Pike Commercial - Gravity sewer extensions - zoned C-4
  Time frame - 1993-1997

- Hicks Property (14.9 Ac.) - Gravity sewer extensions.

Time frame - 1993-1997 - zoned I-1

- Hicks Property (71.5 Ac.) - Gravity sewer extensions.
  Time frame - 1998-2002 - zoned BP

- Price Property - Gravity sewer extensions - zoned R-2
  Time frame - 50 EDUs 1993-1997
  79 EDUs 1998-2002

- Saints Peter and Paul Church - Remain as onlot system to 1997 - possible grinder pump connection by 2002 - zoned R-2

- Green Acres Area and Strasburg Road/Route 352 Area - Remain as individual onlot systems - connect by pump or gravity (as available) after 1998 - zoned R-2

- Charter Chase - Remain as individual onlot systems through 1997 - Reevaluate - possible gravity, grinder pump and force main connection after 1998 - zoned R-2

- Mill Valley - Remain as individual onlot systems through 1997 - possible gravity/force main connection after 1998 - zoned R-2

- Millstream Drive - Same as Mill Valley - zoned R-2

- Divert New Kent Apartments to West Goshen STP

- Immaculata College Complex

- William Henry Apartment Complex

- Hersheys Mill Commercial Area

6.7 <u>Selected Alternatives for Areas Located within Ridley Creek Service Areas</u>.

- Meadowbrook/Cornwallis Area (approved prior to this Act 537 Plan Update) - Low pressure system.
  Time frame - 1993-1995

- Highland/Taylor Area - Gravity sewer extension.
  Time frame - 1993-1995

Future

- Spinozzi-McCloskey - Remain as individual onlot systems - allow for 10 EDU connections (upon need) from 1993-2001.

- SmithKline Beecham - Retain 40,000 gpd (paid and committed).

- Woods/Sherman Properties - Capped sewers - some possible individual onlot systems - public gravity sewer extensions after 1998 or when developed.

- Willow Pond Area - Connect to gravity public sewers 1998 to 2002 or when available.

- Bryn Mawr Rehabilitation Hospital - Gravity sewer extension to SmithKline Beecham system only <u>after</u> STP expansion is approved (or possible force main/pump to West Goshen) may be considered at Ridley Creek STP if other Township properties are deleted.

- Christ Memorial Lutheran Church - Gravity connection through Realen site to Ridley Creek STP.

- William Henry Apartments/Immaculata College - Gravity or force main connections only when STP expansion is approved. This alternative is amended to require disposal at West Goshen STP via Greenhill Road future pump station/force main.

FILE

RESOLUTION FOR PLAN REVISION

RESOLUTION NO. 97-38

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 Resources (Department) 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, the Board of Supervisors of East Goshen Township has adopted a 537 Plan Update approved by the Pennsylvania Department of Environmental Protection in June, 1995, and

WHEREAS, the municipality has now prepared a Special Study to determine the best alternative for obtaining additional sewage capacity projected to serve the ultimate needs of the municipality, and

WHEREAS, the Special Study considered three alternatives to accomplish the acquisition of the projected needed sewage capacity, and

WHEREAS, the recommended alternative determined through this Special Study is to use two phases to increase the discharge permit limits of the Ridley Creek Sewage Treatment Plant (PA NPDES # 0050504) from the existing permit limit of 0.400 MGD to 0.750 MGD, and

WHEREAS, the Plan proposes to reduce the wastewater ratings per equivalent dwelling unit for new construction only,

AND NOW THEREFORE, be it resolved that the Act 537 Special Study for East Goshen Township dated May, 1997 and prepared by Yerkes Associates, Inc. is hereby approved and adopted on this 21st day of October, 1997.

BOARD OF SUPERVISORS

ATTEST

E. Martin Shane, Chairman

Joseph M. McDonough, V/Chairman

John Chatley III, Member

Mary L. Powell, Member

Carmen Battavio, Member

VOLUME I

EAST GOSHEN TOWNSHIP

REVISION TO
OFFICIAL SEWAGE PLAN
ACT 537
FOR
A SPECIAL STUDY AREA

Prepared for

Board of Supervisors
East Goshen Township
Chester County, Pennsylvania

DATE
MAY, 1997
REVISED SEPTEMBER, 1997

Yerkes Associates, Inc.

Consulting Engineers - Land Surveyors
Bryn Mawr, PA *West Chester, PA.*
610-525-6200 *610-644-4254*

Professional Services Since 1874

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VOLUME I

EXECUTIVE SUMMARY

The objective of this Act 537 Plan Revision for a Special Study Area is two fold:

1. To obtain approval to increase the current discharge permit limits of the Ridley Creek Sewage Treatment Plant NPDES permit, PA 0050504, from 0.400 MGD to 0.750 MGD. If approved, the expansion would take place in two phases. The plant was designed to treat 0.500 MGD, therefore the Phase I increase of the discharge capacity to 0.500 MGD would only involve minor modification of existing equipment. The Phase II would increase the discharge capacity an additional 0.250 MGD for a total of 0.750 MGD.

The Township is extremely cognizant of the high quality rating given to the Ridley Creek. It is the intention of this Special Study and the Socio-economic Study attached, to assure the Department that the quality of the stream has not and will not be affected.

2. To obtain approval to reduce the current wastewater ratings, for new construction only, in the following manner:

Type of Use	Current Rating	Proposed Rating
Single Family Dwelling	275 gpd/EDU	225 gpd/EDU
Townhouse	225 gpd/EDU	200 god/EDU
Apartment	225 gpd/EDU	175 gpd/EDU

This request is based on an evaluation of the current flows when compared to the actual number of equivalent dwelling units (EDUs) on line. The request is made for new construction based on the water saving devices that are being required in today's construction.

Upon approval of this Special Study, Phase I of the expansion and implementation of the new wastewater ratings would be used immediately.

A. PLAN SUMMARY

This Act 537 Plan Special Study looks at the alternatives available to East Goshen for obtaining additional sewage capacity to serve the ultimate needs of the Township. The Plan recommends that the Ridley Creek Sewage Treatment Plant be expanded, in two phases, from the existing permitted capacity of .400 MGD/day to .500 MGD in Phase I and to .750 MGD in Phase II. The Consulting Engineer believes the first phase can be accomplished at minimal cost and time since most of the existing equipment was originally sized to treat .500 MGD.

To accomplish this goal, some Ridley Creek Watershed flows currently being pumped to the West Goshen Sewage Treatment Plant (WGSTP) will be diverted to the Ridley Creek Sewage Treatment (RCSTP) and some flows from the Chester Creek Watershed will be diverted to the RCSTP. These transfers should eliminate the need for additional capacity at the WGSTP. The Township has calculated that construction and treatment costs at the RCSTP are more economical than at the WGSTP.

The Department's June 30, 1995 approval of the current Sewage Facilities Plan included several recommendations to be addressed prior to the Township submitting a recommendation for a plan to increase the sewage capacity at the RCSTP to serve the Township's ultimate needs. The following list is a summary of the actions taken pursuant to the approval letter (full details can be found in Volume II).

- The On-lot Management Plan was implemented in July, 1994
- The diversion of flows for New Kent Apartments from the Ridley Creek to the Chester Creek has not been done and is not expected to be done because it flows to Ridley Creek by gravity and would have to be pumped to be treated at the West Goshen Treatment Plant. In addition, treatment costs are lower at the Ridley Creek Plant than at the Chester Creek treatment facility (West Goshen Township Sewage Treatment Plant).
- The "West Goshen Alternative" has been studied and found to be not economically feasible
- The proposed "Line Road Interceptor" has been installed by a developer
- The future connection of the Bryn Mawr Rehab Hospital has been included in the Ridley Creek Sewage Treatment Plant capacity allocations
- The new EDU wastewater ratings are being used

- Studies of alternatives other than the "West Goshen Alternative" have been completed

- Spray Irrigation - This option has been re-examined and still found to be economically unfeasible based on the current cost of raw land in East Goshen Township - See Supporting Documents #13.

B. PLANNING OBJECTIVES

An Act 537 Plan Update for the entire township was completed and approved in June, 1995. That update suggested that the township would need additional capacity to meet its ultimate needs and that expansion of the Ridley Creek Sewage Treatment Plant appeared to be the most cost effective and logical means of obtaining the projected capacity needs. As mentioned previously, the Department's approval recommended that other alternatives be investigated, namely obtaining additional capacity from West Goshen Township and spray irrigation. This Act 537 Plan Special Study has addressed those other alternatives.

Identification of the Study Area

Ridley Creek Watershed - The Ridley Creek Watershed includes all of the area within the Township east of Boot and North Chester Roads.

Chester Creek Watershed - The Chester Creek Watershed includes all of the area within the Township west of Boot and North Chester Roads.

Current Sewage Usage within the Study Area

Ridley Creek Watershed - The Ridley Creek Sewage Treatment Plant (RCSTP) is designed and permitted to treat 0.400 MGD. The total number of EDUs connected at the end of 1996 was 1,165 contributing an adjusted (see 1996 Chapter 94 Report) average daily flow of 275,451 gallons per day or 205 gpd per unit. The currently approved EDU wastewater rating is 275 gpd per EDU.

In addition to the average daily flow of 275,451 gallons, there are 134,850 gallons committed or sold and 1,375 gallons of potential need in the next five years. The projected total of these existing and future needs will exceed the current plant permit by 11,676 gallons per day.

Chester Creek Watershed - The Township/Authority have an agreement for treatment of 1.0 MGD of capacity at the West Goshen Sewage Treatment Plant. The 1996 actual annual average daily flow was 863,503 gpd (including 109,350

gallons is from the Ridley Creek Basin). An additional 276,896 gallons has been committed or sold. These allocations bring the theoretical flow to the WGSTP over the 1,000,000 gallon per day allotment by 140,399 gallons per day.

Estimated Five and Ten Year Projections

(Sewage Needs Based on Land Use permitted under the Existing Zoning with an EDU rating of 275 gpd)

Ridley Creek Watershed - In the 0 - 5 year range, an estimated 79,600 gpd will be needed. In the 5 years and beyond range, there is an estimated need for an additional 166,050 gallons. These projections include the potential needs of the two institutional facilities in Willistown Township (Bryn Mawr Rehab and Christ Memorial Church). These projected needs are illustrated on Exhibit 2-B.

Chester Creek Watershed - Exhibit 3-A illustrates that an estimated 125,262 gpd will be needed in the 0 - 5 year range and an additional 87,725 gpd in the 5 years and beyond range.

Future Capacity Needs

Using the proposed wastewater rating of 225 gpd/EDU:

Ridley Creek Basin	Flow	Chester Creek Basin	Flow
Current Flow to RCSTP	275,451	Current Flow to WGSTP	863,503
Pumped to Chester Creek	-0-	Pumped from Ridley Creek	-109,350
Current Basin Flow	408,182	Current Basin Flow	754,153
0 - 5 year needs	80,000	0 - 5 years needs	63,909
Total Basin Flow 0 - 5 Years	488,182	Total Basin Flow 0 - 5 Years	818,062
5 years and beyond needs	166,050	5 years and beyond needs	87,725
Total Ultimate Basin Flow	654,232	Total Ultimate Basin Flow	905,787

Use of New EDU Wastewater Ratings - In order to gain the maximum amount of capacity at both the RCSTP and the WGSTP, we have reviewed the actual average daily uses for new construction in both basins. The actual average daily flows from both basins have consistently been 75 - 90% of the EDU Wastewater Ratings used to develop the capacity allocations. The Plan proposes to reduce the EDU rating for new construction only from 275 GPD for single family dwellings to 225 GPD; from 225 GPD for townhouses to 200 GPD and from 200 GPD for apartments to 175 GPD.

Out of Basin Flows

Ridley Creek Watershed - There are no out of basin flows being treated at the RCSTP. The currently approved 537 Plan shows that New Kent flows are treated at the West Goshen Treatment Plant, when, in fact, they are part of the Ridley Creek Watershed and are treated at the RCSTP

Chester Creek Watershed - There are 109,350 gpd being pumped from the Ridley Creek Watershed to the Chester Creek Watershed for treatment at the West Goshen Sewage Treatment Plant. An additional 44,000 gpd is currently projected to be pumped to the Chester Creek in the 5 year and beyond range.

C. ALTERNATIVES

Alternative #1

Obtain additional sewage treatment capacity at the West Goshen Sewage Treatment Plant.

Discussions between the East Goshen and West Goshen Board of Supervisors regarding the possibility of East Goshen purchasing an additional 200,000 gpd capacity at the WGSTP took place in Spring, 1996. The purchase of this amount of capacity was found to be not economically feasible; therefore this Alternative has been eliminated. Copies of all correspondence and data can be found in Volume II.

Alternative #2

Feasibility of obtaining treatment capacity from other sources - Westtown Sewer Company - Pursuant to a court order, on December 15, 1996 Westtown Township took over operation of the Westtown Sewage Treatment Plant located on Westtown Road in Westtown Township. The plant has had many problems over the years and has been cited by the Department for violations of operations and maintenance of the plant and the system. At this time, there are too many unknowns for East Goshen Township and Authority to look for additional capacity at this facility. A copy of the article from the Daily Local News pertaining to the take-over is included in Volume II Exhibits.

West Chester Borough Goose Creek Treatment Plant - The Township was recently asked by the Borough about any capacity the Township may need at the Goose Creek Treatment Plant. The Township responded with a need for

approximately 0.200 MGD however there is no economically feasible method of getting any of that sewage to the Goose Creek Sewage Treatment Plant.

These two alternatives have been eliminated from further study.

Alternative #3

For purposes of this Special Study, the findings of the 1995 Plan Update regarding the feasibility of Spray Irrigation are still valid.

According to the June, 1995 study, only two properties exist within the Ridley Creek watershed which contain sufficient acreage to handle the facilities and spray filed necessary for the calculated discharge need of 0.3 MGD. These include the Pfizer (formerly SmithKline Beecham) property located north of Boot Road and the additional possibility of use of all or part of the Grace Estate property located immediately adjacent to and south of the Ridley Creek STP.

The use of the Pfizer property was dismissed for future spray irrigation purposes because of the need to pump treated effluent more than 1.1 miles and the high expected cost of condemnation per acre (assumed to be in excess of $60,000 per acre) in addition to the burden of exceptionally high operating costs for future years.

The Grace Estate, comprising 182 acres, where soils are suitable, could be acceptable for spray effluent areas in its entirety. The June, 1995 Act 537 Plan Update estimated that it would be necessary to acquire the entire westerly half of this property (west of Ridley Creek) and perhaps suitable portions of the property east of the Ridley Creek in order to meet the estimated physical area needs of 75 acres required for the application of spray effluent for an additional 0.3 MGD.

The 1995 study assumed a cost of $55,000[1] per acre for this raw land since acquisition of these major portions of the site would destroy the utility of the balance of the site. A recent sale of raw ground in the township reflected $60,000[2] per acre for development of the entire site. With that in mind, the Grace Estate ground may cost even more than that on today's market.

Using $60,000 per acre, the costs for spray irrigation would be $4,500,000. Additional costs for spray field piping and pumping were estimated at $400,000 for a total of $4,900,000 before the plant expansion costs are even considered.

A complete copy of the 1995 Act 537 Plan Update section pertaining to spray irrigation is included with the Supporting Documents of this submission.

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[1] Information taken from page 4-28 of the June, 1995 Act 537 Plan Update
[2] Based on average land cost for the Wood Estate, sold in 1996

This alternative has been dismissed from further evaluation since it is not cost effective.

Alternative #4

Increase the RCSTP NPDES Permit to 0.750 MGD

This alternative proposes to increase existing NPDES Permit to .750 MGD in two phases.

Phase I - Increase the Treatment Plant to 0.500 MGD -

This phase will take care of the existing on-line and committed or sold capacity. There are no projected additional needs in the Ridley Creek Basin within the 0 - 5 year range however there are projected potential needs in the 5 years and beyond range unless flows are diverted from the Chester Creek treatment facility (WGSTP) to the RCSTP. When the flows at the RCSTP reach the 0.400 MGD the application process with the Department will be started to obtain permission to begin construction to complete the expansion of the treatment facility to 0.750 MGD.

The 5 year and beyond projections consist of existing developments whose on-lot systems are being monitored through the Township's On-Lot Sewage Management Program. These developments are Charter Chase, Mill Valley, Millstream Drive, Indian Hills and the areas of Broookmont/Treemont, North Chester Road and Old Orchard/Raewyck Drives. Capacity must be allocated for public sewers should these on-lot areas fail. Previous walks through the Charter Chase area indicated that some systems were malfunctioning. Notices were sent to the homeowners advising them to repair the systems. A follow-up inspection showed that the repairs were made.

This Plan also recommends that the Potential 5 year and beyond flow that is currently included in the Chester Creek allocations be moved to the Ridley Creek Basin allocations. Since additional capacity is unavailable at the WGSTP, these changes will go toward reducing the capacity projections at the WGSTP.

Accomplishing the Phase I expansion should be more of a "fine tuning" than construction. Most of the equipment currently in place at the RCSTP was originally sized to handle 0.500 MGD therefore only minor modifications should be needed. It is not anticipated that any additional land will be required.

The flows from New Kent Apartments (calculated at 76,800 gpd using 225 gpd/unit) would continue to be treated at the RCTP and be deleted from the Chester Creek allocation.

The flows from Hershey Mill Estates and Fairway Village (49,500 gallons), currently being pumped to the Chester Creek (WGSTP) through the Hershey Mill Pump Station will be pumped to the RCSTP. Approximately 600 feet of force main extension would be required to make this change, starting at a point just beyond the end of Cornwallis Drive to a connection point at the last manhole on Cornwallis Drive where it would reach the RCSTP by gravity. Implementation of these changes will be made if and when the current capacity limit at the West Goshen Treatment Plant appears to be in danger of being exceeded.

An additional 8,250 gallons could be diverted from the Chester Creek Marydell Pump Station which serves 30 single family dwellings. Approximately 500 feet of force main would need to be constructed from the Marydell Pump Station to a manhole in the Ridley Creek system.

Exhibits 3B - 3D illustrate the proposed EDU wastewater allocations for both the Ridley Creek and Chester Creek Basins.

Phase II - Increase the Treatment Plant to .750 MGD

As discussed in Phase I, when the need for additional sewage capacity becomes a reality, it will be necessary to expand the RCSTP an additional .250 MGD to the ultimate .750 MGD. Construction needs to accomplish this expansion are not known at this time. The existing plant is on one acre of land owned by the East Goshen Municipal Authority. A small portion of land may be required from the adjacent open space. Since the open space is owned by the Township, it is assumed a mutually acceptable agreement could be reached by the Township and Authority for acquisition of the needed land.

The ultimate Ridley Creek Sewer Area is shown on Exhibit 4. This plant expansion should serve the township through its ultimate needs as well as provide needed capacity for the adjoining municipality.

Stream Quality Analysis - The RCSTP is permitted as a stream discharge plant; however it is not a direct stream discharge. It should be more aptly labeled an aquaculture treatment system since the treated effluent is filtered through wetlands before entering the stream. An Aquaculture system has been described as those which include natural and artificial wetlands as well as other aquatic systems for the production of algae and higher plants, invertebrates, fish and integrated polyculture foodchain systems. Swamps and bogs are successfully

being utilized as managed "nutrient sinks" for polishing partially treated, or fully treated in the case of RCSTP, effluent.[3]

The RCSTP filtration system was originally accomplished through a manifold system which diffuses the effluent for a distance of several hundred feet above and below the assumed center of the mixing zone. Based on the nature of this type of stream discharge and the results of periodic stream samples taken over the years, the Township, Authority and Consulting Engineer have formed the opinion that the stream quality has not been degraded as a result of the effluent discharge into it.

To further illustrate this point, the Municipal Authority authorized the plant operator to take random samples from the stream at four locations upstream and downstream of the Plant outfall in November, 1996. The samples were taken below the mixing zone, 400 feet below the next tributary, at the outfall of the Ridley Creek and at the point of outfall from the plant. The test samples concluded that the discharge of effluent into the stream had no measurable effect of any type on the stream quality.

The original discharge area has expanded considerably since the treatment plant was put into service in 1985. Further, these specific wetlands are extremely beneficial because they are artificially fed with a constant supply of water and are unaffected by seasonal changes or drought conditions.

The Plant Operator's memo and the complete laboratory report can be found in Volume II. As a point of interest, on the day the samples were taken, a representative of the Department was present and offered suggestions to the operator on sample locations.

Ridley Creek Greenway Project Plan

In November, 1996 the Township Board of Supervisors endorsed the Ridley Creek Greenway Project Plan. This Plan notes that the Ridley Creek Plant filters effluent through the wetlands to the creek. The Greenway Project Committee was impressed with how the RCSTP is run and did not have any comments on the quality of the stream as a result of the stream discharge from the Plant.

D. RECOMMENDED ALTERNATIVE

Alternative #4 is the recommended alternative of this Plan Study.

[3] Innovative and Alternative Technology Assessment Manual, United States Environmental Protection Agency, February, 1980, page A-26

E. IMPLEMENTATION PLAN

The first goal of this 537 Plan Special Study is to increase the Sewage Treatment Plant NPDES Permit limit from 0.400 to 0.750 MGD in two phases. Upon approval of this 537 Plan Special Study, NPDES Permit application Parts I and II will be submitted to the Department to increase the capacity to 0.500 MGD. When the plant flows reach a daily flow of 0.400 MGD, applications will be submitted to the Department to implement Phase II which will be to increase the plant discharge limit to 0.750 MGD.

The second goal is to immediately utilize the revised wastewater ratings for new construction only.

EXISTING FLOWS TO
RIDLEY CREEK SEWAGE TREATMENT PLANT

Wastewater Ratings

Single Family Dwelling = 275 GPD
Townhouses = 225 GPD
Apartments = 200 GPD

AREA TO BE SERVED	ZONED	GPD ON-LINE	GPD COMMITTED & IN PROGRESS @275 GPD/EDU
BOW TREE FARMS - 338 SFD	R-2	92,950	
CLOCKTOWER - 159 SFD	R-2	35,775	
VISTA FARMS - 65 SFD	R-2	17,875	
HUNT COUNTRY - 71 SFD	R-2	19,525	
WENTWORTH - 65 SFD	R-2	17,875	
E.G. ELEMENTARY SCHOOL	R-2	10,000	
PFIZER (AKA SMITHKLINE BEECHAM)	I-2	10,000	30,000
GOSHEN VILLAGE COMMERCIAL	C-5	13,000	
HANCOCK BUILDING (FUCHS)	C-2	3,800	
PHASE II- HANCOCK BLDG		2,400	
PAOLI PIKE (352/PAOLI CORNER)	C-5	5,950	350
TAYLOR/HIGHLAND (64 EDU)	R-2	17,600	
SPINOZZI & MCCLOSKEY (10 EDU)	R-2	1,375	
COVENTRY WOODS (16 EDU)	R-2	1,650	2,750
WATERFORD (26 EDU)	R-2	7,150	
MEADOWBROOK/CORNWALLIS AREA (76 EDU)	R-2	28,950	6,600
BELLINGHAM LIFE CARE	R-2	28,000	
BENTLEY CONSTRUCTION	I-2	900	
PHILA SUB. - HUNT COUNTRY	C-5	157	
NEW KENT APARTMENTS - 384 APTS		76,800	
WOOD PROPERTY (85.9 ACRES - 63 SFD)	R-2		17,325
WILLOW POND (28 SFD) 13 IN WILLISTOWN	R-2	7,700	
TOTALS		397,232	57,025
TOTAL ON LINE/COMMITTED		454,257	

ACTUAL 1996 AVERAGE (ADJUSTED) FLOW 275,451
(SEE 1996 CHAPTER 94 REPORT)

PERCENTAGE OF ACTUAL FLOWS VS ALLOCATIONS 69%

06/29/97
file name: existing RC Flows

EXHIBIT 1
EXISTING FLOWS

EXISTING FLOWS TO
RIDLEY CREEK SEWAGE TREATMENT PLANT
USING REDUCED WASTEWATER RATING

Wastewater Ratings

Single Family Dwelling = 225 GPD for new construction built in last 5 years
Townhouses = 200 GPD
Apartments = 175 GPD

AREA TO BE SERVED	ZONED	GPD ON-LINE	GPD COMMITTED & IN PROGRESS @225 GPD/EDU
BOW TREE FARMS -338 SFD	R-2	76,050	
CLOCKTOWER - 159 SFD	R-2	35,775	
VISTA FARMS - 65 SFD	R-2	17,875	
HUNT COUNTRY - 71 SFD	R-2	19,525	
WENTWORTH - 65 SFD	R-2	17,875	
E.G. ELEMENTARY SCHOOL	R-2	10,000	
PFIZER (AKA SMITHKLINE BEECHAM)	I-2	10,000	30,000
GOSHEN VILLAGE COMMERCIAL	C-5	13,000	
HANCOCK BUILDING (FUCHS)	C-2	3,600	
PHASE II- HANCOCK BLDG		2,400	
PAOLI PIKE (352/PAOLI CORNER)	C-5	5,950	225
TAYLOR/HIGHLAND (64 EDU)	R-2	17,600	
SPINOZZI & MCCLOSKEY (10 EDU)	R-2	1,375	
COVENTRY WOODS (16 EDU)	R-2	1,350	2,250
WATERFORD (26 EDU)	R-2	5,850	
MEADOWBROOK/CORNWALLIS AREA (100 EDU)	R-2	20,900	5,400
BELLINGHAM LIFE CARE	R-2	28,000	
BENTLEY CONSTRUCTION	I-2	900	
PHILA SUB. - HUNT COUNTRY	C-5	157	
NEW KENT APARTMENTS - 384 APTS		67,200	
WOOD PROPERTY (85.9 ACRES - 63 SFD)	R-2		14,175
WILLOW POND (28 SFD) 13 IN WILLISTOWN	R-2	7,700	
TOTALS		363,082	52,050
TOTAL ON LINE/COMMITTED		415,132	
ACTUAL 1996 AVERAGE (ADJUSTED) FLOW (SEE 1996 CHAPTER 94 REPORT)		275,451	
PERCENTAGE OF ACTUAL FLOWS VS ALLOCATIONS		76%	

09/12/97
file name: RC Reduced Wastewater Rating

EXHIBIT 1-A
EXISTING FLOWS
USING REDUCED WASTEWATER RATING

ALTERNATIVE #4
PHASE I
RIDLEY CREEK
TREATMENT PLANT
PROPOSED EXPANSION TO 0.500 MGD

NEW CONSTRUCTION - BUILT IN LAST 10 YEARS
new residential constrution has been calculated at 225 gpd
for single family dwellings and 175 gpd for apartments

May, 1997

May, 1997; revised 9/2/97
file name: RIDLEY PHASE II .500 MGD

AREA TO BE SERVED	ZONED	GPD ON-LINE	GPD COMMITTED OR SOLD	0 - 5 YEARS	5 YEARS AND BEYOND
BOW TREE FARMS - 338 SFD	R-2	78,050	new construction		
CLOCKTOWER - 159 SFD	R-2	35,775	new construction		
VISTA FARMS - 65 SFD	R-2	17,875			
HUNT COUNTRY - 71 SFD	R-2	19,525			
WENTWORTH - 65 SFD	R-2	17,325			
E.G. ELEMENTARY SCHOOL	R-2	10,000			
PFIZER (formerly SmithKline Beecham)	I-2/R-2	10,000	30,000		85,000
GOSHEN VILLAGE COMMERCIAL	C-5	13,000			
HANCOCK BUILDING (FUCHS)	C-2	3,600			
PHASE II- HANCOCK BLDG	C-2		2,400		
PAOLI PIKE (352/PAOLI CORNER)	C-5	5,950	350		
TAYLOR/HIGHLAND (64 EDU)	R-2	17,600			
SPINOZZI & MCCLOSKEY (10 EDU)	R-2	2,425	225	new construction	
COVENTRY WOODS (16 EDU)	R-2	3,600	new construction		
WATERFORD (26 EDU)	R-2	7,150			
MEADOWBROOK/CORNWALLIS AREA (100 EDU)	R-2	19,800	6,300		
BELLINGHAM LIFE CARE	R-2	28,000			
BENTLEY CONSTRUCTION	I-2	800			
PHILA SUB. - HUNT COUNTRY	C-5	157			
WOOD PROPERTY (85.9 ACRES - 63 SFD)		14,175	new construction		
WILLOW POND (28 SFD / 15 in Williatown Twp)	R-2	7,700			
RETURNED TO RIDLEY CREEK					
NEW KENT APARTMENTS		76,800			
HERSHEY MILL ESTATES (142 SFD)		39,050			
FAIRWAY VILLAGE (38 SFD)		10,450			
POSSIBLE FUTURE CONNECTIONS IN RIDLEY CREEK BASIN					
(were in the Chester Creek allocations)					
CHARTER CHASE	R-2				26,950
MILL VALLEY	R-2				6,875
MILLSTREAM DRIVE	R-2				6,875
GOSHEN DOWNS (12 SFD)	R-2				3,300
ROCRAY PROPERTY (Hershey Mill Road)	R-2		new construction		7,425
POSSIBLE FUTURE CONNECTIONS IN RIDLEY CREEK BASIN					
PRINS PROPERTY (25 SFD)	R-2		new construction	5,625	
SHERMAN PROPERTY (35 SFD)	R-2		new construction	7,875	
INDIAN HILLS **	R-2				15,050
BROOKMONT/TREMONT **	R-2				15,400
N CHESTER RD MISC (82 SFD - 6 PUT ON LINE IN 1996) **	R-2	1,850			20,900
OLD ORCHARD/RAEWYCK**	R-2				10,150
WILLISTOWN TOWNSHIP					
1 SFD LINE ROAD		275			
TOTALS		438,832	39,275	13,500	197,925
TOTAL ON LINE/COMMITTED/0 - 5 YEARS		491,607			
EXPANSION REQUEST TO		500,000			
REMAINING CAPACITY		8,393			

EXHIBIT 2
EXPANSION TO 0.500 MGD

NEW CONSTRUCTION - BUILT IN LAST 10 YEARS

new residential construction has been calculated at 225 gpd

for single family dwellings and 175 gpd for apartments

ALTERNATIVE #4
PHASE 2
RIDLEY CREEK TREATMENT PLANT
FLOWS
PROPOSED EXPANSION TO 0.750 MGD

May, 1997; revised 9/2/97

file name: Ridley Phase II - .750 MGD

AREA TO BE SERVED	ZONED	GPD ON-LINE	GPD COMMITTED OR SOLD	0 - 5 YEARS	5 YEARS AND BEYOND
BOW TREE FARMS - 338 SFD	R-2	76,050	new construction		
CLOCKTOWER (159 SFD)	R-2	35,775	new construction		
VISTA FARMS - 65 SFD	R-2	17,875			
HUNT COUNTRY - 71 SFD	R-2	19,525			
WENTWORTH - 65 SFD	R-2	17,325			
E.G. ELEMENTARY SCHOOL	R-2	10,000			
PFIZER (formerly SmithKline Beecham)	I-2	10,000	30,000	new construction	85,000
GOSHEN VILLAGE COMMERCIAL	C-5	13,000			
HANCOCK BUILDING (FUCHS)	C-2	3,600			
PHASE II- HANCOCK BLDG			2,400		
PAOLI PIKE (352/PAOLI CORNER) *	C-5	5,950	350		
TAYLOR/HIGHLAND (64 EDU)	R-2	17,600			
SPINOZZI & MCCLOSKEY (10 EDU)	R-2	2,425	225	new construction	
COVENTRY WOODS (18 EDU)	R-2	675	2,925	new construction	
WATERFORD (26 EDU)	R-2	7,150			
MEADOWBROOK/CORNWALLIS AREA (100 EDU)	R-2	19,800	7,700		
BELLINGHAM LIFE CARE	R-2	28,000			
BENTLEY CONSTRUCTION	I-2	900			
PHILA SUB. - HUNT COUNTRY	C-5	157			
WOOD PROPERTY (85.9 ACRES - 63 SFD)		14,175	new construction		
WILLOW POND (28 SFD / 15 in Willistown Twp)	R-2	7,700			
PUMPED FROM CHESTER CREEK BASIN					
MARYDELL - 30 SFD THROUGH PUMP STATION	R-2	8,250			
RETURNED TO RIDLEY CREEK					
NEW KENT APARTMENTS		76,800			
HERSHEY MILL ESTATES (142 SFD)		39,050			
FAIRWAY VILLAGE (38 SFD)		10,450			
POSSIBLE FUTURE CONNECTIONS (were in Chester Creek allocations)					
CHARTER CHASE	R-2				26,950
MILL VALLEY	R-2				6,875
MILLSTREAM DRIVE	R-2				6,875
GOSHEN DOWNS (12 SFD)	R-2				3,300
POSSIBLE FUTURE CONNECTIONS					
INDIAN HILLS **	R-2				15,050
BROOKMONT/TREMONT **	R-2				15,400
N CHESTER RD MISC. (82 SFD---6 SFD ON LINE IN 1998)	R-2	1,650			22,550
OLD ORCHARD/RAEWYCK**	R-2				10,150
PRINS PROPERTY (25 SFD)	R-2		new construction	5,625	
SHERMAN PROPERTY	R-2		new construction	7,875	
WILLISTOWN TOWNSHIP					
BRYN MAWR REHABILITATION					40,000
1 SFD LINE ROAD		275			
CHRIST MEMORIAL LUTHERAN CHURCH					1,000
FOX RIDGE FARMS (22 SFD)					4,950
TOTALS		444,157	43,600	13,500	238,100

TOTAL ON LINE/COMMITTED/0 - 5 YEARS	**501,257**
5 YEARS AND BEYOND	**238,100**
TOTAL CAPACITY NEEDS	**739,357**
EXPANSION REQUEST TO	**750,000**
REMAINING CAPACITY	**10,643**

EXHIBIT 2-A
EXPANSION TO 0.750 MGD

file name: 1996 approved Chester Flows

EXISTING
EAST GOSHEN FLOWS TO WEST GOSHEN

AREA TO BE SERVED	ZONED	GPD ON LINE	COMMITTED IN PROCESS	0-5 YEARS	6 YEARS AND BEYOND
ARDLEIGH ESTATES (8 SFD)	R-2	1,925	275		
BITTERSWEET (49 SFD)	R-2	13,475			
GRAND OAK (141 SFD)	R-2	38,775			
MARYDELL (159 SFD)	R-2	43,725			
MILLCREEK ESTATES(33 SFD)	R-2	9,075			
PIN OAKS (112 SFD)	R-2	30,800			
MISAK DR EXTENSION (8 SFD)	R-2	2,200			
MEADOWS (35 SFD)	R-2	9,625			
ROCKLAND VILLAGE (74 SFD)	R-2	20,350			
SUPPLEE VALLEY (98 SFD)	R-2	26,950			
HICKORY GLEN (9 SFD)	R-2	2,475			
WATERVIEW (66 SFD)	R-2	18,150			
RESERVOIR ROAD (2 SFD)	R-2	825	275		14,575
PRICE PROPERTY (129.6 ACRES)	R-2				35,475
STRASBURG ROAD	R-2	11,825			
ELLIS LANE	R-2	1,100	1,375		
STURBRIDGE	R-2	2,475			
BRANDOLINI/MORSTEIN RD. (9 SFD)	R-3	2,475			
HILLOCH MANOR (7 SFD)	R-2	1,925			
WHITE CHIMNEYS(CHESTER HOLLOW-71 SFD)	R-2	19,525			
WENTWORTH (12 SF)	R-2	3,300			
GOSHEN HEIGHTS (70 SFD)	R-2	19,250			
PARK AVENUE	R-3	9,625			
FIRE HOUSE (13 ACRES)					12,825
FEDOR (175 APTS)	R-4				35,000
TREE TOPS (200 APTS)	R-4	40,000			
HIGHSPIRE (78 TOWNHOUSES)	R-4	17,550			
DUTT'S MILL (33 UNITS & 16 FUTURE)	R-5	7,425	3,375		
GOSHEN VALLEY (656 APTS/TH)	R-5	147,600			
RIDGEWOOD APTS (60 UNITS)	R-5	13,500			
WALNUT HILL ROAD (4 SFD)	R-5	1,100			
AUDUBON (35 TOWNSHOUSE UNITS)	R-5	7,875			
SMITHFIELD APTS. (199 UNITS)	R-5	39,600			
MISCELLANEOUS (7.3 ACRES)	R-5			4,950	
W.C. PIKE (9)	C-1	3,150			
STEEPLECHASE (81 TOWNHOUSES)	C-1	18,225			
ROSE HILL APTS (166 UNITS)	C-4	33,200			
ROSE HILL COMMERCIAL	C-4	8,000			
RACQUET CLUB APTS (71 UNITS)	C-4	14,200			
WATERVIEW APTS (203 UNITS)	C-4	40,600			
COMMERCIAL (13)	C-4	7,000			
W. C. PIKE (12.9 ACRES)	C-4	6,875		7,500	
GOSHEN CORP. PARK*	BP/I-1	30,609	9,391		
GOSHEN OFFICE ASSOCIATES	BP/I-1	3,000			
HICKS ***(GOSHEN CORP PARK WEST)					
93.3 ACRES	I-1	4,913	22,192		
13.5 ACRES (53-3-1.2)COMMONS @ GOSHEN	I-1	4,200			
14.9 ACRES (53-3-1.2B)	I-1			4,544	
11.8 ACRES (53-3-1.7/MILKSTORE)*	BP	573	3,026		
HICKS - BALANCE (34.8 & 36.7 ACRES)	BP				21,807
BRANDYWINE INDUSTRIAL PARK					
MARS*	BP/I-1	13,114			9,386
CALECO*	BP/I-1	616			
(BRANDYWINE PLAZA) WILSON PROPERTY	BP/I-1		10,800		
STS PETER AND PAUL CHURCH	R-2	1,150			
GREEN ACRES (3 SFD)	R-2				825
STRASBURG RD/ROUTE 352 (20 SFD)	R-2				5,500
==========					
PUMPED FROM RIDLEY CREEK					
NEW KENT PUMP STATION					
NEW KENT APARTMENTS (SEE NOTES IN NARRATIVE)	R-5	76,800			
HERSHEY MILL PUMP STATION					
HERSHEY MILL ESTATES (142 SFD)	R-2	39,050			
FAIRWAY VILLAGE (38 SFD)	R-2	10,450			
SHERMAN PROPERTY (35 SFD)	R-2				6,875
PRINS PROPERTY (25 SFD)	R-2				9,625
ROCRAY PROPERTY (33 SFD)	R-2				7,425
ASHBRIDGEPUMP STATION					
ASHBRIDGE/FIRETHORNE (170 SFD)	R-2	46,750			
WYLLPEN (17 SFD)	R-2	550	4,125		
HUNTER'S RUN (8 SFD)	R-2	550	1,650		
WINDERMERE (60 APT.)	R-4	12,000			
FUTURE PUMP STATION(S)					
CHARTER CHASE (98 SFD)	R-2				26,950
MILL VALLEY (25 SFD)	R-2				6,875
MILLSTREAM DRIVE (25 SFD)	R-2				6,875
GOSHEN DOWNS (12 SFD)	R-2				3,300
BRANDOLINI - MORSTEIN RD (27 SFD)	R-2		7,425		
TOTAL		940,074	63,909	16,994	203,418

1996 ACTUAL AVERAGE DAILY FLOW	863,503
PLUS COMMITTED & 0 - 5 YEARS AND BEYOND	284,321
TOTAL ON/LINE AND PROJECTED	1,147,824
ALLOCATED CAPACITY	1,000,000
OVER/UNDER ALLOCATION	-147,824

SFD = 275 GPD
TOWNHOUSE = 225 GPD
APARTMENT = 200 GPD

EXHIBIT 3
APPROVED CHESTER CREEK BASIN FLOWS

NEW CONSTRUCTION = BUILT IN LAST 10 YEARS

new residential construction has been calculated at 225 gpd for single family dwellings and 175 gpd for apartments

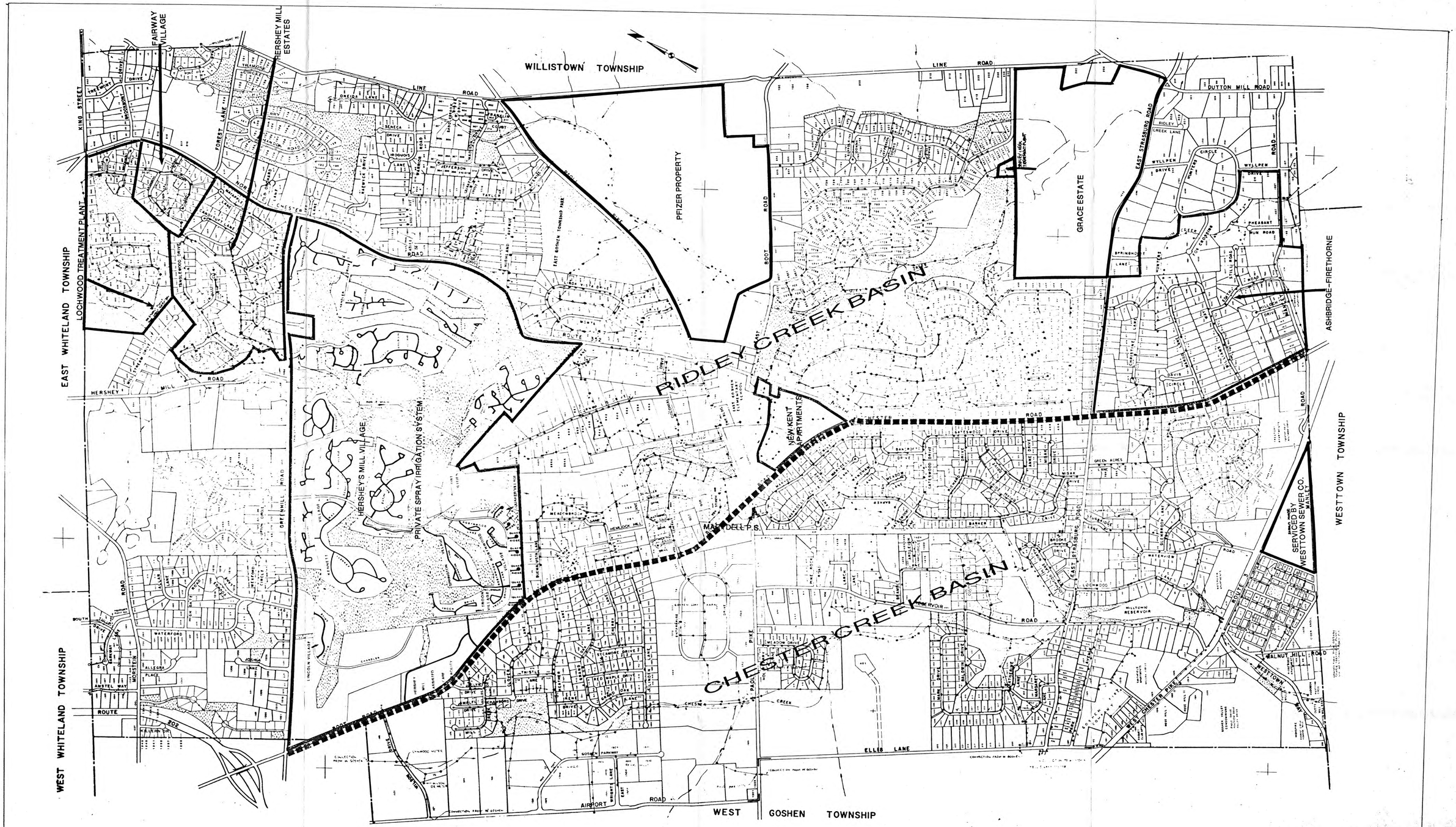
file name:
#2 REV
CHESTER FLOWS

PROPOSED REVISION OF EAST GOSHEN FLOWS TO WEST GOSHEN TREATMENT PLANT

AREA TO BE SERVED	ZONED	GPD ON LINE	GPD COMMITTED OR SOLD	0 - 5 YEARS	5 YEARS AND BEYOND
ARDLEIGH ESTATES (8 SFD)	R-2	1,575	225	new construction	
BITTERSWEET (49 SFD)	R-2	13,475			
GRAND OAK (141 SFD)	R-2	38,775			
MARYDELL (159 SFD - 30 = 129)	R-2	36,475			
MILLCREEK ESTATES(33 SFD)	R-2	9,075			
PIN OAKS (112 SFD)	R-2	30,800			
MISAK DR EXTENSION (8 SFD)	R-2	1,800	new construction		
MEADOWS (35 SFD)	R-2	9,625			
ROCKLAND VILLAGE (74 SFD)	R-2	20,350			
SUPPLEE VALLEY (98 SFD)	R-2	26,950			
HICKORY GLEN (9 SFD)	R-2	2,475			
WATERVIEW (66 SFD)	R-2	18,150			
RESERVOIR ROAD (3 SFD)	R-2	450	225	new construction	2,700
PRICE PROPERTY (129.6 ACRES)	R-2				24,950
STRASBURG ROAD	R-2	11,825			
ELLIS LANE	R-2	1,100	1,375		
STURBRIDGE	R-2	2,475			
BRANDOLINI/MORSTEIN RD. (9 SFD)	R-3	2,025	new construction		
HILLOCH MANOR (7 SFD)	R-2	1,575	new construction		
WHITE CHIMNEYS(CHESTER HOLLOW-71 SFD)	R-2	15,975	new construction		
WENTWORTH (12 SF)	R-2	2,700	new construction		
GOSHEN HEIGHTS (70 SFD)	R-2	19,250			
PARK AVENUE	R-3	9,625			
FIRE HOUSE (13 ACRES)				new construction	4,500
FEDOR (175 APTS)	R-4			new construction	23,625
TREE TOPS (200 APTS)	R-4	35,000	new construction		
HIGHSPIRE (78 TOWNHOUSES)	R-4	17,550			
DUTT'S MILL (33 UNITS & 15 FUTURE)	R-5	7,425	3,375		
GOSHEN VALLEY (656 APTS/TH)	R-5	147,600			
RIDGEWOOD APTS (60 UNITS)	R-5	13,500			
WALNUT HILL ROAD (4 SFD)	R-5	1,100			
AUDUBON (35 TOWNSHOUSE UNITS)	R-5	7,875			
SMITHFIELD APTS. (198 UNITS)	R-5	39,600			
MISCELLANEOUS (7.3 ACRES)	R 5			4,400	new construction
W.C. PIKE (9)	C-1	3,150			
STEEPLECHASE (81 TOWNHOUSES)	C-1	16,200	new construction		
ROSE HILL APTS (166 UNITS)	C-4	33,200			
ROSE HILL COMMERCIAL	C-4	8,000			
RACQUET CLUB APTS (71 UNITS)	C-4	14,200			
WATERVIEW APTS (203 UNITS)	C 4	40,600			
COMMERCIAL ((3)	C-4	7,000			
W. C. PIKE (12.9 ACRES)	C-4	6,875		7,500	
GOSHEN CORP. PARK*	BP/I-1	30,609	9,391		
GOSHEN OFFICE ASSOCIATES	BP/I-1	3,000			
HICKS * **(GOSHEN CORP PARK WEST)					
93.3 ACRES	I-1	4,913	22,192		
13.5 ACRES (53-3-1.2)COMMONS @ GOSHEN	I-1	4,200			
14.9 ACRES (53-3-1.2B)	I-1			4,544	
11.8 ACRES (53-3-1.7/MILKSTORE)*	BP	573	3,026		
HICKS - BALANCE (34.8 & 36.7 ACRES)	BP			21,807	
BRANDYWINE INDUSTRIAL PARK					
MARS*	BP/I-1	13,114		9,386	
CALECO*	BP/I-1	615			
(BRANDYWINE PLAZA) WILSON PROPERTY	BP/I-1		10,800		
STS PETER AND PAUL CHURCH	R-2	1,150			
GREEN ACRES (3 SFD)	R-2			825	
STRASBURG RD/ROUTE 352 (20 SFD)	R-2			5,500	
PUMPED FROM RIDLEY CREEK					
ASHBRIDGEPUMP STATION					
ASHBRIDGE/FIRETHORNE (170 SFD)	R-2	46,750			
WYLLPEN (17 SFD)	R-2	550	4,125		
HUNTER'S RUN (8 SFD)	R-2	550	1,650		
WINDERMERE (60 APT.)	R-4	10,500	new construction		
FUTURE PUMP STATION(S)					
BRANDOLINI - MORSTEIN RD (27 SFD)	R-2	6,075	new construction		
TOTAL		796,999	56,384	53,962	55,775

CAPACITY ALLOCATION AT WGSTP	1,000,000
TOTAL ON-LINE, COMMITTED, 0-5 & BEYOND	(963,120)
REMAINING CAPACITY	36,880

EXHIBIT 3-A
PROPOSED CHESTER CREEK FLOWS



MAP OF
MASTER SEWER PLAN
MADE FOR
EAST GOSHEN TOWNSHIP, CHESTER COUNTY, PENNA.

LEGEND	PROPOSED	EXISTING
SANITARY SEWER		
FORCE MAIN		
PUMP STATION		
SEWAGE TREATMENT PLANT		
SEEPAGE BED		
SANITARY SEWER LATERAL EXTENSION		

SCALE IN FEET
400 0 400 800 1200 1600
REVISED: FEB 1992
OCT 1988

EAST GOSHEN TOWNSHIP
CHESTER COUNTY PENNSYLVANIA

EXHIBIT 4

2/8/96

EAST GOSHEN TOWNSHIP
SEWER SYSTEM
SEWAGE
TREATMENT COST COMPARISON
(per thousand gallons)

CHESTER CREEK	$ 3.31
RIDLEY CREEK	$ 1.67
LOCHWOOD	$ 2.74

Analysis Prepared by
East Goshen Township

EXHIBIT 5

VOLUME II

EAST GOSHEN TOWNSHIP

REVISION TO
OFFICIAL SEWAGE PLAN
ACT 537
FOR
A SPECIAL STUDY AREA

Prepared for

Board of Supervisors
East Goshen Township
Chester County, Pennsylvania

DATE
MAY, 1997
REVISED SEPTEMBER, 1997

Yerkes Associates, Inc.

Consulting Engineers - Land Surveyors
Bryn Mawr, PA *West Chester, PA.*
610-525-6200 *610-644-4254*

Professional Services Since 1874

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6. East Goshen Township Planning Commission Review
7. Evidence of Public Review and Comment
8. Ridley Creek Stream Discharge Analysis
9. June 30, 1995 Approval letter from Department of Environmental Protection
10. "West Goshen Alternative" Correspondence and Calculations
11. Act 537 Special Study Content and Environmental Checklist
12. Westtown Sewer Plant - Daily Local News Article
13. Spray Irrigation Study - taken from 1995 Plan Update
14. 1996 Chapter 94 Report and Analysis of Water Usage for new construction

Volume II

Background and Supporting Documents

A. Plan Summary

This Act 537 Plan Special Study looks at the alternatives available to East Goshen for obtaining the projected additional sewage capacity to serve the ultimate needs of the Township. The Plan recommends that the Ridley Creek Sewage Treatment Plant be expanded, in two phases, from the existing permitted capacity of 0.400 MGD/day to 0.750 MGD.

Phase I - increase to 0.500 MGD
Phase II - increase to 0.750 MGD

The Consulting Engineer believes the first phase can be accomplished at minimal cost and time since most of the existing equipment was originally sized to treat 0.500 MGD.

Some Ridley Creek Watershed flows currently being pumped to the West Goshen Sewage Treatment Plant (WGSTP) would be diverted to the Ridley Creek Sewage Treatment (RCSTP) and some flows from the Chester Creek Watershed would be diverted to the RCSTP. These transfers should eliminate the need for additional discharge capacity at the WGSTP.

The Township has calculated that treatment costs at the RCSTP are more economical than at the WGSTP (see Volume I, Exhibit 5).

The Department's June 30, 1995 approval of the current Sewage Facilities Plan included several recommendations to be addressed prior to the Township submitting a recommendation for a plan to increase the sewage capacity at the RCSTP to serve the Township's ultimate needs. A summary of the actions taken can be found in the Plan Summary, Volume II and again following the letter in Volume II - Section F. - Supporting Documents.

B. Alternatives

For the purposes of this Special Study, four alternatives were studied.

Alternative #1

Obtain additional sewage treatment capacity at the West Goshen Sewage Treatment Plant - The June, 1995 Department approval of the 537 Plan Update recommended that further investigation of the "West Goshen Alternative" would be the preferred way of obtaining additional capacity for East Goshen's ultimate needs.

East Goshen Township Supervisors and Municipal Authority were invited to attend a meeting at the West Goshen Treatment Plant for the purpose of discussing the costs associated with the purchase of an additional 0.200 MGD capacity at the WGTP. In addition to the calculated cost per gallon of $6.00 plus $.50 administrative charge, West Goshen presented an "Analysis of Plant Allocation Costs" to East Goshen. The Analysis determined that East Goshen would have to pay $981,000 for "past due cost" allocations prior to any agreement on the sale of additional capacity.

East Goshen Township Supervisors, Municipal Authority, Authority Consulting Engineer and financial consultant discussed the West Goshen proposal at two joint meetings and determined that the premises upon which the alleged past due costs were determined were inaccurate. They felt that all costs paid over the years to West Goshen were determined by the Agreement signed by both townships in 1977 and since modified periodically by amendments. Based on the advice of its consultants, a letter dated May 9, 1996 was sent to West Goshen advising that East Goshen was interested in discussing purchasing capacity for a proportionate share of the estimated $6.00 per gallon and administrative cost but would not consider paying for any past allocation costs. West Goshen's response of May 10, 1996, confirmed that the previously stated terms were non-negotiable and that West Goshen was only looking for a yes or no answer. East Goshen replied on May 30, 1996 and repeated their willingness to discuss purchasing additional capacity for a proportionate share of the estimated cost per gallon and administrative charge. The Township did not receive a reply to that letter. Copies of all correspondence and documents relating to these discussions has been included with Section F - Supporting Documents.

This Alternative has been eliminated from further consideration.

Alternative #2

Feasibility of obtaining treatment capacity from other sources -

Westtown Sewer Company - Pursuant to a court order, on December 15, 1996 Westtown Township took over the operation of the Westtown Sewage Treatment Plant located on Westtown Road in Westtown Township. The plant has had many problems over the years and been cited by the Department for various violations.

This alternative has been eliminated from further consideration as there are too many unknowns for East Goshen Township and Authority to seek additional discharge capacity at this facility.

A copy of the article from the Daily Local News pertaining to the take-over is included in Section F - Supporting Documents.

West Chester Borough Goose Creek Treatment Plant - The Township was recently asked by the Borough, about any capacity the Township may need at the Goose Creek Treatment Plant. The Township responded with a need for approximately .200 MGD but also determined that there is no economically feasible method of getting any of that sewage to the Goose Creek Plant.

This alternative has been eliminated from further consideration.

Alternative #3

Spray Irrigation

Spray Irrigation was discussed in detail in the June, 1995 act 537 Plan Update and is repeated in Section 13 of the Supporting Documents of this Special Study.

Two parcels were discussed: the Pfizer property (previously owned by SmithKline Beecham) and the Grace Estate. The Pfizer property was dismissed for future spray irrigation purposes due, in part, to the need to pump the treated effluent more than 1 mile.

The Grace Estate, comprising 182 acres, was discussed in more detail. SMC determined that 55.5 acres would be needed for spray fields, in addition to the required buffer and storage pond acreage, to treat 300,000 gpd using a percolation rate of 1.5 inches per week per acre. The total acreage estimated by SMC was 75 acres.

Yerkes Associates concurs with the conclusions set forth in the SMC study. For this Special Study, the amount of acreage that will be required has been calculated based on the need to spray 350,000 gpd. Using the same parameters of 1.5 inches per week per acre, a total of 60.15 acres would be required for spray fields plus the buffer and storage pond needs. The total acreage for spray discharge of 350,000 gpd would be 83.75 acres.

The soils on the Grace Estate are primarily made up of Worsham, Wehadkee, Glenville

and Glenelg. Worsham and Wehadkee soils are poorly drained and generally not suitable for subsurface systems. The Glenville and Glenelg soils are categorized as moderately deep and well drained, making them more suitable. However these soils on the Grace Estate are found in areas where the slope ranges from 3 - 8%. The areas with the higher percentages do not lend themselves to a practical spray irrigation system.

Consequently, it appears that not only is the estimated cost of a spray irrigation system not economically feasible, but also the quality of the land under consideration.

Based on the information available, this alternative has been eliminated from consideration at this time.

Alternative #4

Increase the Ridley Creek Sewage Treatment Plant NPDES Permit (#00505404) to 0.750 MGD

This alternative would be accomplished in two phases. Phase I would expand the capacity to 0.500 MGD which will take care of the existing dwellings that are on-line and the capacity that has been committed or sold. There are no current projections for capacity need in the 0 - 5 years; however there is a projected potential need in the 5 years and beyond range. That is the period of time when the second phase would be considered.

As part of Phase I, the changes shown on Table I would be made in the Ridley Creek and Chester Creek capacity allocations.

The 5 year and beyond projections consist primarily of areas whose on-lot systems are older and have had problems in the past. Any malfunctions found in the walk through completed during the preparation of the existing Act 537 Plan Update have been repaired and are being monitored by the Township's Sewage Management Program.

Allocations for Bryn Mawr Rehab, Christ Memorial Lutheran Church and Fox Ridge Farms, all in Willistown Township, will be placed in the 5 Year and Beyond Range. Methods of getting the sewage to the RCSTP will be the full responsibility of the individual users but must be reviewed and approved by East Goshen Municipal Authority's Consulting Engineer.

Phase II (expansion to .750 MGD) will be designed when the need for public sewers

for any or all of the areas in the 5 Year and Beyond becomes apparent.

Phase II may involve the installation of a new package plant. Sufficient land for the expansion may be available on the current site, however, if it is not, it is assumed that land from the adjacent Township owned open space, could be obtained at a reasonable cost or at no cost.

C. USE OF NEW EDU WASTEWATER RATING

In order to gain the maximum amount of capacity at both the RCSTP and the WGSTP, we have reviewed the actual average daily uses for new construction in both basins. The actual average daily flows from both basins have consistently been 75 - 90 % below the EDU Wastewater Ratings used to develop the capacity allocations (please refer to the Chapter 94 Report).

This Plan proposes to reduce the EDU rating for new construction only from 275 GPD for single family dwellings to 225 GPD; from 225 GPD for townhouses to 175 GPD and from 200 GPD for apartments to 175 GPD.

Table I

Table 1, on the following page, charts the flows that will be transferred to the Ridley Creek Sewage Treatment Plant if and when the permitted capacity at the West Goshen Treatment Plant appears to be in danger of being exceeded. The exception is the flow from New Kent Apartments which is planned for continuing treatment at the RCSTP.

TABLE 1

FLOWS TO BE TRANSFERRED FROM CHESTER CREEK ALLOCATIONS TO RIDLEY CREEK ALLOCATIONS

AREA	GPD	HOME BASIN	CURRENTLY PART OF CHESTER ALLOCATIONS	CURRENTLY PART OF RIDLEY ALLOCATIONS	WILL REMAIN OR BE PUMPED TO
NEW KENT APTS	76,800	RIDLEY	YES		RIDLEY
HERSHEY MILL ESTATES	39,050	RIDLEY	YES		RIDLEY
FAIRWAY VILLAGE	10,450	RIDLEY	YES		RIDLEY
CHARTER CHASE	26,950	RIDLEY	YES		RIDLEY
MILL VALLEY	6,875	RIDLEY	YES		RIDLEY
MILLSTREAM DRIVE	6,875	RIDLEY	YES		RIDLEY
GOSHEN DOWNS (12 SFD)	3,300	RIDLEY	YES		RIDLEY
MARYDELL (30 SFD) PUMP STATION	8,250	CHESTER	YES		RIDLEY

TOTAL 181,250 gallons per day

Table 2 illustrates the estimated sewage needs based on the 5 and 10 year Land Use.

TABLE 2

Estimated Sewage Needs Based on 5 and 10 Year Land Use

Ridley Creek Watershed - There are three undeveloped properties with 35 or more acres

Grace Estate	182 acres	E. Strasburg and Dutton Mill Roads	Recommended for on-lot disposal
Pfizer	300 acres	Paoli Pike	total of 40,000 gpd reserved in RCSTP - balance would be by on-lot disposal
Sherman Property	37.8 acres	N. Chester/Forest Lane	capacity reserved in RCSTP

Chester Creek Watershed - There is one undeveloped property with 35 or more acres - the Price Property at Ellis Lane and Paoli Pike. Capacity is reserved in the Chester Creek allocations for treatment at the West Goshen Treatment Plant.

TABLE 3 - ESTIMATED COST OF ALTERNATIVES AND SPRAY IRRIGATION

Alternative #1 **West Goshen Alternative**	**Alternative #2 Obtain Capacity from Other Sources**	**Alternative #3 Spray Irrigation**	**Alternative #4 Phase I Increase RCSTP Permit to 0.500 MGD**	**Phase II Increase Plant Capacity to 0.750 MGD**
Past Due Allocations $980,000 .200 MGD Capacity $1,300,000 Total Cost $2,228,000	Unknown	Purchase 75 acres @ $89,000/acre $6,675,000 Spray System $150,000 Increased tankage equipment $1,000,000	New Kent Apts $0 Hershey Mill Estates & Fairway Village approx 600 LF Force Main @ $35/LF $21,000 Marydell Pump Station (inst. In shoulder) approx. 500 LF Force Main @$75 $37,500 Modify existing plant equipment $150,000	Increase capacity to 0.750 MGD $1,000,000
$2,228,000	**UNKNOWN**	**$7,825,000**	**$208,500**	**$1,000,000**

D. RECOMMENDED ALTERNATIVE

This Plan recommends Alternative #4 as the plan of choice. Taking the outcome of discussions surrounding Alternative #1 (West Goshen Alternative) and the economics of the other alternatives, including the estimated costs of spray irrigation, it is our opinion that Alternative #4 is the best choice to fill the capacity needs of the Township for the next five years and beyond.

E. IMPLEMENTATION

The goal of this 537 Plan Special Study is to increase the permitted discharge limits of the Ridley Creek Sewage Treatment Plant from 0.400 MGD to 0.750 MGD in two phases. Upon receipt of the Department's approval of this 537 Plan Special Study, NPDES Part I and Part II applications will be submitted to the Department requesting approval of the increase in discharge limits from 0.400 MGD to 0.500 MGD. When the RCSTP flows reach 0.400 MGD, NPDES Part I and Part II applications will be submitted to the Department requesting approval of an increase in the discharge permit limits from 0.500 MGD to 0.750 MGD. If and when it appears that the current capacity limits at the West Goshen Treatment Plant will be exceeded, plans will be prepared to divert the flows from Hershey's Mill Estates, Fairway Village and the Marydell Pump Station from treatment at West Goshen Treatment Plant to treatment at the RCSTP.

The second goal of this submission is to obtain approval for the new wastewater ratings for new construction.

F. SUPPORTING DOCUMENTS

1. Draft Municipal Resolution Adopting Plan
2. Proof of Publication
3. Chester County Health Department Review and Township Response
4. Chester County Planning Commission Review and Township Response
5. East Goshen Township Municipal Authority Review
6. East Goshen Township Planning Commission Review
7. Evidence of Public Review and Comment
8. Ridley Creek Stream Discharge Analysis
9. June 30, 1995 Approval Letter from Department of Environmental Protection
10. "West Goshen Alternative" correspondence and Calculations
11. Act 537 Special Study Content and Environmental Checklist
12. Westtown Sewer Plant - Daily Local News Article
13. Spray Irrigation Study completed in 1995

14. 1996 Chapter 94 Report for Ridley Creek Sewage Treatment Plant and Analysis of Water Usage for New Construction

SUPPORTING DOCUMENTS

DRAFT
RESOLUTION FOR PLAN REVISION

RESOLUTION NO. _____

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 Resources (Department) 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, the Board of Supervisors of East Goshen Township has adopted a 537 Plan Update approved by the Pennsylvania Department of Environmental Protection in June, 1995, and

WHEREAS, the municipality has now prepared a Special Study to determine the best alternative for obtaining additional sewage capacity projected to serve the ultimate needs of the municipality, and

WHEREAS, the Special Study considered three alternatives to accomplish the acquisition of the projected needed sewage capacity, and

WHEREAS, the recommended alternative determined through this Special Study is to use two phases to increase the discharge permit limits of the Ridley Creek Sewage Treatment Plant (PA NPDES # 0050504) from the existing permit limit of 0.400 MGD to 0.750 MGD, and

WHEREAS, the Plan proposes to reduce the wastewater ratings per equivalent dwelling unit for new construction only,

AND NOW THEREFORE, be it resolved that the Act 537 Special Study for East Goshen Township dated May, 1997 and prepared by Yerkes Associates, Inc. is hereby approved and adopted on this _____day of _____, 1997.

BOARD OF SUPERVISORS

_____
E. Martin Shane, Chairman

_____ATTEST

_____
Joseph M. McDonough, V. Chairman

_____
John Chatley III, Member

_____
Mary L. Powell, Member

_____
Carmen Battavio, Member

SUPPORTING DOCUMENTS

Proof of Publication of Notice in Daily Local News

Under Newspaper Advertising Act No. 587, Approved May 16, 1929

State of Pennsylvania
County of Chester } ss: { No. _____ Term, 19_____

Debra S. Wood, Legal Advertising Rep of the Daily Local News Company, a corporation, of the County and state aforesaid, being duly affirmed, deposes and says that the Daily Local News, a newspaper of general circulation, published at 250 N. Bradford Ave., West Chester, Pa., County and State aforesaid, was established November 19, 1872, and Incorporated December 11, 1911, since which date the Daily Local News has been regularly issued in said county, and that the printed notice or publication attached hereto is exactly the same as printed and published in the regular editions and issues of the said Daily Local News on the following dates viz

May 30 A.D. 19 97

Affiant further deposes that he/she is the proper person duly authorized by the Daily Local News Company, a corporation, publishers of said Daily Local News, a newspaper of general circulation, to verify the foregoing statement under oath, and that affiant is not interested in the subject matter of the aforesaid notice or advertisement, and that all allegations in the foregoing statements as to time, place and character of publication are true.

Debra S. Wood

affirmed to and subscribed before me this 30th
day of May 19 97

Virginia Martini
Notary Public

Notarial Seal
Virginia Martini, Notary Public
East Bradford Twp., Chester County
My Commission Expires Oct. 18, 1997

My Commission Expires:

COPY OF NOTICE OR PUBLICATION

NOTICE — The East Goshen Township Board of Supervisors is considering adoption of a Resolution which would approve the submission of an Act 537 Plan Revision of a Special Study Area for the purpose of requesting an increase of the NPDES PA Permit 0050504 discharge limits from 0.400 MGD to 0.750 MGD and to reduce the wastewater ratings for new construction. The Public comment period for this Plan will commence on June 1, 1997 and end on July 1, 1997. Copies of the Special Study are available at the East Goshen Township Building, 1580 Paoli Pike, West Chester, PA 19380, Monday-Friday, from 8:00 a.m. to 4:30 p.m.

East Goshen Township-
Louis F. Smith, Jr.
Manager

Statement of Advertising Costs

East Goshen Township
1580 Paoli Pike
West Chester, PA 19380

To DAILY LOCAL NEWS COMPANY, Dr.

For publishing the notice or publication attached hereto on the above stated dates ..... $ _____

Probating same ..... $ _____

Total ..... $ _____

Publisher's Receipt for Advertising Costs

The Daily Local News Company, a corporation, publishers of the Daily Local News, a newspaper of general circulation, hereby acknowledges receipt of the aforesaid notice and publication costs and certifies that the same has been duly paid.

DAILY LOCAL NEWS, a Corporation,
Publishers of DAILY LOCAL NEWS, a newspaper
of General Circulation.

By _____

SUPPORTING DOCUMENTS

THE COUNTY OF CHESTER

COMMISSIONERS:
Karen L. Martynick, Chairman
Colin A. Hanna
Andrew E. Dinniman

CHESTER COUNTY HEALTH DEPARTMENT
Government Services Center
601 Westtown Road, Suite 295
West Chester, PA 19382-4543
FAX: (610) 344-5934

Sewage/Wells (610) 344-6526
Food/Vector (610) 344-6689
Laboratory (610) 344-6439

Certified Food Mgr./Public Water (610) 344-5938
Solid Waste Mgt./Recycling (610) 344-5937
Weights & Measures/Consumer Affairs (610) 344-6150

July 21, 1997

Louis F. Smith, Jr.
Township Manager
East Goshen Township
1580 Paoli Pike
West Chester, PA 19380-6199

RE
JUL 2 3 1997
YERKES ASSO

RE: East Goshen Township 537 Plan

Dear Rick:

As requested, the Chester County Health Department has reviewed the "East Goshen Township Revision to the Official Plan Act 537 for a Special Study Area" (plan) as prepared by Yerkes Associates, Inc and dated May, 1997.

The plan proposes to increase the capacity of the East Goshen Township Ridley Creek sewage treatment plant from .4MGD to .75MGD. The expansion will occur in two phases. The first phase will rerate the plant to .5MGD and the second phase will expand it to .75MGD. The plan also proposes to revise the design flow figures from new construction.

The following comments are offered:

1. There is no supporting documentation to justify the use of the revised flows for new construction. The supporting documentation should be included in the report.

2. This Department will not object to the re-rate of the existing plant to .5MGD. The Township should be aware that Ridley Creek is a high quality stream and, as such, the Department of Environmental Protection ragulations require that a social and economic justification be provided for any new or increased discharge. No justification has been provida in the plan.

3. Regarding the sewage treatment plant expansion to .75MGD; DEP will again require that a social and economic justification be submitted. Additionally, this Department recommends that the township re-evaluate the need for the expansion when growth in the township warrants the increase.

This Department generally supports the recommendations contained in the plan but believe addition documentation to support the chosen alternatives are necessary.

Should you have any questions concerning this review please contact me at 344-6239 or the above address.

Sincerely,

Maria

Maria T. Goman
Environmental Health Supervisor

cc: Yerkes Associates, Inc.
Pennsylvania Department of Environmental Protection
Chester County Planning Commission
file

Yerkes

Yerkes Associates, Inc. Consulting Engineers / Landscape Architects / Surveyors

September 9, 1997

Maria Goman, Environmental Health Supervisor
Chester County Health Department
Government Service Center
601 Westtown Road, Suite 295
West Chester, PA 19382-4543

Re: East Goshen Township
Act 537 Plan, Special Study
CCHD Review of July 21, 1997

Dear Maria:

We are in receipt of your July 21, 1997 review of the May, 1997 draft of the Act 537 Sewage Facilities Special Study Plan for East Goshen Township. We offer the following responses:

1. COMMENT: There is no supporting documentation to justify the use of the revised flows for new construction. The supporting documentation should be included in the report.

   The 1996 Chapter 94 report for the Ridley Creek Plant is included as Addendum #1. Page 1 of this report showed that the volume of the system in 1996 indicated a usage of 205 gpd per connection. There have been 44 new single family homes constructed and occupied in the township in the past five years. An analysis was made of the actual water usage of these homes with a resulting average usage of 211 gpd. All of the homes used in the analysis are 3,000 + square feet. A copy of the analysis results is included in this addendum.

2. COMMENT: This Department will not object to the re-rating of the existing plant to 0.500 MGD. The Township should be aware that Ridley Creek is a high quality stream and, as such, the Department of Environmental Protection regulations require that a socio-economic justification be provided for any new or increased discharge. No justification has been provided in the plan.

Glen Stinson of the regional office of DEP has advised that preliminary treatment requirements for the Ridley Creek Sewage Treatment Plant. have been ordered in-house. Mr. Stinson said that DEP will advise East Goshen if a socio-economic justification will be required.

3. COMMENT: Regarding the sewage treatment plant expansion to .75 MGD, DEP will again require that a social and economic justification will be submitted. Additionally, this Department recommends that the township re-evaluate the need for the expansion when growth in the township warrants the increase.

   See answer to Comment #2 with regard to the need for a socio-economic justification. The August, 1997 revision of the plan explains the need to expand to 0.750 MGD in more detail.

We trust we have satisfactorily responded to your concerns. Please contact me if you have any questions or additional comments.

Very truly yours,

Suzanne K. Fish

Suzanne K. Fish
Project Manager

SKF
enclosures
cc: Louis F. Smith, Jr. , Township Manager

SUPPORTING DOCUMENTS

THE COUNTY OF CHESTER

COMMISSIONERS:
Karen L. Martynick, Chairman
Colin A. Hanna
Andrew E. Dinniman

WILLIAM H. FULTON, AICP
Executive Director

PLANNING COMMISSION
Government Services Center, Suite 270
601 Westtown Road
West Chester, PA 19382-4539
(610) 344-6285
FAX: (610) 344-6515

July 29, 1997

JUL 31 1997
YERKES ASSOCIATES INC.

E. Martin Shane, Chairman
East Goshen Township Board of Supervisors
1580 Paoli Pike
West Chester, PA 19380

Re: Revision to Official Sewage Plan - Act 537 for a Special Study Area

Dear Mr. Shane:

The Chester County Planning Commission (CCPC) has reviewed the Plan Revision dated May 1997, as required by Section 71.53(a)(2) of the Pennsylvania Sewage Facilities Act (Act 537). One of the purposes of our review is to highlight issues we believe the PA Department of Environmental Protection (DEP) will raise in their review. We suggest that approval of your plan will be facilitated if our comments are addressed in writing by the Township and included with the document when it is sent to DEP for their review and action.

Recently CCPC sent to the Township a memorandum containing our Final Consistency Review Report and Summary of Findings related to the County Vision Partnership Program. In that memorandum we stated that there are no major areas of inconsistency between the current Township Sewage Facilities Plan and the landscape designations contained in the Chester County Comprehensive Policy Plan Element ***Landscapes***. We realize that as primarily a suburban landscape, the Township will eventually need additional infrastructure capacity to meet future needs. The proposed re-rating of the sewage treatment plant from 0.4 to 0.5 million gallons per day (mgd) may be necessary to meet immediate and short term needs. However, the Plan Revision document submitted for our review does not appear to clearly document the need to expand the capacity to 0.750 mgd.

The first objective stated for the Plan Revision contained in the Executive Summary is to obtain approval to reduce the current wastewater ratings. However, little information is presented in the document to support the proposal to reduce equivalent dwelling (EDU) flows by the type of housing unit. We believe DEP will want to see more detailed information to consider approving the proposed EDU ratings.

The second stated objective of the Plan Revision is to obtain approval to increase the discharge permit limits of the Ridley Creek Sewage Treatment Plant from 0.400 million gallons per day (mgd) to 0.750 mgd. We find that the document only partially supports your objective for the following reasons:

- There is no specific mention of any previous wastewater facilities planning efforts.
- There are no maps or other graphics to clearly show the division of sewage flows in the two watersheds.
- A copy of the 1996 Chapter 94 Report would help support other information contained in the document.

We offer the following additional comments about the information contained in the document:

- On page 3 it is stated that the total Ridley Creek Watershed basin flow is 392,000 gallons per day (gpd). This information is not consistent the document Exhibits and conflicts with the table on page 4 that indicates the basin flow to be 408,182 gpd.
- The table on page 4 also indicates that there is 80,000 gpd of needs in this watershed within the next 5 years and 166,050 gpd beyond the next 5 years. This information appears to be different from that contained in the document Exhibits.
- For the Chester Creek Basin, the table on page 4 indicates that 87,725 gpd will be needed beyond the next 5 years. This information appears to be different from data contained in the document Exhibits.
- On page 4 it is stated the flows from the New Kent Apartments are currently being treated at the Ridley Creek STP. This flow is not included in Exhibit 1.

A major omission from the proposed Act 537 Plan Revision is any mention of the fact that the entire Ridley Creek Watershed in East Goshen Township is designated by the Commonwealth of Pennsylvania as High Quality Waters. This water quality designation has special implications for new or increased discharges to the Waters of the Commonwealth. The Act 537 Plan adopted by the Township in 1992 recognized the need to conduct a socio-economic study to justify the proposed increase in discharge to the Ridley Creek. To the best of our knowledge, this is still a PADEP requirement for proposed discharges to High Quality Waters.

CCPC is concerned that the Township still has not given the spray irrigation (land application) alternative a thorough analysis. Land application is the primary alternative emphasized by DEP for proposed discharges to High Quality Waters. We do agree that this alternative would be more expensive than other alternatives if the Township were to purchase in fee simple land that would be used only for that purpose. The County Planning Commission recommends that the Township investigate other possibilities for the land application of effluent, including long term lease arrangements at suitable sites and/or combining land application with other uses of existing and proposed municipal open space sites.

CCPC is very concerned that the Township, the Municipal Authority and DEP have approved or committed sewage treatment plant capacity to proposed land developments over and above the capacity currently available to the Township. We suggest there is a need to institutionalize plan approval procedures between the Township and its Authority to prevent this from happening in the future.

Please contact me if you have any questions regarding this review. If the Township makes significant changes to the Plan Revision document, please send us a copy for our files.

Sincerely,

William H. Fulton, AICP
Secretary

WHF/REI/kp
cc: Glen Stinson, PADEP
Maria Goman, Chester County Health Department
Louis F. Smith, Jr., Township Manager
David Linahan, P.E., Yerkes Associates, Inc.

Yerkes

Yerkes Associates, Inc. Consulting Engineers / Landscape Architects / Surveyors

September 9, 1997

William H. Fulton, AICP
Attn: Robert Ihlein
Chester County Planning Commission
Government Services Center
601 Westtown Road, Suite 270
West Chester, PA 19382-4539

Re: East Goshen Township
Act 537 Plan Special Study

Dear Mr. Ihlein:

We are in receipt of the July 29, 1997 review of the May, 1997 draft of the Special Study referenced above. The following responses are offered to your comments:

1. COMMENT: The proposed re-rating of the sewage plant from 0.4 to 0.5 million gallons per day (mgd) may be necessary to meet immediate and short term needs. However, the Plan Revision document submitted for our review does not appear to clearly document the need to expand the capacity to 0.750 MGD.

   Addendum #3 addresses the estimated needs leading to the expansion to .0750 MGD.

2. COMMENT: However, little information is presented in the document to support the proposal to reduce equivalent dwelling (EDU) flows by the type of housing unit. We believe DEP will want to seen more detailed information to consider approving the proposed EDU ratings.

   The 1996 Chapter 94 report for the Ridley Creek Plant is included as Addendum #1. Page 1 of this report showed that the volume of the system indicated a usage of 205 gpd per connection. In addition, an analysis was made of the actual water usage of 44 single family dwellings built within the past five years. The results of this analysis

show that the average usage is 211 gpd. All of the homes used in the analysis are 3,000 + square feet in size. A copy of the analysis can be found in this Addendum.

3. COMMENT: There is no specific mention of any previous wastewater facilities planning efforts.

   Volume I, page 2, refers to the current township sewage facilities plan that was approved as an update in June, 1995. The reference has been elaborated on so that it stands out more.

4. COMMENT: There are no maps or graphics to clearly show the division of sewage flows in the two watersheds.

   Exhibit 4 has been revised to show individual lots more clearly, where those lots are treated or whether they have on-lot disposal systems.

5. COMMENT: Paragraph, page 2....several comments regarding discrepancies between chart numbers and text language.

   Revisions have been made to the document to correct these discrepancies.

6. COMMENT: Page 2, second paragraph regarding the High Quality Waters classification of the Ridley Creek and the need to conduct a socio-economic study to justify the proposed increase to the Ridley Creek. Chester County Planning Department feels this is a PaDEP requirement for proposed discharges to High Quality Waters.

   The Department has advised me that preliminary treatment requirements for the proposed expansion have been ordered. The Department will review those requirements and advised the Township if a Socio-Economic Justification should be prepared.

7. COMMENT: Page 2, third paragraph, referencing CCPC concerns regarding spray irrigation.....

The revised document addresses this concern.

8. COMMENT: Page 2, fourth paragraph. Regarding the County's concerns regarding the Township, Municipal Authority and DEP having approved or committed sewage treatment capacity to proposed land developments over and above the capacity currently available to the Township.

   The Township and Municipal Authority keep very detailed records regarding actual flow and committed capacity and the resulting available capacity. The "paper" flows shown on Exhibits 1 - Existing Ridley Creek Treatment Plant Allocations and Exhibit 3 - Existing Conveyance to West Goshen Treatment Plant, are in compliance with available capacity. As part of the 537 Sewage Facilities Planning to serve the ultimate needs of the Township, allocation modifications and additional capacity will be needed.

Please contact me if you have any questions or additional comments.

Very truly yours,

Suzanne K. Fish

Suzanne K. Fish
Project Manager

skf
cc: Louis F. Smith, Jr.; East Goshen Township

SUPPORTING DOCUMENTS

AREA CODE 610
692-7171

EAST GOSHEN MUNICIPAL AUTHORITY
EAST GOSHEN TOWNSHIP
1580 PAOLI PIKE, WEST CHESTER, PA 19380-6199

July 15, 1997

Board of Supervisors
East Goshen Township
1580 Paoli Pike
West Chester, PA 19380

Re: Revision to Official Sewage Plan
Act 537 For A Special Study Area

Dear Board Members:

At their meeting on Monday, July 14, 1997 the Municipal Authority reviewed the Revision to the Official Sewage Plan Act 537 for A Special Study, Volumes I and II and have the following comments:

1) On page 3, Volume I, paragraph 5, the flow numbers should be provided so that the Ridley Creek Balance can be calculated.

2) On page 4 in both Volumes I and II, the wording should be changed from "75-90% **below** the EDU Wastewater Ratings" to "75-90% **of** the EDU Wastewater Ratings".

3) On page 5, Volume I, the date in paragraph 1 should be "Spring, 1996".

4) On page 7, Volume I, paragraph 3, the proposal for construction of 500 feet of force main to divert 8,250 gallons from the Chester Creek Marydell Pump Station to the Ridley Creek system should be reviewed for cost effectiveness.

5) On page 9, Volume I, "$55 per acre" should be changed to "$55,000 per acre".

Very truly yours,

Marie D. Clevenger

Marie D. Clevenger
Director, Utility Administration

mdc

SUPPORTING DOCUMENTS

AREA CODE 215
692-7171

EAST GOSHEN TOWNSHIP
PLANNING COMMISSION
1580 PAOLI PIKE, WEST CHESTER, PA. - 19380

July 11, 1997

Board of Supervisors
East Goshen Township
1580 Paoli Pike
West Chester, PA 19380

RE: Revision to Official Sewage Plan - Act 537
Planning Commission Review

Dear Board Members:

At their meeting on July 2, 1997, the Planning Commission reviewed the "Revision to Official Sewage Plan - Act 537" prepared by Yerkes Associates, Inc. After a discussion and explanation period the consensus of the members was that they (the Planning Commission) did not have any significant comments or revisions to make to the proposed plan.

Very truly yours,

Jo Ann Kelton
Chairman

SUPPORTING DOCUMENTS

AREA CODE 610
692-7171

BOARD OF SUPERVISORS
EAST GOSHEN TOWNSHIP

CHESTER COUNTY
1580 PAOLI PIKE, WEST CHESTER, PA 19380-6199

July 21, 1997

Department of Environmental Protection
Southeast Regional Office
Lee Park, Suite 6010
555 North Lane
Conshocken, PA 19428

Re: East Goshen Township 537 Plan Revision

To Whom it May Concern:

Please be advised the Township has not received any public comments, written or verbal, as of this date.

Sincerely,

Louis F. Smith, Jr.
Township Manager

\RICK\SEWERS\RCSTP

SUPPORTING DOCUMENTS

TMH
ENVIRONMENTAL SERVICES, INC.

P.O. Box 439
Thorndale, PA 19372
(610) 380-8680 • Fax (610) 380-8786

Memo
LETTER

To Ms. Sue Fish
Yerkes Associates
1444 Phoenixville Pike
West Chester, PA 19380

Date 6 December 1996

Subject East Goshen Twp.
Ridley Creek WWTF
Sampling Analyses

Dear Sue:

Enclosed please find the results of the sampling you requested from Ridley Creek at the outfall of the Ridley Creek WWTF discharge.

Should you have any questions, please do not hesitate to contact Tom Hauser or myself.

RECEIVED
DEC 1 0 1996
YERKES ASSOCIATES, INC

Sincerely

SIGNED Tom Hauser

☐ Please reply ☐ No reply necessary

CEDAR GROVE ENVIRONMENTAL, INC.
Analytical Laboratories and Consultants
100 Gallagherville Road • Downingtown, PA 19335-3698
(610) 269-6977 • Fax (610) 269-6965
E-mail: office@cgelab.com

Customer: TMH ENV SERV RIDLEY CREEK
ATT: TOM HORREX
P O BOX 439
THORNDALE PA 19372

Customer Summary Report

Start Date: 11/21/96 Ending Date: 11/21/96 Report Date 12/03/96

Customer Summary Report

DATE	SAMPLE	SAMPLE SOURCE (Test Performed)	(Method)	(Results)
11/21/96	**9609626 Below Mixing Zone - Ridley Creek**			
		Ammonia/as N	EPA 350.3	< 0.1 mg/l
		Carbonaceous BOD	SM 16: 507	1 mg/l
		Fecal Coliform	Membrane Filtration	100/100 mls
		Solids/Residue, Suspended	EPA 160.2 non-filterable	< 5 mg/l
11/21/96	**9609627 400' Upstream/Below next Trib. - Ridley Creek**			
		Ammonia/as N	EPA 350.3	< 0.1 mg/l
		Carbonaceous BOD	SM 16: 507	1 mg/l
		Fecal Coliform	Membrane Filtration	110/100 mls
		Solids/Residue, Suspended	EPA 160.2 non-filterable	< 5 mg/l
11/21/96	**9609628 Outfall - Ridley Creek**			
		Ammonia/as N	EPA 350.3	0.1 mg/l
		Carbonaceous BOD	SM 16: 507	2 mg/l
		Fecal Coliform	Membrane Filtration	200/100 mls
		Solids/Residue, Suspended	EPA 160.2 non-filterable	14 mg/l
11/21/96	**9609629 Point of Outfall U.S. - Ridley Creek**			
		Ammonia/as N	EPA 350.3	< 0.1 mg/l
		Carbonaceous BOD	SM 16: 507	1 mg/l
		Fecal Coliform	Membrane Filtration	40/100 mls
		Solids/Residue, Suspended	EPA 160.2 non-filterable	< 5 mg/l

SUPPORTING DOCUMENTS

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES

Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428

Southeast Regional Office

(610) 832-6130
FAX: (610) 832-6259

JUN 30 1995

RECEIVED
JUN 30 1995

Louis Smith
East Goshen Township
1580 Paoli Pike
West Chester, PA 19380

Re: Act 537 Plan Update
East Goshen Township
Chester County

Dear Mr. Smith:

We have completed our review of your municipality's updated official sewage facilities plan entitled East Goshen Township Act 537 Plan Update as prepared by SMC Environmental Services Group, dated December 1992, Revised June 1994. The review was conducted in accordance with the provisions of the Pennsylvania Sewage Facilities Act.

Approval of the plan is hereby granted.

1. Implementation of the on-lot and community sewage system management program

2. Diversion of sewages flows for New Kent Apartments from the Ridley Creek sewage treatment plant to the West Goshen sewage treatment plant.

3. Immediate initiation of further planning in conjunction with West Goshen for the "West Goshen Alternative". A plan of study must be submitted that outlines the study area and proposed plan content and that includes a Task Activity Report or equivalent cost document.

4. Initiation of further planning to evaluate the need for the proposed Line Road Interceptor. A plan of study must be submitted that outlines the study area and proposed plan content and that includes a Task Activity Report or equivalent cost document.

5. Initiation of further planning to evaluate the possible connection of the Bryn Mawr Rehabilitation Hospital tot he Ridley Creek sewage treatment plant. A plan of study must be submitted that outlines the study area and proposed plan content and that includes an Task Activity Report or equivalent cost document.

6. Utilization of new EDU wastewater ratings:

Single family detached dwellings	- 275 gpd
Townshouses	- 225 gpd
Apartments	- 200 gpd

7. Initiation of further planning to further evaluate other alternatives if the "West Goshen Alternative" does not meet East Goshen Township needs. The spray irrigation alternative would have to be evaluated in more detail. A plan of study must be submitted that outlines the study area and proposed plan content and that includes a Task Activity Report or equivalent cost document.

If you have any questions regarding this matter, please feel free to contact me at the above number.

Sincerely,

Joseph A. Feola

Joseph A. Feola
Water Management Program Manager

cc: Chester County Health Department
Chester County Planning Commission
Planning Section
West Goshen Township
SMC Environmental Services Group
Division of Municipal Facilities and Grants
Re 30 (RN)153

ANSWERS TO THE JUNE 30, 1995 LETTER FROM THE DEPARTMENT

1. The Township's On-Lot Management Plan was implemented in July, 1994.
2. The diversion of flows for New Kent Apartments from the Ridley Creek to the Chester Creek has not been done.
3. The "West Goshen Alternative" has been studied and found not to be economically feasible.
4. The proposed "Line Road Interceptor" has been installed by a developer.
5. The new EDU wastewater readings are being used.
6. Studies of alternatives other than the "West Goshen Alternative" have been completed.

SUPPORTING DOCUMENTS

as of 2/76

West Goshen Sewer Authority
Analysis of Plant Capacity Allocation Costs

The objective of this analysis is to compare the value of the investments made by West Goshen (the Principal), and East Goshen, West Whiteland, and Westtown (the Investors) to guarantee treatment capacity provided by the West Goshen Sewage Treatment Plant (the Plant) with actual capacity allocated. The capacity allocations are based on agreements between the Investors and the Principal. The value of the investments made by the Investors is based on a financial analysis of historic payments and future payment obligations. The value of the investments made by the Principal is based on the original cost of the various plant assets.

The comparison is based on current investment values. The investments have been made over a 32 year period. It is therefore necessary to convert the historic investment dollars to current dollars. This has been done using construction cost indices published by Engineering News Record (ENR). The cost of the plant assets are multiplied by the appropriate index to achieve current value measurements.

In order to determine the current value of the Investors' contributions, it is first necessary to determine the original values of the payment obligations. Rather than pay a lump sum for future capacity, the Investors have been making semi-annual payments to the Principal. A series of payments can be translated into a lump sum value through a financial process called "discounting". This process provides a "present value" measurement as of the date of the first payment. Once computed, each value is converted to a current value by applying the appropriate ENR cost index.

Exhibit I, the Historic Plant Cost Schedule, presents a listing of the plant assets along with the year acquired and the original cost. The schedule then shows the conversion of the historic amounts to a current dollar basis. The original cost basis of $3.4million converts to $11.3million. Over 82% of this difference, $6.5 million, is attributed to the conversion of the initial cost of the plant in 1963. The cost index of 6.028 reflects the current value of a dollar spent in 1963.

Exhibit II, the Contribution Analysis, presents the discounted "present" value of each investment made by the Investors, with the term present value representing the value of the payment stream at the date presented in the Initial Year column. These present values have been converted to a current cost value based on the scheduled cost index. The West Whiteland Township and Westtown Township payments have been constant semi-annual amounts and have therefore been valued as annuities using standard financial annuity computations. The payments made by East Goshen have not been constant amounts. These payments have been valued through a discounting model presented as Exhibits III and IV. This model discounts each payment separately and then adds the results to achieve a single value measurement.

The results of the analysis carry forward to Exhibit V, the Sewer Plant Investment Allocation Analysis. The first column presents the allocated capacity stated as gallons per day. The second column restates these capacity allocations in terms of percentages to total capacity. The current investment total of $11.3million has been brought forward from the Historic Plant Cost schedule and represents the total current value of the plant. The Investors' "Current Investment" amounts are those values computed in the Contribution Analysis schedule. The difference of $8.04million is the residual current value attributed to West Goshen. The Allocated Investment amounts are computed by multiplying the total current investment value by the percent capacity and the difference is derived by subtracting the allocated investment from the current investment.

The results indicate that the current value of the investments made by each party do not reflect the actual capacity allocated. One of the investors, Westtown, has slightly overpaid for its allocation. East Goshen and West Whiteland Townships have received a capacity allocation greater than their current investment value. West Goshen Township has subsidized East Goshen and West Whiteland Townships' allocations. If the grants for the original plant construction in 1963 and the expansion completed in 1980 were included as investment by West Goshen, the current plant value would be almost double its current value. Therefore, all the municipalities are sharing in the benefits of West Goshen obtaining these grants.

Exhibit

GLACE ASSOCIATES, INC.

CONSULTING ENGINEERS
3705 Trindle Road
Camp Hill, PA 17011

717-731-1579 • FAX 717-731-1348

FAX TRANSMISSION COVER LETTER

TO: RICK SMITH, EAST GOSHEN TOWNSHIP

FROM: MAX E. STONER

REFERENCE: REVISED ANALYSIS OF PLANT CAPACITY ALLOCATION COSTS, AS REQUESTED.

DATE: 5/10/ 11:30

NUMBER OF PAGE, INCLUI

PLEASE (

TOTAL NUMBER OF GIBLE

CONFIDENTIALITY NOTICE: This facsimile contains confidential information which may also be legally privileged and which is intended only for the use of the addressee(s) named above. If you are not the intended recipient, or the employee or agent responsible for delivering it to the intended recipient, you are hereby notified that any dissemination or copying of this facsimile, or the taking of any action in reliance on the contents of this transmittal, may be strictly prohibited. If you have received this facsimile in error, please notify us immediately by telephone and return the entire facsimile to us at the above address at our cost via the U.S. Postal Service. Thank you!

Original will ____ will not ✓ follow by mail.

ADJUSTED FOR DEPRECIATION

AND PAYMENTS VALUATION

Exhibit I

West Goshen Sewer Authority
Historic Plant Cost Schedule
Indexed to June 1995

Cost Item:	Year Acq.	Original Cost Basis	Cost Index	Indexed Cost Basis
Initial cost (net)	1963	~~$ 1,293,924~~ $ 783,127	6.028	~~$ 7,828,570~~ $ 4,720,690
Additional costs				
Garage storage	1967	$ 24,568	5.057	$ 124,754
Gas detection	1968	$ 9,884	4.703	$ 46,481
Plant upgrade	1980	$ 1,793,032	1.678	$ 3,008,532
Digester roof	1983	$ 172,733	1.336	$ 230,745
Roof replacement	1985	$ 32,670	1.295	$ 42,300
Addtl. land purchase	1990	$ 24,538	1.148	$ 28,166
Belt filter	1991	$ 0	0	$ 0
Covers	1993	$ 0	0	$ 0
Admin/garage	1993	$ 0	0	$ 0
Grit/scum removal	1994	$ 0	0	$ 0
Total costs		$ 3,356,149		$ ~~11,309,648~~ ← $ 8,201,768

Notes:

1) An economic development grant (PL660) in the amount of $212,137 has not been included in the capital costs of the original treatment facility. If the grant were included in the original capital cost based on the construction cost index, the additional current capital costs would be $1,278,762.

2) An EPA grant in the amount of $4,603,264 has not been included in the original capital cost. Based on the construction cost index, the additional current capital costs would be $7,724,277.

3) Computational differences result because more significant figures than are presented in the cost index were actually used.

Exhibit II

West Goshen Sewer Authority
Contribution Analysis

	Initial Year	Term Years	Discount Rate	Annual Payment	Present Value	Cost Index	Current Cost Value	
						2.684		
East Goshen Payment I	1977	25	5.56%	Various	$ 296,629	~~2.109~~	~~$ 625,448~~	796,1
East Goshen Payment II	1978	30	5.90%	Various	$ 463,527	~~1.957~~	~~$ 906,942~~	1,282
West Whiteland Township	1985	30	9.18%	$ 64,710.00	$ 657,180	1.295	$ 850,895	2,078
Westtown Township	1979	30	6.39%	$ 37,000.00	$ 491,293	1.809	$ 888,606	
						2.766		

East Goshen Payment I - Payment amounts made towards the costs of the original plant have varied from 1977 through 1980 and have been constant at $20,472 per year in semi-annual payments of $10,236.

East Goshen Payment II - These payments varied with the amortization schedule of debt payments for West Goshen. The payments were adjusted for refinancings of the debt in 1985 and again in 1991.

Westtown Township - These payments have been consistent since 1979 - $37,000 per year in semi-annual payments of $18,500.

West Whiteland Township - These payments have been consistent since 1985 at $90,000 per year in semi-annual payments of $45,000. Only $64,710 per year is actually attributed towards the sewage treatment plant as $25,290 per year is attributed to the collection system from the Taylor Run Interceptor through the Taylor Run Pumping Station and Washington Street Pumping Station to the treatment plant.

Notes:

(1) The discount rate represents the cost of funds expressed as an annual interest rate. The scheduled rate is based on Municipal Bond yields as reported by the Federal Reserve Board.

(2) The present value is computed using standard financial computations which discount actual payment streams to the present value based on the payment term, the discount rate, and the payment amounts.

(3) The cost index is computed from cost information provided by Engineering News Record based on relative costs of construction over time. Computational differences result because more significant figures than are presented in the schedule were actually used.

Exhibit III

West Goshen Sewer Authority
Present Value Computation for East Goshen Payments I

Pmt No.	From Date	To Date	Payment Amount	Present Value
1	10/01/77	12/31/77	7,014.25	7,014.25
2	01/01/78	06/30/78	14,028.50	13,649.06
3	07/01/78	12/31/78	14,028.50	13,279.88
4	01/01/79	06/30/79	14,028.50	12,920.68
5	07/01/79	12/31/79	14,028.50	12,571.20
6	01/01/80	06/30/80	14,028.50	12,231.17
7	07/01/80	12/31/80	10,236.00	8,683.18
8	01/01/81	06/30/81	10,236.00	8,448.31
9	07/01/81	12/31/81	10,236.00	8,219.80
10	01/01/82	06/30/82	10,236.00	7,997.47
11	07/01/82	12/31/82	10,236.00	7,781.16
12	01/01/83	06/30/83	10,236.00	7,570.69
13	07/01/83	12/31/83	10,236.00	7,365.92
14	01/01/84	06/30/84	10,236.00	7,166.68
15	07/01/84	12/31/84	10,236.00	6,972.84
16	01/01/85	06/30/85	10,236.00	6,784.24
17	07/01/85	12/31/85	10,236.00	6,600.74
18	01/01/86	06/30/86	10,236.00	6,422.20
19	07/01/86	12/31/86	10,236.00	6,248.49
20	01/01/87	06/30/87	10,236.00	6,079.48
21	07/01/87	12/31/87	10,236.00	5,915.04
22	01/01/88	06/30/88	10,236.00	5,755.05
23	07/01/88	12/31/88	10,236.00	5,599.39
24	01/01/89	06/30/89	10,236.00	5,447.94
25	07/01/89	12/31/89	10,236.00	5,300.58
26	01/01/90	06/30/90	10,236.00	5,157.21
27	07/01/90	12/31/90	10,236.00	5,017.72
28	01/01/91	06/30/91	10,236.00	4,882.00
29	07/01/91	12/31/91	10,236.00	4,749.95
30	01/01/92	06/30/92	10,236.00	4,621.47
31	07/01/92	12/31/92	10,236.00	4,496.47
32	01/01/93	06/30/93	10,236.00	4,374.85
33	07/01/93	12/31/93	10,236.00	4,256.52
34	01/01/94	06/30/94	10,236.00	4,141.39
35	07/01/94	12/31/94	10,236.00	4,029.37
Totals			374,000.75	247,752.41

36	01/01/95	06/30/95	10,236.00	3,920.39	
37	07/01/95	12/31/95	10,236.00	3,814.35	X 2.109 = 8,044.46
38	01/01/96	06/30/96	10,236.00	3,711.18	
39	07/01/96	12/31/96	10,236.00	3,610.80	
40	01/01/97	06/30/97	10,236.00	3,513.13	
41	07/01/97	12/31/97	10,236.00	3,418.11	
42	01/01/98	06/30/98	10,236.00	3,325.65	
43	07/01/98	12/31/98	10,236.00	3,235.70	
44	01/01/99	06/30/99	10,236.00	3,148.18	
45	07/01/99	12/31/99	10,236.00	3,063.03	
46	01/01/00	06/30/00	10,236.00	2,980.18	
47	07/01/00	12/31/00	10,236.00	2,899.57	
48	01/01/01	06/30/01	10,236.00	2,821.15	
49	07/01/01	12/31/01	10,236.00	2,744.84	
50	01/01/02	06/30/02	10,236.00	2,670.60	
			527,540.75	296,629.26	

10,236 ÷ 3814.35 = 2.684

Exhibit IV

West Goshen Sewer Authority
Present Value Computation for East Goshen Payments II

Pmt No.	From Date	To Date	Payment Amount	Present Value
1	04/01/78	09/01/78	11,817.88	11,817.88
2	09/01/78	02/28/79	17,421.75	16,922.54
3	03/01/79	08/31/79	17,421.75	16,437.63
4	09/01/79	02/29/80	17,835.39	16,345.70
5	03/01/80	08/31/80	17,835.39	15,877.32
6	09/01/80	02/28/81	17,680.44	15,288.38
7	03/01/81	08/31/81	17,680.41	14,850.27
8	09/01/81	02/28/82	17,519.76	14,293.67
9	03/01/82	08/31/82	17,519.76	13,884.09
10	09/01/82	02/28/83	17,519.76	13,486.24
11	03/01/83	08/31/83	17,893.44	13,379.21
10.5	06/06/83		373.78	283.57
12	09/01/83	02/29/84	17,694.72	12,851.50
13	03/01/84	08/31/84	17,694.72	12,483.24
14	09/01/84	02/28/85	17,489.52	11,984.93
15	03/01/85	08/31/85	17,489.52	11,641.50
16	09/01/85	02/28/86	17,814.84	11,518.25
17	03/01/86	08/31/86	17,817.84	11,190.09
18	09/01/86	02/28/87	18,114.84	11,050.62
19	03/01/87	08/31/87	18,114.84	10,733.97
20	09/01/87	02/29/88	18,114.84	10,426.39
21	03/01/88	08/31/88	17,558.64	9,816.66
22	09/01/88	02/28/89	9,615.24	5,221.64
23	03/01/89	08/31/89	16,419.24	8,661.11
24	09/01/89	02/28/90	16,667.64	8,540.20
25	03/01/90	08/31/90	16,667.64	8,295.48
26	09/01/90	02/28/91	16,340.94	7,899.84
27	03/01/91	08/31/91	11,237.99	5,277.20
28	09/01/91	02/29/92	15,147.57	6,909.26
29	03/01/92	08/31/92	10,044.61	4,450.36
30	09/01/92	02/28/93	15,318.56	6,592.56
31	03/01/93	08/31/93	15,318.56	6,403.65
32	09/01/93	02/28/94	15,161.12	6,156.22
33	03/01/94	08/31/94	15,161.12	5,979.82
34	09/01/94	02/28/95	15,730.57	6,026.63
Totals			555,254.63	362,977.59

35	03/01/95	08/31/95	15,750.57	5,853.94
36	09/01/95	02/28/96	15,154.23 *	5,477.87 *
37	03/01/96	08/27/96	15,154.23	5,320.90
38	09/01/96	02/24/97	15,103.46	5,151.12
39	03/01/97	08/24/97	15,103.46	5,003.51
40	09/01/97	02/21/98	15,221.86	4,898.24
41	03/01/98	08/21/98	15,221.86	4,757.88
42	09/01/98	02/18/99	15,030.34	4,563.40
43	03/01/99	08/18/99	15,030.34	4,432.63
44	09/01/99	02/15/00	15,008.52	4,299.37
45	03/01/00	08/14/00	15,008.52	4,176.17
46	09/01/00	02/11/01	14,964.90	4,044.72
47	03/01/01	08/11/01	14,964.90	3,928.82
48	09/01/01	02/08/02	13,014.00	3,318.73
49	03/01/02	08/08/02	13,014.00	3,223.64
50	09/01/02	02/05/03	12,904.65	3,104.95
51	03/01/03	08/05/03	12,904.65	3,015.98
52	09/01/03	02/02/04	12,745.35	2,893.40
53	03/01/04	08/01/04	12,745.35	2,810.49
54	09/01/04	01/29/05	13,076.10	2,800.80
55	03/01/05	07/29/05	13,076.10	2,720.54
56	09/01/05	01/29/06	13,306.95	2,689.24
57	03/01/06	07/29/06	13,306.95	2,612.18
58	09/01/06	01/29/07	12,897.90	2,459.33
59	03/01/07	07/29/07	12,897.90	2,388.86
60	09/01/07	01/29/08	12,978.90	2,334.98
61	03/01/08	07/29/08	12,978.90	2,268.07
			933,799.49	463,527.34

* 15,154.23 ÷ 5477.87 = 2.766

Exhibit V

West Goshen Sewer Authority
Sewer Plant Investment Allocation Analysis

	Allocated Capacity	Percent Capacity	Current Cost Value	Allocated Cost Value	Difference
			2,078,268	1,822,433	
West Goshen	2,850,000	63.3%	$ 8,037,757	$ 7,163,531	$ 874,226
East Goshen	1,000,000	22.2%	~~$ 1,532,290~~	~~$ 2,513,004~~	~~(980,714)~~ ← $255,835
West Whiteland	420,000	9.3%	$ 850,895	$ 1,055,190	(204,295)
Westtown	230,000	5.1%	$ 888,606	$ 577,923	310,683
Totals	4,500,000	100.0%	$ 11,309,648	~~$ 11,309,648~~	$ -
				8,201,768	

Allocated Capacity: Gallonage of treatment plant capacity in accordance with current intermunicipal agreements.

Percent Capacity: Percentage of each municipality's share of total treatment plant capacity based on current intermunicipal agreements.

Current Cost Value: Based on actual investment values which have been restated to current value based on Engineering News Record Construction Cost indices as computed in Exhibits I and II.

Allocated Cost Value: Based on each municipality sharing equally the costs of the treatment plant as if they were utilizing their share of the capital costs of the plant starting in 1963.

Difference: Current Cost Value less allocated cost value. A positive number indicates overpayment or subsidizing of plant capital costs and a negative value indicates a shortfall or a subsidized amount if all parties share equally in the plant's capital costs.

AREA CODE 610
692-7171

EAST GOSHEN MUNICIPAL AUTHORITY
EAST GOSHEN TOWNSHIP
1580 PAOLI PIKE, WEST CHESTER, PA 19380-6199

May 9, 1996

West Goshen Township
Board of Supervisors
Municipal Authority
1025 Paoli Pike
West Chester, Pa 19380

Re: Additional Sewage Capacity

Dear Board Members:

At a joint meeting held on May 2, 1996, the East Goshen Board of Supervisors and Municipal Authority discussed your proposal of the costs related to the acquisition of additional capacity at the West Goshen Treatment Plant.

East Goshen would be willing to discuss a proportionate fair share of the estimated $6.00 per gallon and administrative charge for the expansion project as detailed in the Estimated Construction Costs for the Phase I expansion.

However, based on reviews by legal, accounting and engineering consultants, the members of both boards agree that they can not pay for the Sewer Plant Investment Allocation Costs of $1,240,942 as outlined in Exhibit V.

Please advise if you are interested in discussing this matter further.

Very truly yours,

E. Martin Shane /SKF

E. Martin Shane, Chairman
Board of Supervisors

Francis X. Beck, Jr. /SKF

Francis X. Beck, Jr., Chairman
East Goshen Municipal Authority

EMS/FXB/skf
cc: Robert F. Adams, Esq.
John B. Yerkes, Jr., P.E.
Jeffrey S. Rolfe
East Goshen Board of Supervisors
East Goshen Municipal Authority
wperf\wgprop

Board of Supervisors

1025 Paoli Pike
West Chester, PA 19380-4699
(610) 696-5266
[redacted]
Fax: (610) 429-0616

MAY 14 1996

May 10, 1996

Mr. Rick Smith, Manager
East Goshen Township
1580 Paoli Pike
West Chester, PA 19380

Dear Rick,

As per our phone conversation on Friday morning 5/10/96, my board will extend the cut-off date for East Goshen's answer for additional sewage capacity until 5/31/96 at 12:00 Noon.

As previously stated, our final terms are $980,000 past capital expenses, 20,000 administrative costs, and a unified O&M on collections. These are non-negotiable terms for your additional capacity. The only discussion is if Max Stoner's numbers are in error. We are looking for a yes or no answer.

I will be available, as well as John Scott, to answer your questions. Be advised that all of our foreign capacity is now spoken for. What is being offered would be taken from West Goshen's allotment.

Remember, good times disappear fast when no toilets are available.

Bob, Sam

Robert S. White, Member
For Board of Supervisors

RSW/sam

cc: Board of Supervisors
John Scott
Sewer Expansion File
corres.

Yerkes

YERKES ASSOCIATES, INC. 1444 Phoenixville Pike, P.O. Box 1568, West Chester, PA 19380-0078 • (610) 644-4254 FAX: (610) 640-0771

May 28, 1996

Supervisors of East Goshen
1580 Paoli Pike
West Chester, Pennsylvania 19380

MAY 30 1996

East Goshen Municipal Authority
1580 Paoli Pike
West Chester, Pennsylvania 19380

Attn: Rick Smith, Manager

RE: West Goshen Sewage Treatment Plant

Gentlemen:

I am enclosing our estimate of the depreciated worth of the West Goshen Sewage Treatment Plant.

In 1963 dollars it is $264,620.

Please call with any questions.

Very truly yours,

YERKES ASSOCIATES, INC.

John B. Yerkes Jr. (dmk)

John B. Yerkes, Jr., P.E.
President

JBY/dmk
cc: Mr. Jeff Rolfe
East Goshen Municipal Authority, Sue Fish
c:\wpwin\letter\ricksmit.jby

WEST GOSHEN SEWAGE TREATMENT PLANT COSTS - MAY 28, 1996

1963 Cost $1,298,624 - After PL660 and E.P.A. Funds Were Applied.

E.N.R.: 1963 to 1977 = 2.77
1963 to 1995 = 6.028

Component	Original Cost		Estimated	1995 Value After St. Line Deprec. (In 1963 Dollars)	
	Percent	Dollars	Life - Years	Percent	Dollars
Tankage	35.8	464,908	50	34	158,069
Machinery	6.3	81,813	25	0	
Electrical	15.0	194,794	35	9.4	18,310
Piping	10.54	136,875	40	25	34,219
Site Improvements	10.8	140,251	20	0	
Control Buildings	9.1	118,175	30	0	
Lift Station	8.3	107,786	25	0	
Land	4.16	54,022	-	100.0	54,022
TOTALS		$1,298,624			$264,620

c:\wpwin\treplant.jby

MAILLIE, FALCONIERO & COMPANY
Certified Public Accountants and Business Counselors

22 North Church Street
PO Box 3068
West Chester, PA 19381-3068
610/696-4353

FAX NO.: 430-8811

James J. Lennon
George J. Falconero
Paul T. Truono
John J. Crenny, Jr.
Frank L. Pellegrini
Jeffrey S. Rolfe
James M. Powers
Glenn B. Bachman
D. Scott Detar
Raymond T. Mock
Robert L. Caruso
Edward J. Furman

May 29, 1996

East Goshen Township
Board of Supervisors
Municipal Authority

Dear Board Members:

We have recalculated the alleged shortfall of East Goshen's payments towards its share of the capital costs of the West Goshen Sewage Treatment Plant, as originally calculated by Max Stoner of Glace Associates, Inc. Our recalculation of the alleged shortfall does not in any way endorse or express agreement with the logic, facts or methods used in Mr. Stoner's original analysis.

East Goshen did not become a user of the West Goshen Plant until 1970. From 1970 until 1977 East Goshen paid West Goshen to treat sewage from East Goshen on a fixed price per "unit of service" basis. In 1977, East Goshen and West Goshen entered into an agreement which provided for the sharing of operating and capital costs by both Townships to the extent each used the other's facilities. Mr. Stoner's analysis did not give recognition to the fact that from 1963 to 1977 East Goshen either did not use the plant, or when it did, paid a fixed fee per unit of service which was not allocated between capital and operating costs.

Our recalculation provides for depreciation of the West Goshen Plant from 1963 to 1977 when East Goshen began paying a charge for useage of the plant which separately identified capital and operating charges. The depreciation of the plant is based on an analysis by Yerkes Associates, Inc.

Working with the revised analysis received from West Goshen:

1. On "Exhibit I" the "Original Cost Basis" of the 1963 initial cost ($1,298,624) is replaced by the net book value of $783,127 from the attached depreciation schedule.

2. This causes the "Indexed Cost Basis" for 1963 to change from $7,828,570 to $4,720,690 and the total costs to change from $11,309,648 to $8,201,768.

3. The change in "total costs" from 2, above, is then carried to Exhibit V where the total of the "Allocated Cost Value" of $11,309,648 is changed to $8,201,768.

4. East Goshen's 22.22% share of the "Allocated Cost Value" then changes from $2,513,004 to $1,822,433.

5. The "difference" betwen the "Current Cost Value" and "Allocated Cost Value" for East Goshen then becomes $(290,043), which is the revised alleged shortfall.

Additionally, there is an inconsistency in the way East Goshen's payments are discounted to a 1977/1978 present value in Exhibits III and IV at one discount rate and then "future valued" to current values at a different rate. For example, the 7/1/95 payment on Exhibit III of $10,236.00 is present valued to $3,814.35, and then restated on Exhibit II to June 1995 value of $8,044.46 ($3,814.35 x 2.109), losing $2,191.54 in the process.

If the same discount rates were used on Exhibit II to compute the "Current Cost Value" as were used on Exhibits III and IV, then the "Cost Index" for East Goshen Payments I and II would be 2.684 and 2.766, and the "Current Cost Values" would be $796,152 and $1,282,116, reducing the alleged shortfall by $545,878.

The combination of the two adjustments to Mr. Stoner's analysis, providing for depreciation on the original plant and using the same factors to present value and future value the East Goshen payments, completely eliminates the alleged shortfall in East Goshen's payments towards its share of the capital costs of the West Goshen Sewage Treatment Plant.

Please feel free to contact me if you have any questions.

Very truly yours,

Jeffrey S. Rolfe

JEFFREY S. ROLFE

JSR/bj

EAST GOSHEN TOWNSHIP
WEST GOSHEN SEWAGE TREATMENT PLANT
DEPRECIATED COST

COMPONENT	PERCENT OF COST	ORIGINAL COST	ESTIMATED LIFE - YEARS	ACCUM DEPREC 1,977	NET BOOK VALUE 1,977
TANKAGE	35.80%	464,907	50	130,174	334,733
MACHINERY	6.30%	81,813	25	45,815	35,998
ELECTRICAL	15.00%	194,794	35	77,918	116,876
PIPING	10.54%	136,875	40	47,906	88,969
SITE IMPROVEMENTS	10.80%	140,251	20	98,176	42,075
CONTROL BUILDINGS	9.10%	118,175	30	55,148	63,027
LIFT STATION	8.30%	107,786	25	60,360	47,426
LAND	4.16%	54,023	N/A	0	54,023
	100.00%	1,298,624		515,497	783,127

AREA CODE 610
692-7171

EAST GOSHEN MUNICIPAL AUTHORITY
EAST GOSHEN TOWNSHIP
1580 PAOLI PIKE, WEST CHESTER, PA 19380-6199

May 30, 1996

West Goshen Township
Board of Supervisors
and
Municipal Authority
1025 Paoli Pike
West Chester, Pa 19380

Re: Additional Sewage Capacity

Dear Board Members:

We are in receipt of your letter of May 10, 1996 signed by Supervisor Robert S. White. We have not abandoned the position stated in our letter of May 9, 1996 but appreciate the opportunity to review your calaculations.

East Goshen's engineering and financial consultants have examined the calculations of the alleged shortfall in the capital costs paid to West Goshen by East Goshen. Our consultants believe depreciation should be factored into the calculations for the years 1963 - 1977. Additionally, our calculations use the same index factor to discount the 1977/1978 present values and the "future values" shown in Exhibits II, III and IV which are enclosed. We are also enclosing letters from our engineer, John B. Yerkes, Jr., dated May 28, 1996, and auditor Jeffrey S. Rolfe, dated May 29, 1996, supporting our position. Our conclusion is that there is no shortfall due to West Goshen. We are willing to discuss with you the basis for this conclusion.

We feel that both townships have mututally benefited from the 1977 Agreement and look forward to a continuing partnership with West Goshen. To this end, we are willing to discuss purchasing additional capacity for a proportionate fair share of the estimated $6.00 per gallon and administrative charge for the expansion project as detailed in the Estimated Construction Costs for the Phase I expansion.

Very truly yours,

E. Martin Shane
E. Martin Shane, Chairman
Board of Supervisors

Francis X. Beck
Francis X. Beck, Chairman
Municipal Authority

EMS/FXB/skf
enclosures
cc: Robert F. Adams, Esq.
John B. Yerkes, Jr., P.E.
Jeffrey S. Rolfe, Maillie, Falconiero & Company
East Goshen Board of Supervisors
East Goshen Municipal Authority

SUPPORTING DOCUMENTS

ACT 537 PLAN CONTENT AND ENVIRONMENTAL ASSESSMENT CHECKLIST

D.E.P. USE ONLY	PAGE #	ITEM REQUIRED

Municipality: EAST GOSHEN TOWNSHIP County: CHESTER

Local Municipal Official LOUIS F. SMITH, JR. Telephone # of Official: (610) 692-7171

Consultant: YERKES ASSOC., INC. Consultant's Phone #: (610) 644-4254

Consultant's Contact Person: DAVID V. LINAHAN, P.E.

Title of Submission: SPECIAL STUDY AREA - RIDLEY CREEK SEWAGE TREATMENT PLANT EXPANSION Date Submitted: OCTOBER 1997

x☐ 3 copies of Plan submitted to the Department (including supporting documentation)

COMPLETENESS CHECKLIST

	Vol I, pg I Vol II pg I	**1. Table of Contents**
		2. Plan Summary
	Vol I, pg 2	A. Identify the proposed service areas and major problems evaluated in the plan. (Reference: Title 25, § 71.1.a.7.i)
	Vil I, pgs 3-4	B. Identify the alternative(s) chosen to solve the problems and serve the areas of need identified in the plan. Also, include any institutional arrangements necessary to implement the chosen alternative(s). (Reference: Title 25, § 71.21.a.7.ii)
	N/A	C. Include the cost of implementing the proposed alternative (including the user fees) and the proposed funding method to be used. (Reference: Title 25, § 71.21
	Vol I, pg 5	D. Identify the municipal commitments necessary to implement the plan. (Reference: Title 25, § 71.21.a.7.iii)
	Vol I, pg 6	E. Provide a schedule of implementation for the project which identifies the major milestones with dates necessary to accomplish the project to the point of op status. Other milestones in the project implementation schedule should be indicated as occurring a finite number of days from a major milestone. (Reference: Title 25, § 71.21.a.7.iv)
	Vol I, pg 6	F. Include dates for the future initiation of feasibility evaluations in the project's implementation schedule for areas proposing completion of sewage facilities for planning periods in excess of five years. (Reference: Title 25, § 71.21.b)
	Vol II, Section F	3. Original, signed and sealed Resolution of Adoption by the Municipality which contains, at a minimum, alternatives chosen and a commitment to implement plan as stated in the implementation schedule. (Reference: Title 25, § 71.31.f) Section V.F of Guidance.
	Vol II, Section F	4. Evidence that the municipality has requested, reviewed, and considered comments by appropriate official: planning agencies of the municipality, planning agencies of the

date: September 15, 1997

D.E.P. USE ONLY	PAGE #	ITEM REQUIRED
		county, planning agencies with areawide jurisdiction (where applicable), and existing county or joint county departments of health. (Reference: Title 25, § 71.31.b) Section V.E. 1. of guidance.
	Vol II, Section F	5. Proof of Public Notice which documents proposed plan adoption, plan summary, and the establishment of a 30 day comment period. (Reference: Title 25. § 71.31.c) Section V.E.2 of guidance.
	Vol II, Section F	6. Copy of ALL written comments received and municipal response to each comment in relation to the proposed plan. (Reference: Title 25, § 71.31.c) Section V.E.2 of guidance.
	Vol II, Section E pg 6	7. Project Implementation Schedule. (Provide projected milestone dates and be detailed for each existing and future needs area). (Reference: Title 25, § 71.31.d) Section F of Guidance.
	N/A	8. Project Implementation Ordinances (Provide existing ordinances or include the development of new ordinances in the schedule of implementation.) (Reference: Title 25, § 71.21.a.5.vi.D) Section V.F of guidance.
	Vol II, Section F	9. Written documentation indicating that the appropriate agencies have received, reviewed and concurred with the method proposed to resolve identified inconsistencies within the proposed alternative and consistency requirements in 71.21.(a)(5)i)-(iii). (Reference: Title 25, § 71.3 1.e) Appendix B of guidance.
		GENERAL PLAN
		1. Previous Wastewater Planning
	See Act 537 Plan appvd 6/95	A. Identify and analyze all existing wastewater planning that:
	See Act 537 Plan appvd 6/95	1. Has been previously undertaken under the Sewage Facilities Act (Act 537). (Reference: Act 537, Section 5, section d.1)
	See Act 537 Plan appvd 6/95	2. Has not been carried out according to an approved implementation schedule contained in the plans. (Reference: Title 25, § 71.21.a.5.i.A - D) Section V.F of Guidance.
	See Act 537 Plan appvd	3. Is anticipated or planned by applicable sewer authorities. (Reference: Title 25, § 71.21.a.5.i.A) Section V.D. of Guidance.

date: September 15, 1997

D.E.P. USE ONLY	PAGE #	ITEM REQUIRED
	6/95	
	See Act 537 Plan appvd 6/95	4. Has been done through official plan revisions (planning modules) and addenda. (Reference: Title 25, § 71.21.a.5.i.A)
	See Act 537 Plan appvd 6/95	B. Identify all municipal and county planning documents adopted pursuant to the Pennsylvania Municipalities Planning Code (Act 247) including:
	See Act 537 Plan appvd 6/95	1. All land use plans and zoning maps which identify residential, commercial, industrial, agricultural, recreational, and open space areas. (Refe Title 25, § 71.21.a.3.iv)
	See Act 537 Plan appvd 6/95	2. A comparison of proposed land use as allowed by zoning and existing sewage facility planning. (Reference: Title 25, § 71.21.a.3.iv)
	See Act 537 Plan appvd 6/95	3. Zoning or in the absence of zoning subdivision regulations that establish lot sizes predicated on sewage disposal methods. (Reference: Title 25, § 71.21.a.3.iv)
	See Act 537 Plan appvd 6/95	4. All limitations and plans related to floodplain and stormwater management and special protection areas. (Reference: Title 25, § 71.21.a.3.iv) Appendix B, Section II.F.
	See Act 537 Plan appvd 6/95	5. An analysis of land use planning and zoning and its consistency with protecting environmentally sensitive areas, with special attention to: (Reference: Title 25, § 71.21.a.3.iv) - public ground/surface water supply sources - recreational water use areas - groundwater recharge areas - industrial water use - wetlands
		II. Physical and Demographic Analysis utilizing written description and mapping:
		A. Base line mapping (All maps should show all current lots and structures).
	Vol I, Exhibit 5	1. Identification of Planning Area(s). Municipal Boundaries, Sewer Authority/ Management Agency service area boundaries. (Reference: Title 25, § 71.21.a.1.i)
	See Act 537 Plan appvd 6/95	2. Identification and Mapping of Physical Characteristics (streams, lakes, impoundments, natural conveyance channels, drainage basins in the planning area). (Reference: Title 25, § 71.21.a.l.ii)

date: September 15, 1997

ACT 537 PLAN CONTENT AND ENVIRONMENTAL ASSESSMENT CHECKLIST

D.E.P. USE ONLY	PAGE #	ITEM REQUIRED
	See Act 537 Plan appvd 6/95	3. Soils - Analysis with description by soil type and soils mapping with any topographic limitations) showing areas suitable for conventional on-lot systems, elevated sand mounds, and areas unsuitable for on-lot systems. (Reference: Title 25, § 71.21.a.1.iii). Mapping of Prime Agricultural Soils and locally protected agricultural soils. (Reference: Title 25, § 71.21.a.5.i.K)
	See Act 537 Plan appvd 6/95	4. Geologic Features - Identification through analysis, mapping and their relation to existing (including areas where existing nitrate-nitrogen levels are in excess of 5 mg/l) or potential nitrate-nitrogen pollution and drinking water sources. (Reference: Title 25, § 71.21.a.1.iii)
	See Act 537 Plan appvd 6/95	5. Topography - Showing slopes that are suitable for conventional systems; slopes that are suitable for elevated sand mounds and slopes that are unsuitable for on-lot systems. (Reference: Title 25, § 71.21.a.1.ii)
	See Act 537 Plan appvd 6/95	6. Potable Water Supplies - Identification through mapping, description and analysis to include available public water supply capacity and aquifer yield for groundwater supplies. (Reference: Title 25, § 71.21.a.1.vi) Section V.C. of the Guidance.
	See Act 537 Plan appvd 6/95	7. Wetlands - Identify wetlands as defined in Title 25, Chapter 105 by description, analysis and mapping. Proposed collection, conveyance and trea facilities and lines must be located and labeled, along with the identified wetlands, on the map. (Reference: Title 25, § 71.21.a.1.v) Appendix B, Section II.I.
	See Act 537 Plan appvd 6/95	8. Population - List historical, current and future population figures and projections of the municipality. Discuss and evaluate any discrepancies between municipal, county, state (DER), and federal population projections as they relate to sewage facilities. (Reference: Title 25, § 71.21.a.1.iv)
	See Act 537 Plan appvd 6/95	**III. Existing Sewage Facilities in the Planning Area.**
	See Act 537 Plan appvd 6/95	**A. Identify, map and describe municipal and non-municipal, individual and community sewerage systems in the planning area including:**
	See Act 537 Plan appvd 6/95	1. Location, size and ownership of treatment facilities, main intercepting lines, pumping stations and force mains including their size, capacity, point of discharge. Also include the name of the receiving stream, drainage basin, and the facility's effluent discharge requirements. (Reference: Title 25, § 71.21.a.2.i.A)
	See Act 537 Plan appvd 6/95	2. A narrative and schematic diagram of the facility's basic treatment processes including the facility's NPDES permitted capacity, any remaining reserve capacity and the policy concerning the allocation of reserve capacity. (Reference: Title 25, § 71.21.a.2.i)

date: September 15, 1997

D.E.P. USE ONLY	PAGE #	ITEM REQUIRED
	See Act 537 Plan appvd 6/95	3. A description of problems with existing facilities, including existing or projected overload under Title 25, Chapter 94 (relating to municipal wasteload management) or violations of a national pollutant discharge elimination system (NPDES) permit, Clean Streams Law permit, or other permit, rule or regulation of the Department. (Reference: Title 25, § 71.21.a.2.i.B)
	See Act 537 Plan appvd 6/95	4. Details of scheduled or in-progress upgrading or expansion of treatment facilities and the anticipated completion date of the improvements. Also discuss the compatibility of the rate of growth to existing and proposed wastewater treatment facilities. (Reference: Title 25, § 71.21.a.4.i & ii)
	See Act 537 Plan appvd 6/95	5. A detailed description of operation and maintenance requirements and the status of past and present compliance with these requirements and any other requirements relating to sewage management programs. (Reference: Title 25, § 71.21.a.2.i.C)
	See Act 537 Plan appvd 6/95	6. Ultimate disposal areas, if other than stream discharge (land application) and any applicable groundwater limitations. (Reference: Title 25, § 71.21.a.4.i & ii)
	See Act 537 Plan appvd 6/95	**B. Identify, map and describe areas that utilize individual and community on-lot sewage disposal and retaining tank systems in the planning area including.**
		1. The type of systems in use. (Reference: Title 25, § 71.21.a.2.ii.A)
	N/A	2. A description of documented and potential public health pollution, and operational problems (including malfunctioning systems) with the systems, including violations of local ordinances, the Sewage Facilities Act, the Clean Streams Law or regulation promulgated thereunder. (Reference: Title 25, § 71.21.a.2.ii.B)
	N/A	3. A comparison of the types of on-lot sewage systems installed in an area with the types of systems which are appropriate for the area according to soil, geologic conditions, topographic limitations, sewage flows, and Title 25 Chapter 73 (relating to standards for sewage disposal facilities). (Reference: Title 25, § 71.21.a.2.ii.C)
	N/A	4. Conducting a well water survey to identify possible contamination by malfunctioning on-lot sewage disposal systems. Approximately 15% of the wells in the study area should be sampled. (Reference: Title 25, § 71.21.a.2.ii.B)
		C. Identify wastewater sludge and septage generation, transport, and disposal methods as it relates to sewage facilities alternative analysis including:
	See Act 537 Plan appvd 6/95	1. Location of sources of wastewater sludge or septage (Septic tanks, holding tanks, wastewater treatment facilities). (Reference: Title 25, § 71.71)
	See Act 537 Plan appvd 6/95	2. Quantities of the types of sludges or septage generated. (Reference: Title 25,§ 71.71)

date: September 15, 1997

D.E.P. USE ONLY	PAGE #	ITEM REQUIRED
	See Act 537 Plan appvd 6/95	3. Present disposal methods, locations, capacities, and transportation methods. (Reference: Title 25, Section 71.71)
	N/A	**D. Identify, map and describe areas in the municipality where unpermitted collection and disposal systems ("wildcat" sewers, borehole disposal. etc.) are in use. (Reference: Title25,§ 71.21.a.2.i.B)**
	See Act 537 Plan appvd 6/95	**IV. Future Growth and Development**
		A. Delineate and describe the following through map, text and analysis:
	EXHIBITS 1 - 3 A	1. Areas with existing development or plotted subdivisions. Include the name, location, description, total number of EDU's in development, total number of EDU's currently developed, and total number of Equivalent Dwelling Units (EDUs) remaining to be developed (include time schedule for EDU's remaining to be developed). (Reference: Title25, Section 71.21.a.3.i)
	JUNE, 1995 PLAN EXHIBIT 6 (ZONING MAP)	2. Land use designations established under the Pennsylvania Municipalities Planning Code (35 P.S. 10101-11202), including residential, co and industrial areas. (Reference: Title25, Section 71.21.a.3.ii)
	EXHIBITS 1 - 3 A	3. Future growth areas and population and EDU projections for these areas. (Reference: Title25, Section 71.21.a.3.iii)
	N/A	4. Zoning, subdivision regulations; local, county or regional comprehensive plans; and existing plans of a Commonwealth agency relating to the development, use and protection of land and water resources. (Reference: Title25,§71.21.a.3.iv)
	EXHIBITS 1 - 3 A	5. Sewage planning required to provide adequate wastewater treatment for areas of the municipality and related to:
	Vol II, pg 2	a. Five-year population and growth impacts on existing and proposed wastewater collection and treatment facilities which support the need for expansions of facilities within the five-year time frame. (Reference: Title 25, section 71.21.a.3.v)
	Vol I, pg 2	b. Ten-year population and growth impacts on existing and proposed wastewater collection and treatment facilities which support the need for expansions of facilities within the ten-year time frame. (Reference: Title 25, Section 71.21.a.3.v)

ACT 537 PLAN CONTENT AND ENVIRONMENTAL ASSESSMENT CHECKLIST

D.E.P. USE ONLY	PAGE #	ITEM REQUIRED
		V. Alternatives to Provide New or Improved Wastewater Disposal Facilities
	Vol I, pg 3	A. Identify alternatives available to provide for new or improved sewage facilities for each area of need including, but not limited to: (Reference: Title 25,§ 71.21.a.4)
	See Act 537 Plan appvd 6/95	1. Regional Wastewater Treatment Concepts. (Reference: Title 25, § 71.21.a.4)
	N/A	2. The potential for extension of existing municipal or non-municipal sewage facilities to areas in need of new or improved sewage facilities. (Reference: Title25, Section 71.21.a.4.i)
	N/A	3. The potential for the continued use of existing municipal or non-municipal sewage facilities through one or more of the following: (Reference: Title 25, § 71.21.a.4.ii)
	N/A	a. Repair. (Reference: Title 25, § 71.21.a.4.ii.A)
	N/A	b. Upgrading. (Reference: Title 25, Section 71.21.a.4.ii.B)
	N/A	c. Improved operation and maintenance. (Reference: Title 25,§ 71.21.a.4.ii.C)
	N/A	d. Other applicable actions that will resolve or abate the identified problems. (Reference: Title 25, § 71.21.a.4.ii.D)
	N/A	4. The need for new community sewage systems. (Reference: Title 25, § 71.21.a.4.iii)
	Vol I, pg3 Vol II, pg 8	5. The construction of new wastewater treatment facilities. (Reference: Title 25, § 71.21.a.4.iii)
	N/A	6. Repair or replacement of collection and conveyance system components . (Reference: Title 25,§ 71.21.a.4.ii.A)
	N/A	7. Use of alternative methods of collection/conveyance to serve needs areas using existing wastewater treatment facilities. (Reference: Title 25, § 71.21.a.4.ii.B)
	N/A	8. The continual and future use of individual and community subsurface sewage disposal system alternatives based on:
	N/A	a. Soil suitability. (Reference: Title 25, § 71.21.a.2.ii.C)
	N/A	b. Preliminary hydrogeological evaluation. (Reference: Title 25, § 71.21.a.2.ii.C)
	N/A	c. The establishment of a sewage management program. (Reference: Title 25, § 71.21.a.4.iv) **See Township Ordinance 166 and Authority Rules Chapter VI & VII**
	See Act 537 Plan appvd	9. The repair, replacement or upgrading of existing malfunctioning systems in areas suitable for on-lot disposal considering: (Reference: Title 25, § 71.21.a.4)

date: September 15, 1997

D.E.P. USE ONLY	PAGE #	ITEM REQUIRED
	6/95	
	N/A	a. Existing technology and sizing requirements of Title 25 Chapter 73. (Reference: Title 25, § 73.31 - 73.72)
	N/A	b. Use of expanded absorption areas or alternating absorption areas. (Reference: Title 25, § 73.16)
	N/A	c. Use of water conservation devices. (Reference: Title 25, § 71.73.b.2.iii)
	N/A	10. The use of small flow sewage treatment facilities, land treatment alternatives, or package treatment facilities to serve individual homes or clusters of homes based on: (Reference: Title 25, § 71.21.a.4)
	N/A	a. Discharge Requirements. (Reference: Title 25, § 71.64.d)
	N/A	b. Soil Suitability. (Reference: Title25, Section 71.64.c.1) c. Preliminary Hydrogeologic Evaluation. (Reference: Title 25, §71.64.c.3)
	N/A	d. Agency or other controls over operation and maintenance requirements. (Reference: Title 25, § 71.64.d)
	N/A	11. The use of retaining tank alternatives including: (Reference: Title 25, § 71.21.a.4)
	N/A	a. Commercial, residential and industrial use. (Reference: Title 25, § 71.63.e)
	N/A	b. Designated conveyance facilities (pumper trucks). (R Title 25, § 71.63.b.2)
	N/A	c. Designated treatment facilities or disposal site. (Reference: Title 25, § 71.63.b.2)
	N/A	d. Implementation of a retaining tank ordinance by the municipality. (Reference: Title 25, § 71.63.c.3)
	N/A	e. Financial guarantees when retaining tanks are used as an interim sewage disposal measure. (Reference: Title 25, § 71.63.c.2)
	N/A	f. Temporary or permanent use.
	N/A	12. A no-action alternative which includes both short-term and long-term impacts on: (Reference: Title 25, § 71.21.a.4)
	N/A	a. Water Quality/Public Health. (Reference: Title 25,§ 71.21.a.4)
	N/A	b. Growth potential (residential, commercial, industrial). (Ref Title 25, § 71.21.a.4)
	N/A	c. Community economic conditions. (Reference: Title 25 § 71.21.a.4)
	N/A	d. Recreational opportunities. (Reference: Title 25, § 71.21. a.4)
	N/A	e. Drinking water sources. (Reference: Title 25, § 71.21. a.4)

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	N/A	f. Other environmental concerns. (Reference: Title 25, § 71.21.a.4)
	See Act 537 Plan appvd 6/95	13. Discuss the need for and implementation of a sewage management program to assure the future operation and maintenance of existing and proposed sewage facilities through:
	N/A	a. Municipal ownership or other management control over the operation and maintenance of individual on-lot sewage disposal systems, small flow treatment facilities, or other non- municipal treatment facilities. (Reference: Title 25, § 71.21.a.4.iv)
	N/A	b. Requiring scheduled inspection of on-lot sewage disposal systems. (Reference: Title 25, § 71.73.b.1)
	N/A	c. Requiring scheduled maintenance of septic and aerobic treatment tanks and associated system components. (Reference: Title 25, § 71.73.b.2)
	N/A	d. Aggressive enforcement of ordinances which require operation and maintenance and prohibit malfunctioning systems. (Reference: Title 25, § 71.73.b.5)
	N/A	e. Repair, replacement or upgrading of malfunctioning on-lot sewage systems. (Reference: Title 25,§ 71.21.a.4.iv)
	N/A	f. Establishment of joint municipal sewage management programs. (Reference: Title 25, § 71.73.b.8)
	N/A	g. Reduction of organic or hydraulic loading to existing wastewater treatment facilities. (Reference: Title 25, § 71.71)
	N/A	h. Requirements for bonding, escrow accounts, management agencies or associations to assure proper operation and maintenance for non-municipal facilities. (Refer Title 25, § 71.71)
	N/A	14. Non-structural comprehensive planning alternatives that can be undertaken to assist in meeting existing and future sewage disposal needs including. (Reference: Title 25, § 71.21.a.4)
	N/A	a. Modification of existing comprehensive plans involving:
	N/A	1. Land use designations. (Reference: Title 25, § 71.21.a.4)
	N/A	2. Densities. (Reference: Title 25, § 71.21.a.4)
	N/A	3. Municipal ordinances and regulations. (Reference: Title 25, § 71.21.a.4)
	N/A	4. Improved enforcement. (Reference: Title 25, §

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		71.21.a.4)
	N/A	5. Protection of drinking water sources. (Reference: Title 25, § 71.21.a.4)
	N/A	b. Need for a comprehensive plan to assist in producing sound economic and consistent land development. (Reference: Title 25, § 71.21.a.4)
	N/A	c. Alternatives for creating or changing municipal subdivision regulations to assure long-term use of on-site sewage disposal. (Reference: Title 25, § 71.21 .a.4)
	N/A	d. Evaluation of existing local agency programs and the need for technical or administrative training. (Reference: Title 25, § 71.21.a.4)
		VI. The Evaluation of Alternatives
	N/A	**A. Each technically feasible alternative identified in Section V of this checklist must be evaluated for consistency with respect to the foll (Reference: Title25, § 71.21.a.5.i)**
	N/A	1. Applicable plans developed and approved under Sections 4 and 5 of the Clean Streams Law or Section 208 of the Clean Water Act (33 U.S.C.A. 1288). (Reference: Title25, § 71.21.a.5.i.A) B, Section II.A.
	N/A	2. Municipal wasteload management plans developed under PA Code, Title 25, Chapter 94. (Reference: Title25, § 71.21.a.5.i.B) The municipality's recent Wasteload Management (Chapter 94) Reports should be examined to determine if the proposed alternative is consistent with the recommendations and findings of the report. (Appendix B, Section II.B.)
	N/A	3. Plans developed under Title II of the Clean Water Act (33 U.S.C.A. 1281-1299) or Titles 11 and VI of the Water Quality Act of 1987 (33 U.S.C.A. 1251-1376). (Reference: Title25, § 71.21.a.5.i.C) Appendix B, Section II.E.
	N/A	4. Comprehensive plans developed under the Pennsylvania Municipalities Planning Code. (Reference: Title25, § 71.21.a.5.i.D) The municipality's comprehensive plan must be examined to assure that the proposed wastewater disposal alternative is consistent with land use and all other requirements stated in the comprehensive plan. Appendix B, Section 11, D.
	N/A	5. Antidegradation requirements as contained in PA Code, Title 25, Chapters 93, 95 and 102 (relating to water quality standards, wastewater treatment requirements and erosion control) and the Clean Water Act. (Reference: Title25, § 71.21.a.5.i.E) Appendix B, S II,F.
	N/A	6. State water plans developed under the Water Resources Planning Act (42 U.S.C.A 1962-1962 d-18). (Reference: Title25, §

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		71.21.a.5.i.F) Appendix B, Section 11, C.
	N/A	7. Pennsylvania Prime Agricultural Land Policy contained in Title 4 of the Pennsylvania Code, Chapter 7, Subchapter W. Provide on local municipal policy and an overlay map on prime agricultural soi (Reference: Title 25, § 71.21.a.5.i.G) Appendix B Section II.G.
	N/A	8. County Stormwater Management Plans approved by the Department under the Storm Water Management Act (32 P.S. 680.1-680.17). (Reference: Title25, § 71.21.a.5.i.H) Conflicts created by the implementation of the proposed wastewater alternative and the existing recommendations for the management of stormwater in the County Stormwater Management Plan must be evaluated and mitigated. If no plan exists, no conflict exists. Appendix B, Section II.H.
	N/A	9. Wetland Protection under PA Code, Title 25, Chapter 105. Map wetland areas using Federal National Wetlands Inventory Mapping and Soils Mapping. (Reference: Title 25, § 71.21.a.5.i.1) identify and provide mitigative measures for any encroachments on wetlands from the construction or operation of any wastewater facilities proposed by the alternative. Appendix B, Section II.I.
	N/A	10. Protection of rare, endangered or threatened plant and animal species as identified by the Pennsylvania National Diversity Inventory (PNDI). (Reference: Title 25, § 71.21.a.5.i.J) Provide the Department with a copy of the completed Request For PNDI Search document. Also provide a copy of the response letter from the Department's Bureau of Forestry regarding the findings of the PNDI search. Appendix II. J.
	N/A	11. Historical and Archaeological Resource Protection under P.C.S. Title 37, Section 507 relating to cooperation by public officials with the Pennsylvania Historical and Museum Commission. (Reference: Title 25, § 71.21.a.5.i.K) Provide the Department with a completed copy of Form 'A" and its attachments requesting the Bureau of Historic Preservation (BHP) to provide a listing of known historical sites and potential impacts on known archaeological and historical sites. Also provide a copy of the response letter from the BHP. Appendix B. Section II. K.
	N/A	**B. Provide for the resolution of any inconsistencies in any of the points identified in Section VIA. of this checklist by submitting written documentation that the appropriate agency has received, reviewed, and concurred with the method proposed to resolve identified inconsistencies. (Reference: Title25, § 71.21.a.5.ii) Appendix B**
		C. Evaluate each alternative identified in Section V of this

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		checklist with respect to applicable water quality standards, effluent limitations or other technical, legislative or legal requirements. (Reference: Title25, § 71.21.a.5.iii)
	N/A	**D. Provide cost estimates using present worth analysis for construction, financing, ongoing administration, operation and maintenance and user fees for each alternative identified in Section V of this checklist. Estimates shall be limited to areas identified in the plan as needing improved sewage facilities within 5 years from the date of plan submission. (Reference: Title25,§ 71.21.a.5.iv)**
	N/A	**E. Provide an analysis of the funding methods available to finance each of the proposed alternatives evaluated in Section V of this checklist Also provide documentation to demonstrate which alternative and financing scheme combination is the most cost effective; and a contingency financial plan to be used if the preferred method of financing cannot be implemented. The funding analysis shall be limited to areas identified in the plan as needing improved sewage facilities within rive years from the date of the plan submission. (Reference: Title25,§ 71.21.a.5.v)**
	N/A	**F. Analyze the ability of the municipality to implement each alternative proposed in Section V of this report including: (Reference: Title25, § 71.21.a.5.vi)**
	N/A	1. The activities necessary to abate critical public health hazards pending completion of sewage facilities or sewage management programs. (Reference: Title 25, § 71.21.a.5.v.A)
	N/A	2. The phased development of the facilities or sewage management program. (Reference: Title25, § 71.21.a.5.vi.B)
	N/A	a. Provide time schedules for implementing each phase. (Reference: Title25, § 71.21.a.5.vi.C)
	N/A	**3. The administrative organization and legal authority necessary for plan implementation. (Reference: Title25, § 71.21.**
		VII. Institutional Evaluation
	N/A	**A. Provide an analysis of all existing wastewater treatment authorities, their past actions and present performance including:**
	N/A	1. Financial & debt status. (Reference: Title25,§ 71.61.d.2.)
	N/A	2. Available staff and administrative resources. (Reference: Title25, § 71.61.d.2.)
	N/A	3. Existing legal authority to:
	N/A	a. Implement wastewater planning recommendations. (Reference: Title 25, § 71.61.d.2.)
	N/A	b. Implement system-wide operation and maintenance

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		activities. (Reference: Title 25, § 71.61.d.2.)
	N/A	c. Set user fees and take purchasing actions. (Reference: Title25, § 71.61.d.2.)
	N/A	d. Take actions against adopted ordinance violators. (Reference: Title25, §71. 61.d.2.)
	N/A	e. Negotiate agreements with other parties. (Reference: Title25, § 71.61.d.2.)
	N/A	f. Raise capital for construction and operation and maintenance of facilities. (Reference: Title25, § 71.61.d.2.)
	N/A	**B. Provide an analysis and description of the various institutional alternatives necessary to implement the proposed alternative inc**
	N/A	1. Need for new authorities. (Reference: Title25, § 71.61.d.2.)
	N/A	2. Functions of existing and proposed organizations (sewer authorities, etc.). (Reference: Title25,§ 71.61.d.2.)
	N/A	3. Cost of administration, implementability, and the capability of the authority to react to future needs. (Reference: Title25, § 71.61.d.2.)
	N/A	**C. Describe all necessary administrative and legal activities to be completed and adopted to ensure the implementation of the recommended alternative including.**
	N/A	1. All legal authorities of incorporation. (Reference: Title25, § 71.61.d.2.)
	N/A	2. All required ordinances, regulations, standards, and inter-municipal agreements. (Reference: Title25, § 71.61.d.2.)
	N/A	3. Activities to provide rights-of-way, easements, and land transfers. (Reference: Title 25, § 71.61.d.2.)
	N/A	4. Other municipal sewage facilities plan adoptions. (Include the development of Items 1-4 on the project's schedule of implementation). (Reference: Title25, § 71.61.d.2.)
	N/A	5. Any other legal documents. (Reference: Title25, § 71.61.d.2.)
	Vol I, pg 6 Vol II, pg 8	**D. Identify the chosen institutional alternative for implementing the chosen wastewater disposal alternative. Provide justification for choosing the specific alternative. (Reference: Title25, § 71.61.d.2.)**
	N/A	**VIII. Selected Wastewater Treatment & Institutional Alternatives**
	N/A	**A. Select one technical wastewater disposal alternative which best meets the wastewater treatment needs of each area of the municipality studied. Justify the choices by providing documentation which shows that they are the best alternatives) based on:**
	N/A	1. Wastewater disposal needs. (Reference: Title25, § 71.21. a.6.)
	N/A	2. Technical and administrative needs. (Reference: Title25,

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		Section 71.21.a.6.)
	N/A	3. Cost-effectiveness. (Reference: Title25,§ 71.21.a.6.)
	N/A	4. Management and administration systems available. (Reference: Title25, § 71.21.a.6.)
	N/A	5. Financing methods available. (Reference: Title 25, § 71.21. a.6.)
	N/A	6. 5 and 10 year planned growth areas. (Reference: Title 25, § 71.21.a.6.)
	N/A	7. Environmental soundness and compliance with natural resource planning and preservation programs. (Reference: Title 25, § 71.21.a.6.)
	N/A	**B. Describe the capital financing plan chosen to implement the selected alternative(s).**

SUPPORTING DOCUMENTS

Daily Local 12/3/96

Westtown Sewer to be taken over

By BILL THOMPSON
Special to the Local News

WESTTOWN — Supervisors have announced what can be considered a Christmas present to some residents but may prove a headache for the board.

The township will be in the sewage disposal business effective Dec. 15.

The township will take over the operation of the privately owned Westtown Sewer Company, as ordered by the courts on Oct. 15.

In the interim, the sewer company's owner, Peter DeFeo, appealed the decision in a protective appeal, which, according to township Secretary/Treasurer Evelyn Groff, does not stay the order to take over the plant.

The effect facing the board is primarily a financial one. It has already affected the final resolution of the 1997 budget.

"The impact at this time is a large unknown, and there is a lot of work to be done by the board in the immediate future," said Groff.

As far as the operation is concerned, Groff noted that the first decision is whether or not to keep the present operator, American Commonwealth, which has a contract with DeFeo to operate the facility until April.

"The board has had discussions with American, but has not yet reached a decision," said Groff.

"One major item which should be made known to all of DeFeo's customers is that the township will be collecting all bills as of the 15th.

"A number of steps were outlined by the court, which must be completed by various deadlines, including a plan to upgrade and increase plant capacity," she said.

Groff summarized by saying the board will start to pursue the various objectives as ordered.

The board has until the end of the year to approve 1997 budget.

As had been decided earlier, sewer rates will be increased.

The takeover order is the result of a suit by the state Department of Environmental Protection against the township and the sewer company to resolve the plant's many operating problems.

The action did not mean that the township was at fault, but it was the only way for the DEP to guarantee responsibility for the plant.

In other business, Groff noted that the board had filed an appeal of the recent zoning hearing board decision granting various exceptions and variances to Amoco Corporation in its proposed multipurpose site at Route 3, old Routo 352, and Route 352.

One condition of approval was the barring of pedestrian or vehicle access to old Route 352 from the site.

The board's appeal asks that such a one-way access be required, subject to approval by the Pennsylvania Department of Transportation.

SUPPORTING DOCUMENTS

ADDENDUM TO SECTION 4.6
SPRAY IRRIGATION ALTERNATIVE FOR
RIDLEY CREEK STP

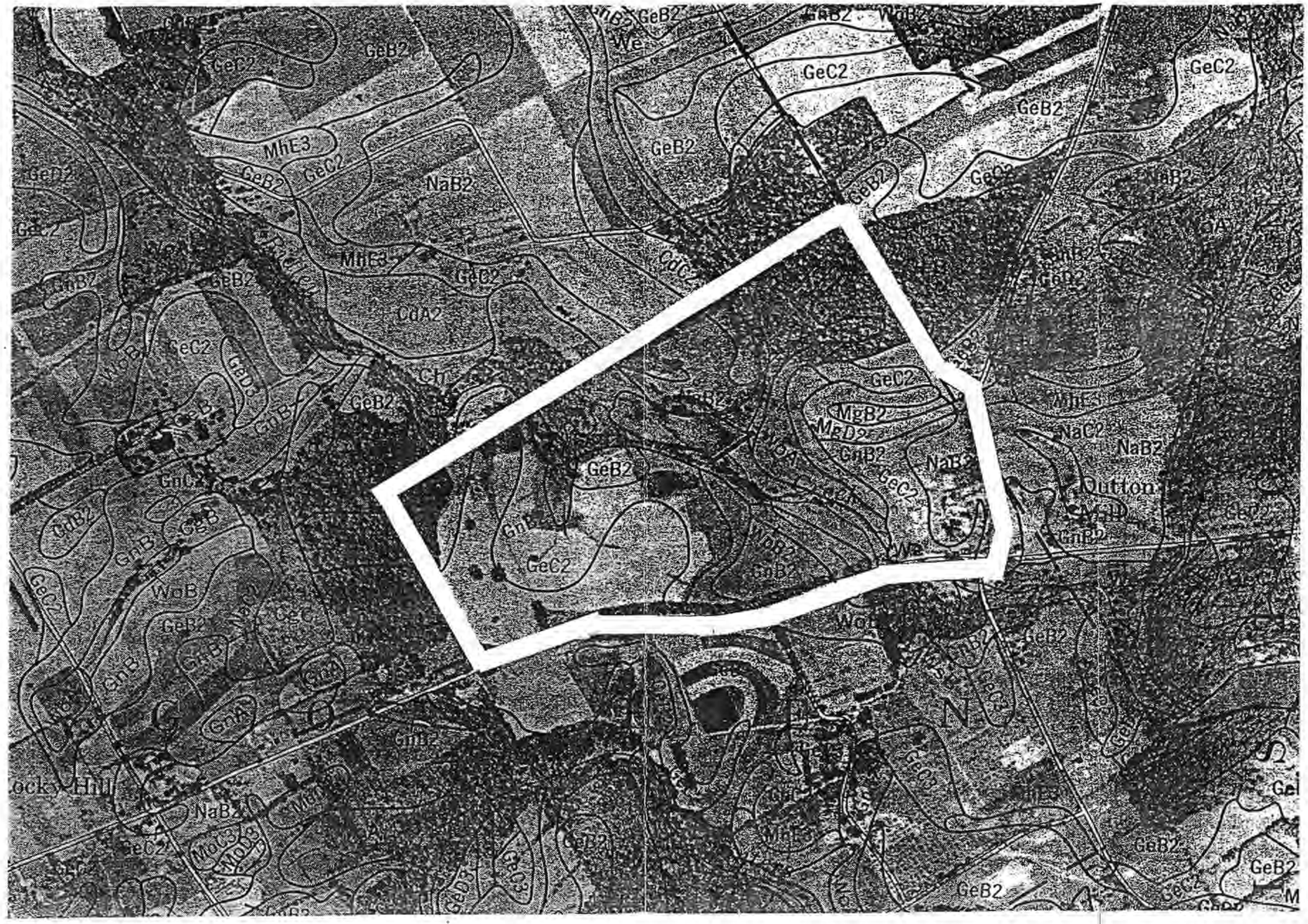
The December 1992 Final Draft for the Act 537 Plan Update was distributed to each adjacent municipality and to the County reviewing agencies during February 1993. The Chester County Planning Commission review as well as the Chester County Health Department review and the Willistown Township letter of comments all encouraged the possible use of a spray irrigation alternative for the estimated 300,000 gallons per day (gpd) in additional wastewater effluent projected for the Ridley Creek STP. The Township has investigated the possibility of the use of spray irrigation techniques with the following summary results.

Table 6.1 as contained on page 6-2 of Section 6.0 of this report clearly establishes an ultimate need for 670,299 gpd for potential wastewater treatment needs at the Ridley Creek plant. When the additional 132,700 gpd requested by Immaculata College is added, the actual anticipated wastewater flow under current plan update conditions would be approximately 740,000 gpd. For future design and discussion purposes only, a figure of 300,000 gpd has been utilized in this Plan Update as the need for expansion of treatment availability at the Ridley Creek STP.

Since a good part of the infrastructure and collection system is already in place for treatment at the Ridley Creek STP, it is logical to assume continued use of the expanded collection system and treatment at the STP. Other sections of this report discuss the viability of use of the A/O system as a means of expanding the current treatment capability from 400,000 gpd to 700,000 gpd. This option would continue to be utilized under a spray irrigation alternative at an estimated cost of $1,200,000 for the STP upgrading.

In lieu of stream discharge into Ridley Creek for the additional 300,000 gpd, a potential alternative would be to acquire nearby property, if available, for spray irrigation purposes.

Only two properties exist within the Ridley Creek watershed which contain sufficient acreage to handle the facilities and spray fields necessary for the discharge of 0.3 MGD. These include the SmithKline Beecham property located north of Boot Road and the additional possibility of use of all or part of the Grace Estate property located immediately adjacent to and south of the Ridley Creek STP.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SmithKline Beecham (herein Beecham) currently owns 312 acres bounded by Paoli Pike, Boot Road, and Township Line Road. In August 1991, Beecham presented to the Township a Sewage Facilities Planning and Environmental Site Analysis for Land Application of Wastewater Effluent based on a proposed development of the entire site. The Land Development Plan that accompanied the Sewage Facilities Study was withdrawn. However, Sewage Facilities Study remains a valuable tool in the evaluation of the tract of land. Figure 13 contained in this study shows the proposed land application areas and winter storage lagoons for a spray irrigation alternative. This carefully prepared study documents by way of percolation tests and soil profiles the areas within the site which are suitable for spray irrigation. Such areas are depicted in Figure A-1 of the Beecham report. According to the report, Beecham could handle its ultimate wastewater generated on the site by using the effluent spray areas and the winter storage ponds depicted on Figure 13.

The Township recently reached a settlement with Beecham for the rezoning and future use of this tract for combined residential or office park purposes. The centroid of the Beecham effluent spray areas is located 1.1 miles north of the Ridley Creek STP. A pumping station located at the Ridley Creek STP conveying treated effluent 1.1 miles north to the Beecham property could never be cost-effective, particularly in view of the assumed necessary condemnation of approximately 75 acres of suitable effluent spray area and storage pond area. Therefore, the use of the Beecham property for future spray irrigation purposes is dismissed as a possible alternative because of the need to pump treated effluent more than 1.1 miles and the high expected cost of condemnation per acre (assumed to be in excess of $60,000 per acre) in addition to the burden of exceptionally high operating costs for future years.

Grace Estate

The Grace Estate property, comprising 182 acres, is located immediately south of the Ridley Creek STP and is bounded on the south by East Strasburg Road and on the east by Township Line Road. The site is currently undeveloped. It is possible that the entirety of this adjacent property (or major portions thereof) could be suitable for spray effluent areas. The attached exhibit depicting the soils for the entirety of the Grace Estate property is shown on the following page as Exhibit 4-4. The soils paralleling Ridley Creek are predominately Worsham series and Wehadkee series with Glenville silt loam and Glenelg silt loam occupying substantial portions of the property to the west of Ridley Creek. It is estimated that it would be necessary to acquire the entire westerly half of this property (west of Ridley Creek) and perhaps suitable portions of

the property east of Ridley Creek in order to meet the estimated physical area needs of 75 acres required for application of spray effluent for an additional 300,000 gpd.

The Township believes that the acquisition of any portion of this property would most likely involve condemnation procedures. The best available estimate is that this property would carry an approximate raw land value of $55,000 per acre since acquisition of these major portions of the site would destroy the utility of the balance of the site. Thus, the estimated cost for acquiring approximately 75 acres of the Grace Estate parcel would involve a cost of approximately $4,125,000 and possible additional consequential damages to the balance of the site.

Spray Irrigation Alternative Spatial Needs

The following alternative design assumptions have been utilized in determining the physical or spatial needs for spray field effluent involving 300,000 gpd. Assuming that soil testing would allow the discharge of the above amounts, the following data is relevant.

Land Area Required

- One inch of effluent/week equals 77.3 acres plus buffer and storage pond
- One and one-half inches of effluent/week equals 51.5 acres plus buffer and storage pond
- Three quarters of an inch of effluent/week equals 103.1 acres plus buffer and storage pond

Several design alternatives for an assumed required need for a 60-day winter storage pond are indicated below.

- Eight-foot deep pond equals 9 acres including slope limits
- Six-foot deep pond equals 12.2 acres including slope limits
- Ten-foot deep pond equals 7 acres including slope limits

An average 8-foot depth of pond was assumed for this design alternative. A 1-1/2-inch per week effluent application rate was selected (assuming this is possible) which would require 51.5 acres of spray field area plus a required 100-foot nominal buffer comprising 14.6 acres or a total of 66 acres for spray effluent use. When combined with the 9 acres required for a 60-day storage pond at a average depth of 8 feet, the resulting

required land area is 75 acres. Assuming that 75 acres represents the physical land area requirement at an average price of $55,000 per acre, this would result in an estimated $4,125,00 in costs. Under the Chester County Spray Irrigation Grant Program, utilizing Chester County Open-Space funding, the Township might be entitled to a maximum grant of $600,000 since multiple municipality involvement is anticipated.

Thus, the net cost of $3,525,000 plus an additional $400,000 of estimated cost for the spray field piping and pumping system, plus the $1,200,000 in estimated cost for expansion of the treatment plant would bring the total cost for this alternative to $5,125,000. When equated to the 300,000 gpd of anticipated new wastewater effluent, this results in an estimated cost in excess of $17 per gallon of wastewater treated as compared with the estimated $4.50 per gallon for expanding the STP and allowing stream discharge to Ridley Creek.

It is the Township's position that this spray irrigation alternative, under the above assumed conditions, is not a viable alternative from the initial cost factors and in view of the possibility that the land cost listed above could be higher (based on consequential damages).

SUPPORTING DOCUMENTS

1996 CHAPTER 94
MUNICIPAL WASTELOAD MANAGEMENT REPORT
RIDLEY CREEK WASTEWATER TREATMENT PLANT
EAST GOSHEN TOWNSHIP, CHESTER COUNTY

Prepared For:

East Goshen Municipal Authority
East Goshen Township, Chester County
1580 Paoli Pike
West Chester, Pennsylvania 19380
610-692-7171

Prepared By:

Yerkes Associates, Inc.
Authority Engineer
1444 Phoenixville Pike
P.O. Box 1568
West Chester, Pennsylvania 19380-0078
610-644-4254

Date: March 10, 1997

ITEM 1 - HYDRAULIC AND ORGANIC LOADING CONTRIBUTION

The total number of Equivalent Dwelling Units (EDU's) connected at the end of 1996 was 1,165. They contributed an average daily flow of 309,937 gallons per day (gpd). The past year was unusually wet from snow and rain, raising groundwater levels to new records. Based on that information and the Treatment Plant Operator's reports of faulty meter readings, we have taken the average daily flow and subtracted what we feel is I/I to come up with an actual flow of 275,451 gpd. That number is used for all projections in this report.

The number of Equivalent Dwelling Units was derived in the following manner:
The total average water usage from nonresidential users plus the 384 New Kent Apartments units is 105,678 gpd (38,904 gpd + 66,674 gpd), based on actual water meter readings provided from the Philadelphia Suburban Water Company. It is estimated that 85% of water used is returned as wastewater. Subtracting 85% of the water usage (89,826 gpd) from the actual average daily flow of 275,451 represents the total average daily flow from the single residential users. This result (169,673 gpd), is then divided by 825, the actual number of single residential connections, for the average flow per single residential connection. The average flow per residential connection for this system is approximately 205 gpd, which defines the volume of an EDU of the system. The total number of EDU's of the system is determined by dividing the average daily flow by 205gpd. However, in accordance with the Township Act 537 Plan, 275 gpd /EDU will be used for estimated future flows.

The following table lists the actual average monthly flows and estimated organic load for 1996

Table 1

MONTH	FLOW (average GPD)	BOD LOAD (ppd)
JAN	305,358	531
FEB	299,824	522
MARCH	312,668	544
APRIL	327,320	570
MAY	302,161	526
JUNE	309,160	538
JULY	292,122	508
AUGUST	289,858	504
SEPTEMBER	304,057	529
OCTOBER	313,907	546
NOVEMBER	258,003	449
DECEMBER	**404,808**	**704**
ACTUAL FLOW	309,937	539
MINUS I/I	-34,486	
BASE FLOW	275,451	

Three Month Maximum (3MM) average flow is 314,050 gpd and the Peak Organic load is 704 ppd.

The monthly average flows are based on the total gallons treated as recorded by the flow meter at the plant effluent divided by the number of days in the month. The flows in **Shaded** type in Table 1 are the flows that have been averaged together for the 3MM flow. The 3MM is the calculated hydraulic load. The permitted hydraulic load is 400,000 gpd.

The Peak Organic load or the BOD load is estimated by using influent data from a 24 hour composite sample taken once monthly and analyzed for CBOD. The ratio of BOD and CBOD is assumed to be 1:2. The monthly samples were combined for an annual average influent BOD concentration of 208.5 mg/l. The estimated monthly organic loading is determined by the following: Monthly Average Flow in million gallons per day (mgd) times 208.5 mg/l times 8.345 pounds per million gallons per mg/l. The Peak Organic load is the highest monthly load for the calendar year and is presented in **Shaded** type in Table 1. The plant was designed to treat an organic load of 830

pounds per day (ppd), however there is no permit limit on the maximum organic load nor have any studies been performed to determined the plant's actual "As-built" efficiency.

During the next five (5) years, the number of EDU's is projected to increase. Projected peak loads for future years is calculated by multiplying the historical average ratio of the 3MM over the annual average flow times the projected load for that year. Hydraulic peak load ratio (last year's 3MM 295,731 gpd + this year's 3MM 314,050 gpd)/(last year's average 271,171 gpd + this year's average 275,451 gpd) = 1.08. Organic peak load ratio (last year's peak 568 ppd + this year's peak 704/last year's average 472 ppd + this year's average 462 ppd) = 1.15. The following chart uses 275 gpd/EDU for future connections in accordance with the Township's current Act 537 Plan. Also, an allowance of 25,000 gpd for inflow and infiltration is added to the current year base flow has been added.

TABLE 2

1996 Base Flow in GPD + 25,000 gal = 300,451

YEAR	ADDITIONAL # EDUs	ADDITIONAL ESTIMATED FLOW at 275 gpd	TOTAL ESTIMATED AVG FLOW	TOTAL ESTIMATED PEAK FLOW (gpd) (AVG X 1.08)
1997	62	17,050	317,501	342,901
1998	61	16,775	334,276	361,018
1999	55	15,125	349,401	377,353
2000	24	6,600	356,001	384,481
2001	6	1,650	357,651	386,263
2002	6	1,650	359,301	388,045

As can be seen in Table 2, after the year 2000 there is potential to exceed the permitted hydraulic loading of the treatment plant when using 275 gpd/EDU for future flows. The current average flow per residential unit is approximately 225 gpd however we feel it is much higher than previously recorded flows due to the unusually wet year and the numerous leaks discovered by the Public Works Department. We will continue to use 225 gpd for planning. The flow figure of 225 gpd has been approved for use for planning, using a per capita flow figure of 75 gpd with an average of 3 persons per dwelling. Using the proposed revised flow figure of 225 gpd the following may be expected.

TABLE 3

1996 BASE FLOW OF 275,451 +
25,000 GPD for I/I ALLOWANCE = 300,451

YEAR	ADDITIONAL # EDUs	ADDITIONAL ESTIMATED FLOW AT 275 GPD	PROJECTED ANNUAL AVG HYDRAULIC LOADING	TOTAL ESTIMATED PEAK FLOW (AVG X 1.08)
1996			300,451	338,421
1997	62	13,950	314,401	339,553
1998	61	13,725	328,126	354,376
1999	55	12,375	340,501	367,741
2000	24	5,400	345,901	373,573
2001	6	1,350	347,251	375,031
2002	6	1,350	348,601	376,489

The estimated average organic load, in pound per day (ppd) is calculated by multiplying estimated average flows, in mgd, from Table 2 times 208.5 mg/l times 8.345 pounds/mgals/mg/l. The estimated peak organic load is 1.15 times estimated average organic load.

The increase in the number of connections was derived in the following manner using 275 gpd per EDU:

Actual connections for 1996:

Authority Sponsored Projects (1996)		
The Lane	6 EDU	
Miscellaneous	6 EDU	
Existing Subdivisions		
Willow Pond	28 EDU	(Includes lots in Willistown Twp.)
Land Developments in progress		
Clocktower (Bow Tree Ph4)	31 EDU	
Oakwood	4 EDU	
Wood Estate	2 EDU	
Total for 1996	**77 EDU**	**21,175 gpd**

Projected connections for 1997:

Authority Sponsored Projects (1997)		
None	0 EDU	
Land Developments in progress		
Clocktower	31 EDU	
Oakwood	6 EDU	
Wood Estate	21 EDU	
Total for 1997	**62 EDU**	**17,050 gpd**

Projected connections for 1998:

Authority Sponsored Projects (1998)		
None	0 EDU	
Land Developments in progress		
Miscellaneous	4 EDU	
Clocktower	31 EDU	
Oakwood	6 EDU	
Wood Estate	20 EDU	
Total for 1998	**61 EDU**	**16,775 gpd**

Projected connections for 1999:

Authority Sponsored Projects (1999)		
None	0 EDU	
Land Developments in progress		
Miscellaneous	4 EDU	
Clocktower	31 EDU	
Wood Estate (complete)	20 EDU	
Total for 1999	**55 EDU**	**15,125 gpd**

Projected connections for 2000:

Miscellaneous	6 EDU	
Clocktower	18 EDU	
Total for 2000	**24 EDU**	**6,600 gpd**
Total for 2001	**6 EDU**	**1,650 gpd**
Total for 2002	**6 EDU**	**1,650 gpd**

Over the past year there was a marked increase in flow due to an extremely wet year causing I/I. The entire system was televised, during which several leaks were discovered and repaired. A large break occurred in the line for the Pfizer property and was the responsibility of the owner to repair. The repair was not made until December, 1996. The Sewer Operating Budget contains $25,500 for maintenance and repairs; an allowance of 25,000 gpd is included in the projected flow estimates.

ITEM 2 - PLAN TO REDUCE OVERLOADS

In the event that Item I flows exceed the allocated or permitted capacity, a plan would be required to indicate what action would be anticipated to relieve this condition. In fact, the Township is currently preparing a Revised Act 537 of the Special Study Area of the Ridley Creek Sewage Treatment for an expansion of the RCSTP to .750 MGD in two phases. The first phase would be to 0.500 MGD and the second phase when needed. The expansion is being pursued because additional capacity at the West Goshen Treatment Plant is not economically feasible and because treatment costs in the Ridley Creek system are lower than the Chester Creek system. Until the RCSTP expansion is approved by the Department, the system will continue to be monitored and televised as necessary to control any I/I. Residents will again be advised that lateral

caps need to be in place and the connection of sump pumps to the public system is prohibited.

ITEM 3 - SEWER EXTENSIONS

During 1996, a total of 6 EDUs were added to the system as a municipal sponsored project. There are no planned municipal projects for the coming years.

ITEM 4 - OPERATING AND MAINTENANCE PROGRAM

A discussion of the practices employed for monitoring, maintaining and inspecting the sewerage system follows. Of particular interest may be the procedures for emergency maintenance, as well as the methods used to detect and remedy excess infiltration and inflow. A description of routine and preventative maintenance programs is given as well as the number of maintenance employees and their availability and effectiveness in the event of a system malfunction is also discussed.

East Goshen Township has engaged the services of TMH Environmental Services Inc. to operate the treatment plant. This contract includes daily maintenance, recording data and submitting all reports to the Township that are required under N.P.D.E.S. Permit No. Pa-0050504.

Although there are presently no industrial waste contributors on system, the Township's Ordinance #95 addresses the strength of industrial waste and permits only discharges of domestic strength.

The treatment plant alarm system is tied into an auto dialer which has the ability to dial five (5) numbers in succession. It begins with treatment operator and ends with the Township Maintenance staff.

The Township constantly monitors daily influent flow readings and monitors daily rainfall with a rain gauge located at the Township building. Should daily flows increase Township staff then would inspect the system for leaks. All sewer lines are routinely cleaned and inspected by Television cameras. The Township, during billing to the users, reminds the users against discharging sump pumps into the sewer system.

Of the Township's Maintenance staff, the Township has approximately eight (8) people along with sundry equipment, all of which can be made available under emergency conditions. The Authority has retained the services of Yerkes Associates, Inc. an engineering consulting firm that has a staff of professional engineers and certified treatment operators should technical assistance be needed.

ITEM 5 - CONDITION OF EXISTING SYSTEM

A discussion of the overall condition of the system with emphasis on any plans to upgrade, repair or rehabilitate the system follows:

The system was installed in 1985 in accordance with Township Specifications and under professional inspection and surveillance of the Authority's Engineer. All of the lines were air tested and lamped and are in excellent condition. Until 1996, there was practically no I/I. The past year (1996) was one of record snow and rain fall bringing groundwater levels to record highs. These high levels caused homes, which are normally dry, to have water problems that they would not normally have. We feel that more sump pumps were installed and probably connected to the sewer lines because it was impossible to direct the flow otherwise due to the heavy snows on the ground for the majority of the winter. In addition, high levels probably caused some infiltration into manholes that normal conditions would not. Based on flow records from the past five years, we estimate that sump pumps and I/I contributed 34,486 gpd.

ITEM 6 - PUMPING STATIONS

There is one pumping station in the system.

	STATION 1
RATED MAXIMUM DAILY CAPACITY	25,000; 71 HOMES (HUNT COUNTRY)
CURRENT MAXIMUM DAILY FLOW	19,525
MAXIMUM DAILY FLOW WHEN AREA SERVED BY THE PUMP STATION IS FULLY DEVELOPED	19,525
TWO YEAR MAXIMUM DAILY FLOW	SAME AS MAXIMUM
CURRENT AVERAGE DAILY FLOW:	19,525 GPD; BASED ON 71 HOMES AT 275 GPD
PEAK INSTANTANEOUS FLOW DURING WET WEATHER	APPROXIMATELY SAME AS

MAXIMUM

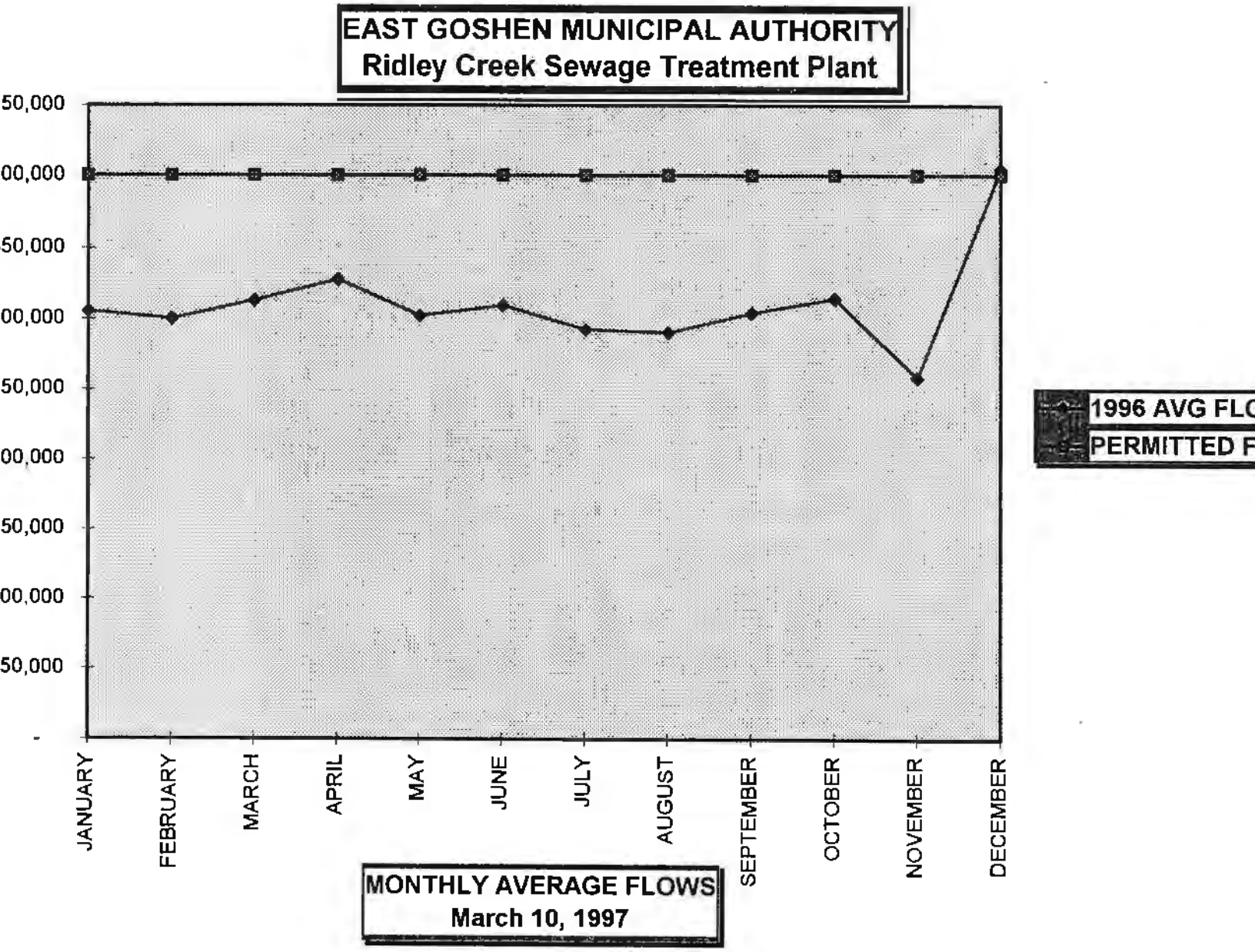
ITEM 7 - AMENDMENTS TO THE SEWER ORDINANCE

No amendments to the Sewer Ordinance this year.

ITEM 8 - GRAPHS

Attached to this report are the following graphs:

Monthly Average Flows
Monthly Average Organic Loading
Projected Hydraulic Loading
Projected Organic Loading
Four Year History of Flows (1992 - 1995)


EAST GOSHEN MUNICIPAL AUTHORITY
Ridley Creek Sewage Treatment Plant
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50,000
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50,000
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50,000
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FEBRUARY
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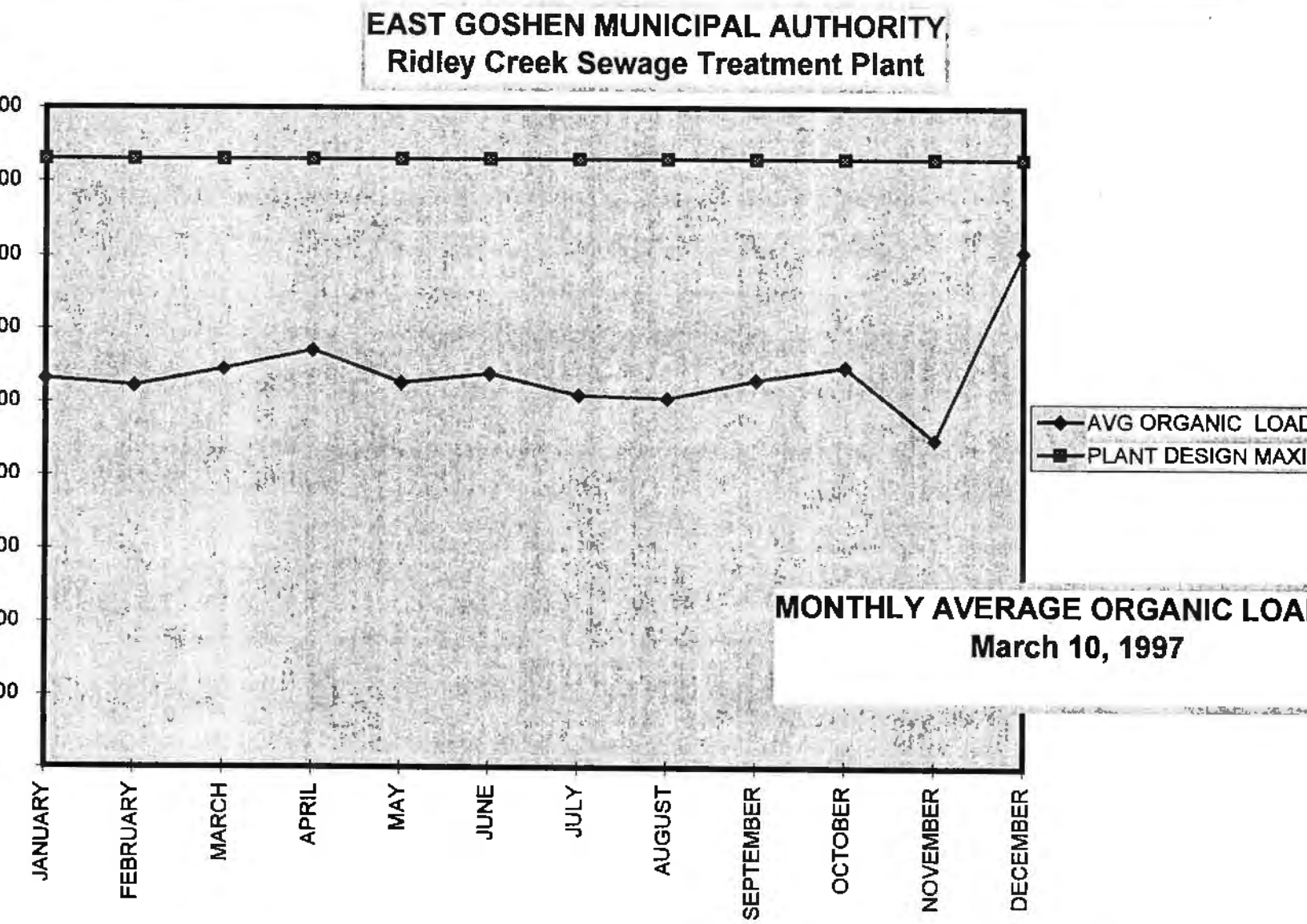
1996 AVG FLO
PERMITTED F
MONTHLY AVERAGE FLOWS
March 10, 1997


EAST GOSHEN MUNICIPAL AUTHORITY
Ridley Creek Sewage Treatment Plant
AVG ORGANIC LOAD
PLANT DESIGN MAXI
MONTHLY AVERAGE ORGANIC LOA
March 10, 1997
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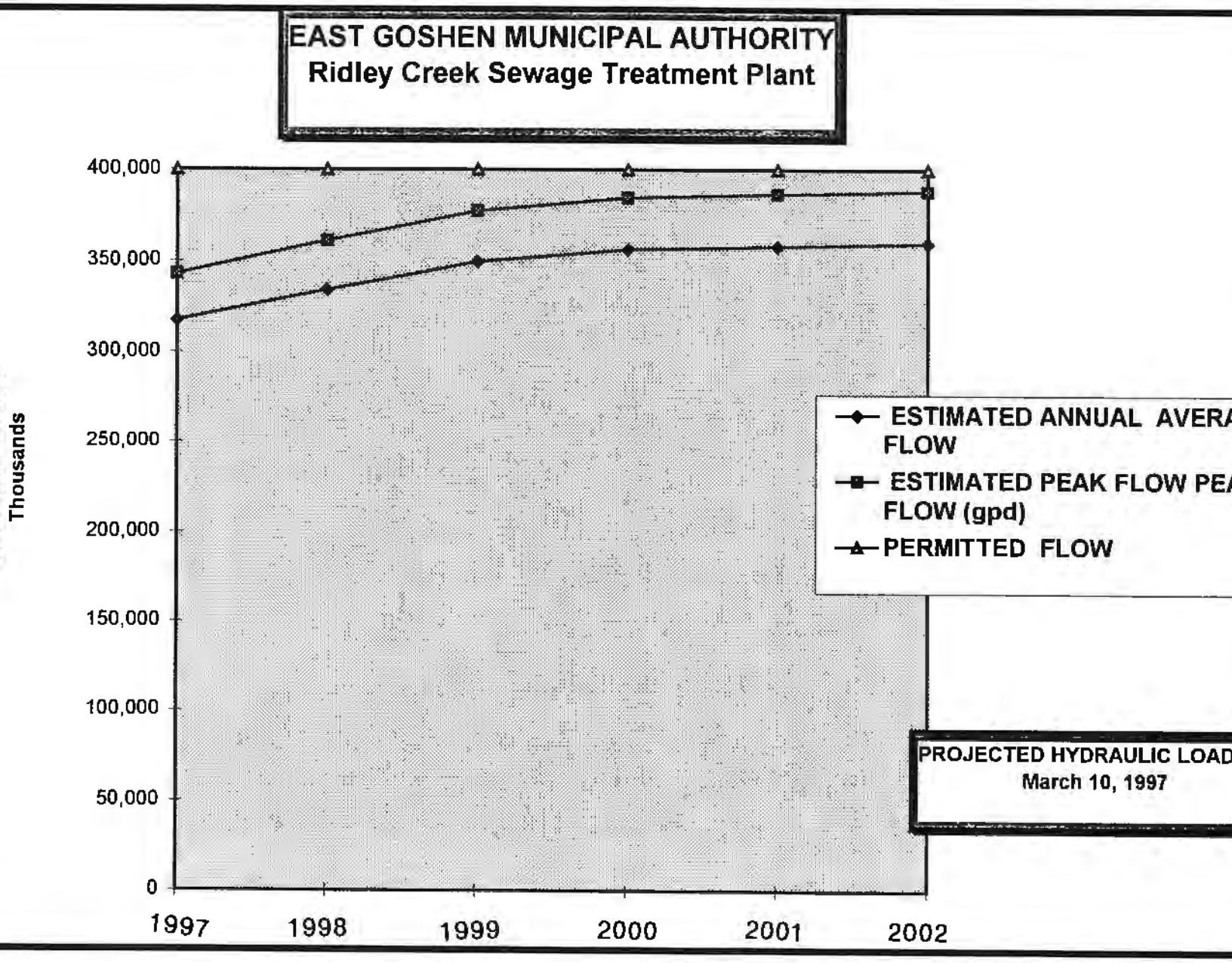
EAST GOSHEN MUNICIPAL AUTHORITY
Ridley Creek Sewage Treatment Plant
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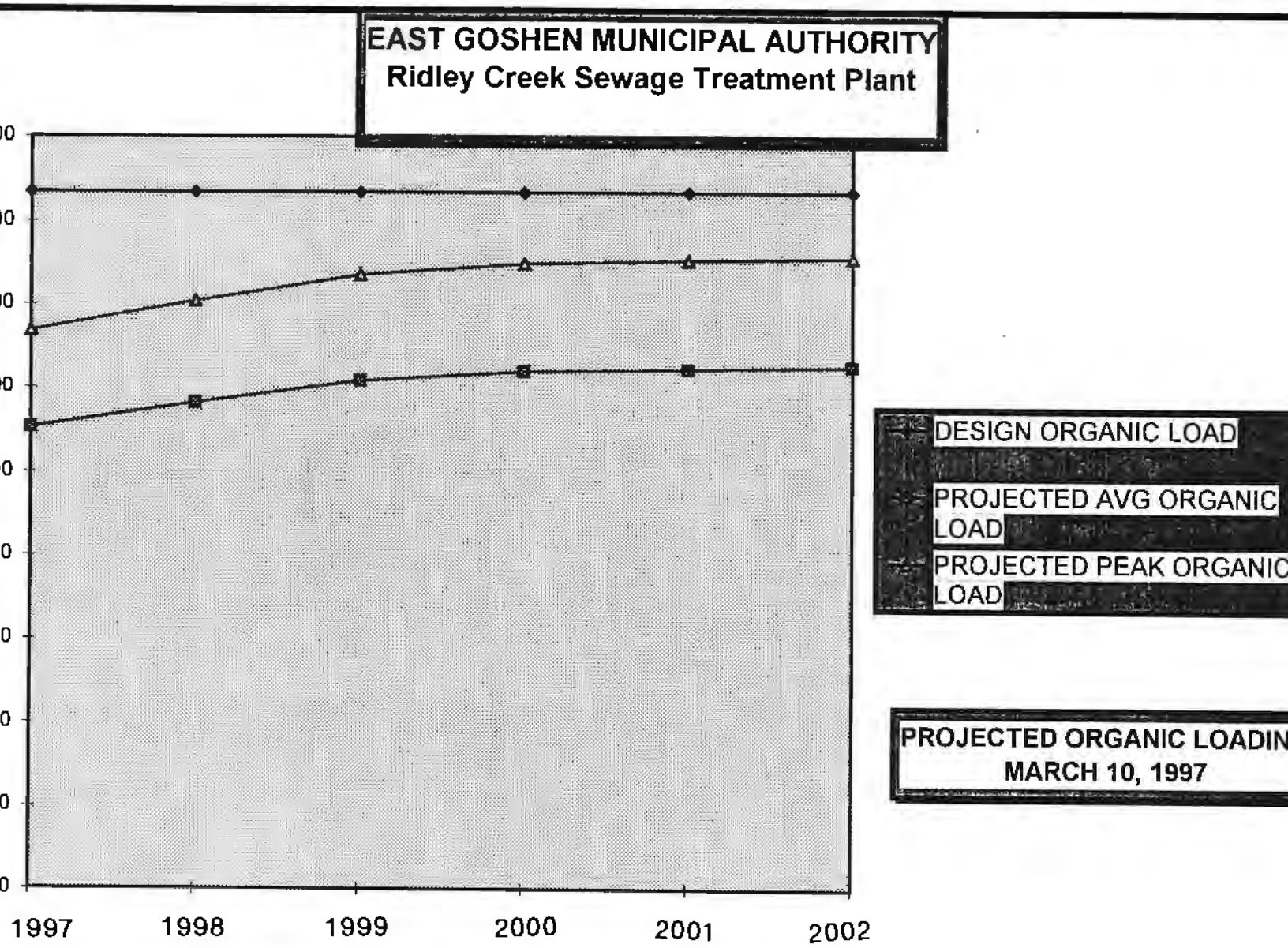
250,000
200,000
150,000
100,000
50,000
0
Thousands
1997
1998
1999
2000
2001
2002
ESTIMATED ANNUAL AVERA
FLOW
ESTIMATED PEAK FLOW PEA
FLOW (gpd)
PERMITTED FLOW
PROJECTED HYDRAULIC LOAD
March 10, 1997


EAST GOSHEN MUNICIPAL AUTHORITY
Ridley Creek Sewage Treatment Plant
1997
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PROJECTED AVG ORGANIC LOAD
PROJECTED PEAK ORGANIC LOAD
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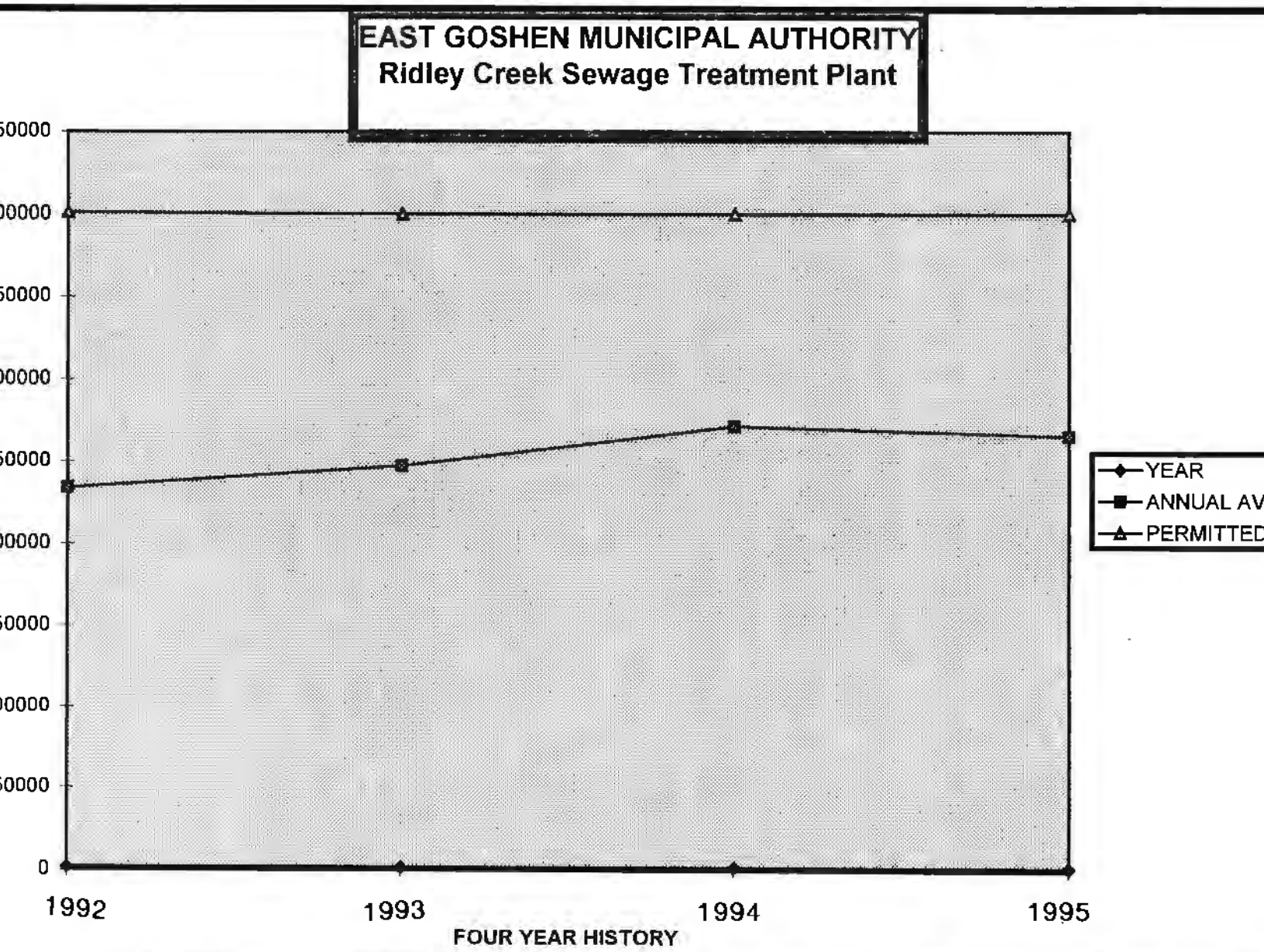
MARCH 10, 1997


EAST GOSHEN MUNICIPAL AUTHORITY
Ridley Creek Sewage Treatment Plant
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1992
1993
1994
1995
FOUR YEAR HISTORY
YEAR
ANNUAL AV
PERMITTED

August, 1997

EAST GOSHEN TOWNSHIP
SUMMARY OF WATER USAGE

STREET	# SFD	AVG GPD
DICKENS DR	4	181
ALCOTT CIR	5	173
CLOCKTOWER DR	17	187
PEACH TREE DR	10	415
JAMESTOWN WAY	8	287
AVG GPD	44	249
returned wastewater (85%) =		211 gpd

Information obtained from Utility Municipal Services

EAST GOSHEN TOWNSHIP

VATER USAGE 1997

ion supplied by Utility & Municipal Services - billing service for
phia Suburban Water Co. (PSW CO)
s are single family of at least 3,000 SF in size & built within the past 5 years

ENS DR	GPD
1100	NEW
1101	204
1102	NEW
1103	181
1104	NEW
1105	134
1107	206
1109	NEW
1110	NEW
G GPD	181

ALCOTT CIR	GPD
1605	247
1606	100
1607	150
1608	216
1610	150
AVG GPD	173

JAMESTOWN WAY	GPD
703	349
705	196
706	303
707	216
708	521
709	129
711	115
713	468
AVG GPD	287

TOWER FARMS

TOWER DR	GPD
1702	178
1704	NEW
1705	NEW
1707	110
1708	228
1709	385
1710	190
1711	298
1712	492
1713	418
1714	388
TAL	2687

CLOCKTOWER DR	GPD
1715	280
1716	518
1717	218
1718	123
1719	243
1720	190
1724	
1726	
1727	141
1730	187
SUB TOTAL	1900
AVG GPD	270

PEACH TREE	GPD
713	598
717	
719	443
721	279
723	667
725	419
726	426
728	344
730	316
732	262
734	391
AVG GPD	415

DETAIL

STREET	HOUSE #	RDG #1	RDG #2	# OF DAYS	GPD
DICKENS DR	1101	519	160	254	141
	1105	168		125	134
	1107	479	120	180	199
ALCOTT CIRCLE	1605	406		155	262
	1606	899	475	145	292
	1607	720	535	123	150
	1608	224	8	67	322
	1610	569	384	123	150
CLOCKTOWER DR	1702	438		246	178
	1705	1175	1093	21	390
	1707	322	150	125	138
	1708	612	254	157	228
	1709	1065	461	157	385
	1710	203		107	190
	1711	889	421	157	298
	1714	1031	421	157	389
	1715	1423	1174	86	290
	1717	1258	1016	111	218
	1718	665	533	107	123
	1719	629	515	47	243
	1720	448	285	86	190
	1727	280		198	141
	1730	251	0	131	192
	721	380	140	87	276
	728	722	0	210	344
	730	489	217	86	316
	732	389	164	86	262
	734	383	0	98	391
JAMESTOWN WAY	703	767	334	125	346
	705	504	304	102	196
	706	784	687	32	303
	707	990	828	75	216
	709	578	467	86	129
	711	1086	1054	28	114
	713	554	277	86	322
	AVERAGE GPD				242
	WASTEWATER RETURN OF 85%				205