Borough of Chambersburg
Franklin County, Pennsylvania

Act 537
Sewage Facilities Plan Update

Original: April 2009
Revised: October 2010

BUCHART HORN, INC.

Strengthening Communities

Buchart Horn, Inc.
445 West Philadelphia Street, York, PA 17401
(717) 852-1400 • www.bh-ba.com

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PART 1 GENERAL INFORMATION

A. Project Information

1. Project Name Borough of Chambersburg Act 537 Sewage Facilities Plan Update

2. Brief Project Description The purpose of this Plan is to project future flow rates to the existing Chambersburg WWTP and to analyze alternatives for upgrading the WWTP to meeting pending Total Phosphorous and Total Nitrogen effluent loading caps.

B. Client (Municipality) Information

Municipality Name	County	City	Boro	Twp
Borough of Chambersburg	Franklin	☐	☒	☐

Municipality Contact Individual - Last Name	First Name	MI	Suffix	Title
Stonehill	Jeffrey			Borough Manager
Additional Individual Last Name	First Name	MI	Suffix	Title

Municipality Mailing Address Line 1	Mailing Address Line 2
100 South Second Street	

Address Last Line -- City	State	ZIP+4
Chambersburg	PA	17201

Phone + Ext.	FAX (optional)	Email (optional)
(717) 261-3237		

C. Site Information

Site (or Project) Name	
Chambersburg WWTP	Borough of Chambersburg Act 537 Plan

Site Location Line 1	Site Location Line 2

D. Project Consultant Information

Last Name	First Name	MI	Suffix
Schober	Michael	A	P.E.

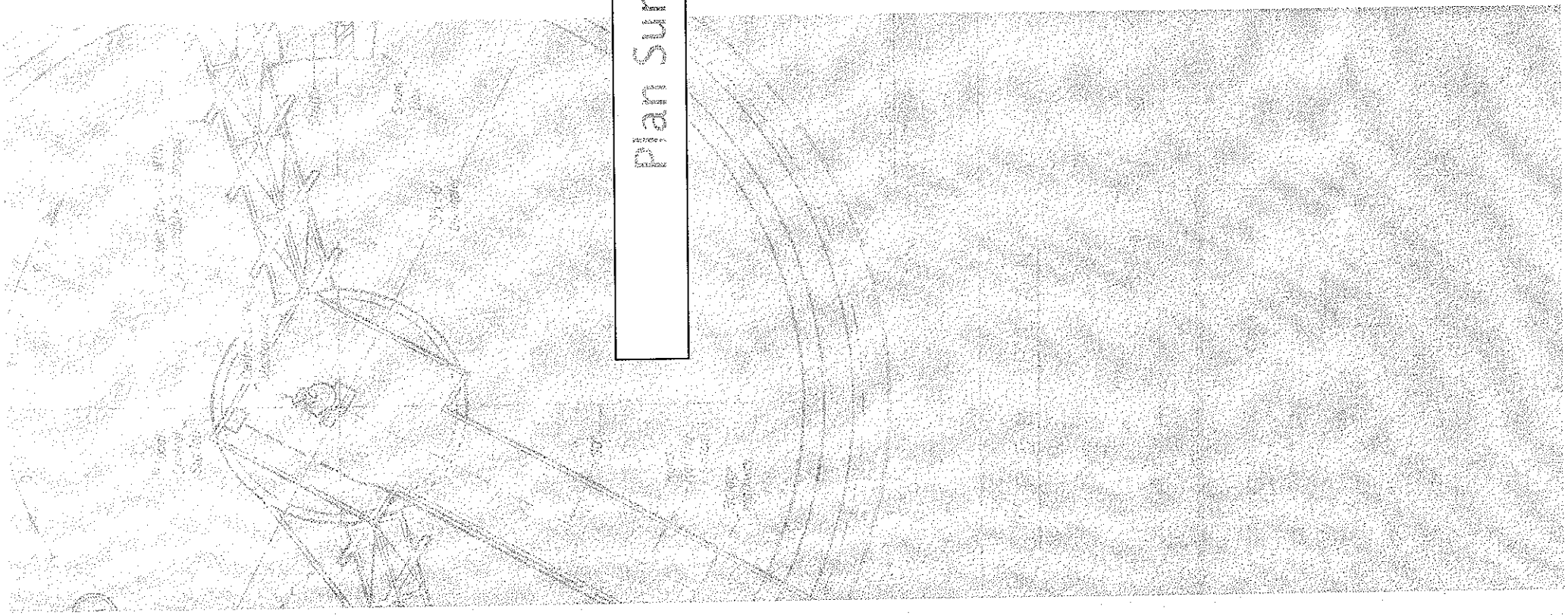
Title	Consulting Firm Name
Sr. Vice President	Buchart Horn, Inc.

Mailing Address Line 1	Mailing Address Line 2
445 West Philadelphia Street	

Address Last Line – City	State	ZIP+4	Country
York	PA	17401	USA

Email	Phone + Ext.	FAX
mschober@bh-ba.com	(717) 852-1472	(717) 852-1615

Plan Summary



A. SERVICE AREA & MAJOR PROBLEMS

The service area of the existing Chambersburg Wastewater Treatment Plant (WWTP) includes the entire Borough of Chambersburg, along with portions of Greene, Hamilton, and Guilford Townships, in Franklin County, Pennsylvania (see Figure II-1). A small portion of Letterkenny Township is also serviced through Hamilton Township.

The Chambersburg WWTP is located in the Potomac River Basin within the Chesapeake Bay Watershed, and will therefore be subject to Total Phosphorous (TP) and Total Nitrogen (TN) limits of the Commonwealth's recently adopted Chesapeake Bay Tributary Strategy.

The Pennsylvania Department of Environmental Protection's (PADEP) regulations will require that WWTPs cap the discharge of TP and TN to 0.8 mg/L and 6.0 mg/L, respectively, at the current design flow of the plant. At the plant's current design flow of 6.8 MGD, the annual TP and TN loading caps for the plant will be 16,560 pounds and 124,199 pounds, respectively. This is equivalent to average daily TP and TN caps of approximately 45 pounds per day (lbs/d) and 340 lbs/d, respectively. Using those loading caps and the proposed design flow of 10.83 MGD, the actual TP and TN effluent concentrations will be 0.50 mg/L and 3.77 mg/L, respectively. This represents a 37% reduction in the effluent concentration for these nutrients.

The existing treatment facilities at the Chambersburg WWTP are not able to meet the newly adopted nutrient caps. Therefore, an upgrade of the WWTP will be required to meet the TN and TP caps. In addition to meeting the TN and TP caps, an expansion from 6.8 MGD to 10.83 MGD is needed to accommodate the anticipated growth within the service area. A peak design flow of 27.07 MGD has also been established for the plant design.

The proposed design flow of 10.83 MGD is a combination of the 20-year flow projections from Chambersburg Borough, Hamilton Township, Greene Township, and Guilford Township. The peak hourly design flow of 27.07 MGD was established by using a 2.50 peaking factor. Refer to Section IV for details on flow projections.

The Borough and Townships have initiated a substantial flow-metering program to better identify the location and quantity of flows influenced by peak storm events. The Borough has prepared a computer model of its conveyance system and is using actual flow data from the flow metering study to calibrate the computer model. The flow study and modeling effort will identify those portions of the conveyance system that might need improvements. Once identified, the Borough will take the appropriate action to repair, remediate or replace sewer sections as appropriate. Please see attached Consent Order and Agreement in Appendix 6.

B. SELECTED ALTERNATIVES

The Borough has determined that the WWTP will be expanded and upgraded to meet the new limits in a one-phase process as the preferred alternative. The upgrade will include the following:

- Construction of a second Vertical Loop Reactor (VLR) train identical to the existing VLR train.
- Construction of one (1) anaerobic selector tank to be located upstream of each VLR train, for a total of two (2) anaerobic selector tanks.
- Construction of one (1) secondary anoxic tank followed by one (1) re-aeration tank that will receive the effluent from each VLR, for a total of two (2) secondary anoxic tanks and two (2) re-aeration tanks.
- Construction of two (2) additional final clarifiers.
- Construction of a primary clarifier effluent splitter box to divide the flow to both VLRs.

- Construction of a Return Activated Sludge (RAS) splitter box to divide the RAS flow to both VLRs.
- Construction of a new RAS Pump Station/Blower Building for the proposed VLR.
- Retrofit of the final clarifier splitter box to accommodate two (2) new final clarifiers.
- Expand the UV Disinfection System
- Upgrade of the plant electrical service and SCADA system.

Implementation of the WWTP upgrade will allow the facility to meet the adopted TP and TN caps up to an influent flow rate of at least 10.83 MGD, which is the newly proposed capacity of the facility.

In addition to the upgrades mentioned above, the Borough will simultaneously expand and upgrade the existing solids handling system at the WWTP. Therefore, an analysis of a new solids handling facility was conducted. After significant analysis, the new aerobic digestion solids handling system (known as Alternative #1 in Section V) will include:

- Construction of three (3) new, second generation, Autothermal Thermophilic Aerobic Digesters (ATAD). This system will be the ThermAer Process as manufactured by Thermal Process Systems.
- Conversion of the dual WAS tanks to be the new Simultaneous Nitrification Denitrification Reactors (SNDR).
- Construction of a Biofilter for the ATAD system.
- Modifications to existing primary clarifier gravity thickener.
- Modifications to existing Primary and Secondary Anaerobic Digesters.
- Conversion of existing digested sludge holding tank to new Thickened Waste Activated Sludge (WAS) tank.
- Replacement of existing rotary drum thickeners with gravity belt thickeners.
- Replacement of existing belt filter presses with centrifuges
- Installation of ancillary components for complete installation.

As indicated in the PADEP-approved Task Activity Report (TAR), the Borough is conducting a separate interceptor study and will repair and replace specific portions of the collection and conveyance system at a later date.

C. COST ESTIMATES & PROJECT FUNDING

The total project cost to implement the WWTP biological treatment upgrade and expansion is estimated at $25,255,600. Project costs include construction, engineering, legal, administrative, and finance costs.

There is a possibility that Federal or State grant funding may be available for the construction projects required to upgrade WWTPs to meet the proposed nutrient limits imposed by the Chesapeake Bay Initiative. The size of grants through DCED's H2O PA grant program if any, are unknown. Although grants are being vigorously pursued, the financial analysis was done conservatively and did not include grant monies as a source of revenue. Therefore, it is presumed that the mandated plant upgrade will be financed through a 20-year bond issue unless the grant is awarded.

Since the Borough's estimated 2026 flow into the treatment plant is 3.51 MGD (out of the 10.83 total projected design flow), the Borough customers would be responsible for approximately 26% of the upgrade/expansion cost, based on an average between the costs to expand the plant to handle the increase in flow and the BNR upgrades required. Without substantial Federal or State funding assistance, the addition of the annual debt service required to finance the upgrade will require a 19% increase in the average Borough customer's user rate to $233 per year.

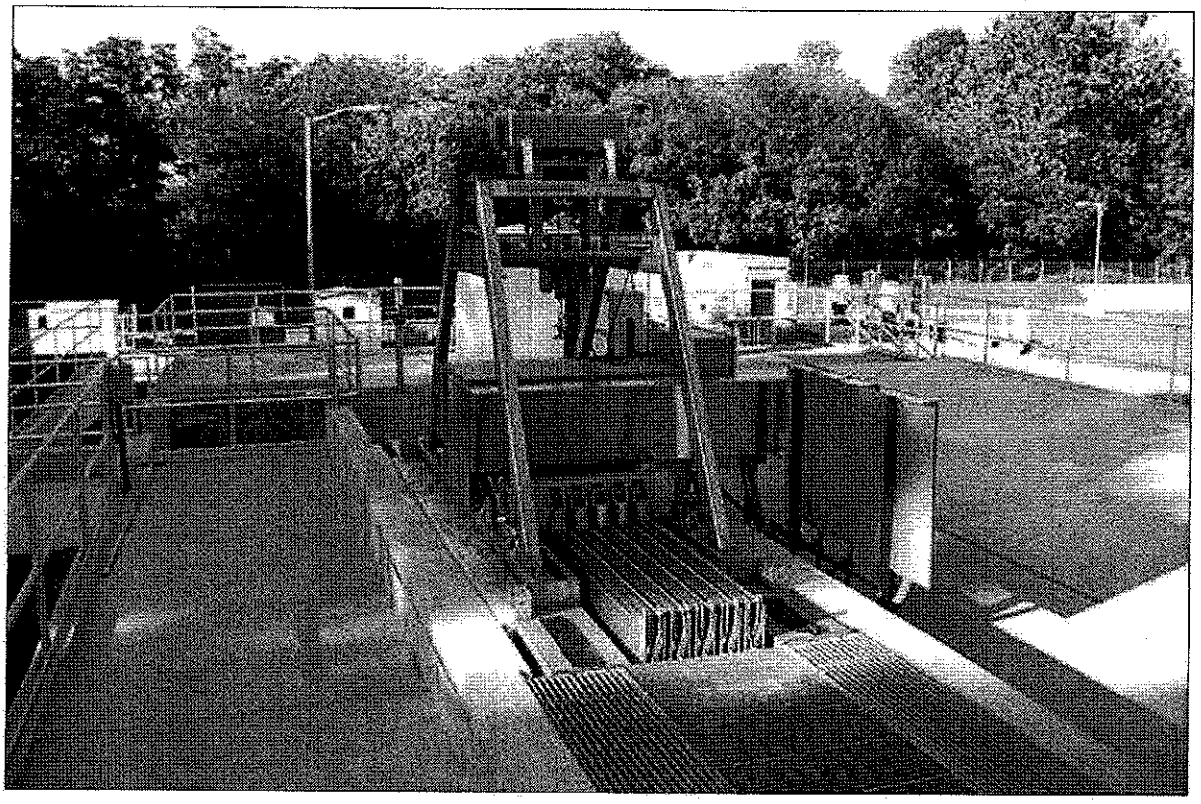
The total project cost for the upgrade to the solids handling facilities described in the previous section is estimated at $13,889,200. Implementing both the WWTP expansion and upgrade along with the upgrade to the solids handling facilities results in an estimated total project cost of $39,144,800. Since these facilities are going to be constructed in conjunction with the nutrient removal upgrade, the resultant debt service will require a 30% increase in Chambersburg user rates, to $254 per year.

D. MUNICIPAL COMMITMENTS

The Borough Council must enact a resolution to adopt this Act 537 Sewage Facilities Plan. Once that has been completed, and the Plan has been approved by the PADEP, the Borough will be responsible for implementing the activities described in the Plan.

The Borough is responsible for ownership, operation, and maintenance of all public wastewater facilities within the Borough. They also oversee the planning, design, permitting, and construction of renovations to the public sewer system within the Borough. The Borough is responsible for setting and collecting both the annual user rentals billed to customers and the tapping fees charged for new connections to the municipal wastewater system with the Borough of Chambersburg.

No new municipal departments or authorities will be required to implement the activities described in this Plan. The Borough and Townships are actively creating new inter-municipal agreements for the conveyance and treatment of wastewater generated in the Townships. The upgrade and expansion projects will move forward upon finalization of the new inter-municipal agreements.



E. IMPLEMENTATION SCHEDULE

The PADEP has indicated that all WWTPs within the Chesapeake Bay Watershed must begin meet the adopted TN and TP caps. To meet these caps, the following schedule is proposed for the WWTP upgrade and expansion:

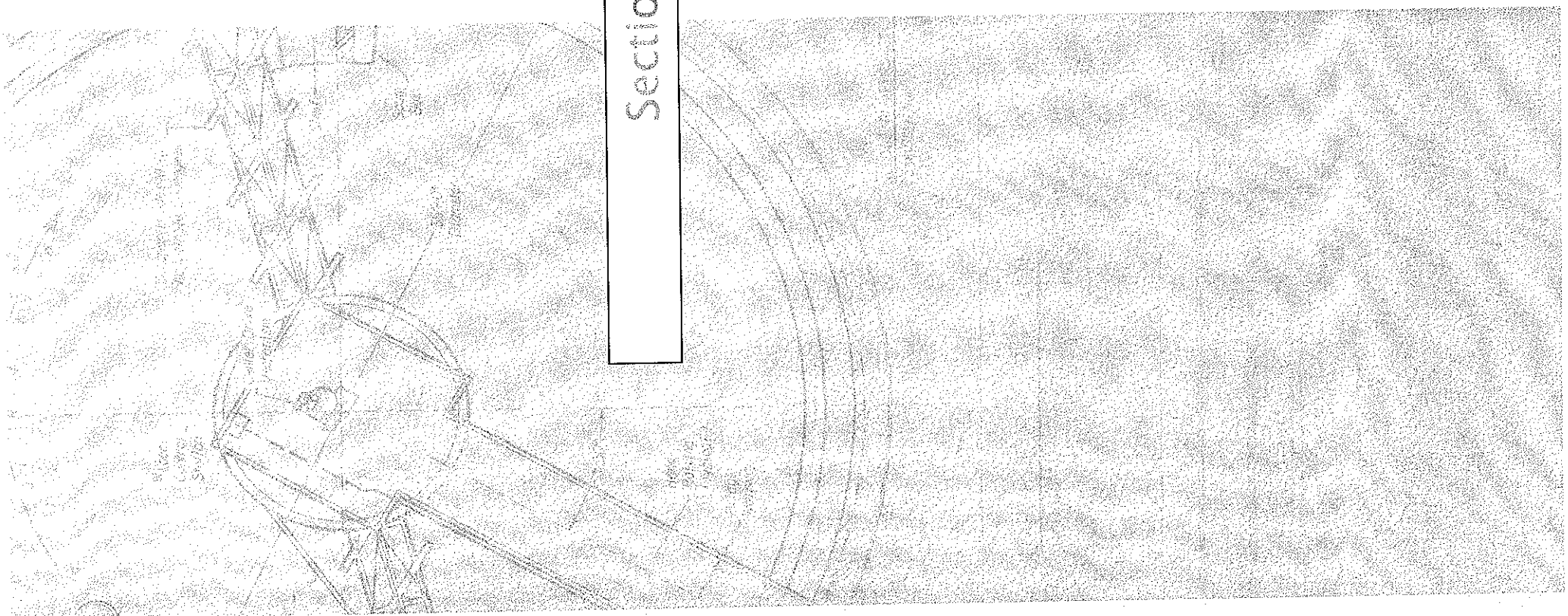
TABLE PS-1
IMPLEMENTATION SCHEDULE FOR THE
CHAMBERSBURG WWTP UPGRADE AND EXPANSION PROJECT

Activity	Date
Start Flow Metering Study	January 2008
Advertise for Public Comment	March 2009
Identify Conveyance Capacity Needs	June 2009
Execute Inter Municipal Agreements	September 13, 2010
Submit Act 537 Plan to PADEP	October 2010
PADEP Approval	January 2011
Begin WWTP Design	January 2011
Submit WQM Part II Permit Application to PADEP	April 2011
Part II Approval by PADEP	June 2011
Award Construction Contract	August 2011
Substantial Construction of WWTP Project	February 2013
Compliance With Effluent Limitations	March 2013
Complete Flow Metering Study	March 2013

F. ENVIRONMENTAL ISSUES

As described in Appendix 1, the Pennsylvania Natural Diversity Index (PNDI) search of the treatment plant and the resulting correspondence indicates there is one environmental issue associated with the proposed project. However, the response letter from the DCNR, dated April 15, 2010, indicates there will be no likely impact to the special concern species or resources.

Section 1



I.A. PAST WASTEWATER PLANNING

I.A.1. PLANNING PREVIOUSLY UNDERTAKEN UNDER THE SEWAGE FACILITIES ACT (ACT 537)

In 1994, the Borough of Chambersburg prepared an Official Act 537 Sewage Facilities Plan. This plan addressed the wastewater facility needs in the study area, which included the Borough of Chambersburg and the Townships of Greene, Guilford, and Hamilton. A portion of Letterkenny Township is also served through Hamilton Township. This Act 537 Plan Update does not evaluate these flow-contributing Townships, as each Township has prepared its own 20-year flow projections.

The plan recommended upgrading the Borough's Wastewater Treatment Plant (WWTP) from 5.2 million gallons per day (MGD) to 6.8 MGD. The facility upgrade involved the conversion of the existing trickling filter plant to a new activated sludge plant (vertical loop reactor process) with advanced treatment. The plan recommended an evaluation of ten (10) individual interceptor segments.

Both Hamilton and Greene Township updated their Act 537 Plan in early 2007. These updated plans include population and flow projections in each respective township. Guilford Township has not recently updated their Act 537 Plan, but has provided the Borough their 20-year flow projections.

I.A.2. PLANNING THAT HAS NOT BEEN CARRIED OUT ACCORDING TO AN APPROVED IMPLEMENTATION SCHEDULE CONTAINED IN THE PLANS

Since the Borough updated its sewage facilities plan in 1994, this paragraph is not applicable.

I.A.3. PLANNING THAT IS ANTICIPATED OR PLANNED BY APPLICABLE SEWER AUTHORITIES OR APPROVED UNDER A CHAPTER 94 CORRECTIVE ACTION PLAN

Chambersburg Borough is not conducting any sewage facilities planning separate from the preparation of this document.

The Borough is not subject to a Chapter 94 Corrective Action Plan.

I.A.4. PLANNING COMPLETED THROUGH PLANNING MODULES FOR NEW LAND DEVELOPMENT, PLANNING "EXEMPTIONS" AND ADDENDA

Although significant growth is expected and projected in the surrounding Townships of Greene, Hamilton, and Guilford, this plan solely focuses on the growth in the Borough of Chambersburg. As mentioned above, each township provided their separate 20-year flow projections for the Borough's Act 537 Plan Update.

As the Chambersburg Borough's Planning and Zoning Department suggests, there is substantial growth possible in the Borough. Table I-1 provides a list of all large residential developments that have been approved or proposed in the Borough. Note the number of residential housing units shown below is not equal to the 20 year projected increase of dwelling units, as shown in Table IV-2. Refer to Section IV for more details.

TABLE I-1
LARGE RESIDENTIAL DEVELOPMENTS (APPROVED OR PROPOSED)

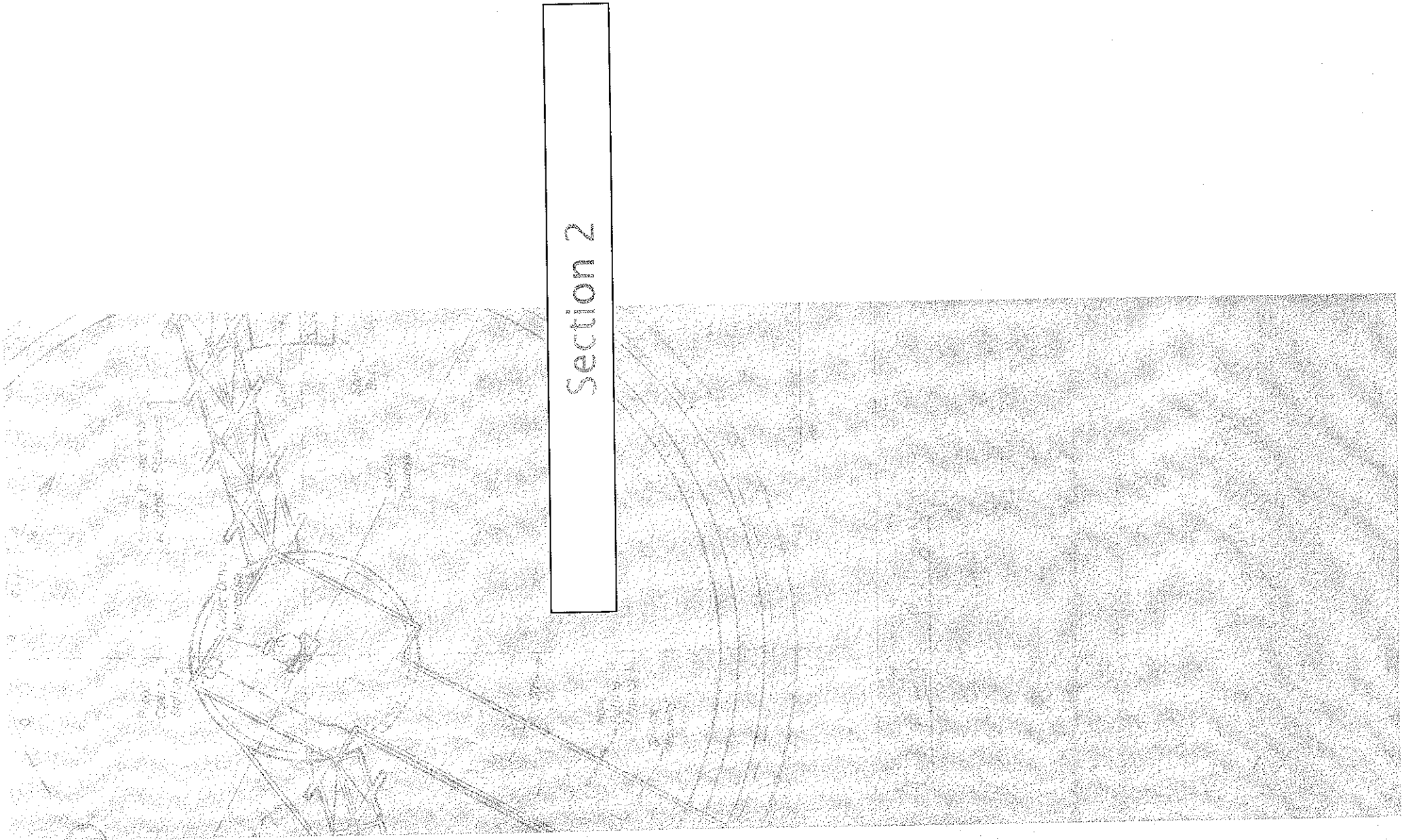
Name	Acres	Current DU	Proposed DU	Total DU
The Enclave	34	83	68	151
Grandview Crossing	5	2	18	20
Launch Meadows	94	203	28	231
Maple Run	108	238	74	312
Millcreek Acres West	23	50	150	200
Nicholson Square	74	330	148	478
Progress Square	2	0	30	30
Progress Village	28	0	467	467
Total	368	906	983	1889

Table I-2 provides a list of all undeveloped land that could be developed with residential dwelling units according to market demand. The data is intended for estimate purposes only.

TABLE I-2
POTENTIAL RESIDENTIAL DWELLING UNITS (DU) ON UNDEVELOPED LAND

Name	Acres	Single Family	Duplex	Town House	Apt.
Nitterhouse Family Holdings	6	39	54	82	109
Nelson Rotz Property	60	392	545	817	1089
Sunnyhill Development	15	98	136	204	272
Nitterhouse Property	93	608	844	1266	1688
Total	174	1137	1579	2369	3158

Section 2



II. Physical And Demographic Analysis

II.A. IDENTIFICATION OF PLANNING AREA, MUNICIPAL BOUNDARIES, AND SERVICE AREA BOUNDARIES

The sewage facilities planning area includes the entire Borough of Chambersburg, along with portions of Greene, Hamilton, and Guilford Townships. A portion of Letterkenny Township is also served by Hamilton Township, and wastewater from this portion flows into the Chambersburg WWTP. The Borough is bounded to the north and northeast by Greene Township, to the west and southwest by Hamilton Township, and to the east and southeast by Guilford Township. The planning area and municipal boundaries are shown on Figure II-1. The USGS Quad Map for Chambersburg, PA with the project area identified is shown on Figure II-2. An aerial photograph of the site has been included to further identify the project boundaries as shown in Figure II-3.

II.B-F. IDENTIFICATION OF PHYSICAL CHARACTERISTICS, SOILS, GEOLOGIC FEATURES, TOPOGRAPHY, AND POTABLE WATER SUPPLY

The primary purpose of this Act 537 Sewage Facilities Plan is to analyze alternatives for nutrient removal at the Chambersburg WWTP. Additionally, most of the Borough is already provided with public sewer and potable water service. Therefore, as indicated in the Task Activity Report (TAR) for this Act 537 Plan, no discussion of physical characteristics, soils, geologic features, topography or potable water supply within the study area is included.

The Comprehensive Plan for Chambersburg Borough is currently being revised and upon adoption will provide a detailed description of the physical characteristics, soils, geologic features, topography, and potable water supply within the Borough.

II.G. WETLANDS & FLOODPLAINS

Again, Chambersburg's revised Comprehensive Plan will provide a detailed description of the presence of wetlands and floodplains throughout the Borough. Since any proposed construction resulting from the conclusions of this Act 537 Plan will be confined to the existing WWTP site, the discussion of the presence and location of wetlands and floodplains is limited to the WWTP site. Current National Wetlands Inventory mapping supplied by the U.S. Fish and Wildlife Services website indicate the potential for wetlands to be adjacent to or present on the Borough of Chambersburg WWTP site. The construction activities anticipated for expansion and upgrade of this facility will be outside of the wetland areas and as such will not impact the wetland resources. In addition, these anticipated construction activities are expected to remain outside of the 100-year floodplain as delineated on the Flood Insurance Rating Map as provided by the Federal Emergency Management Agency.

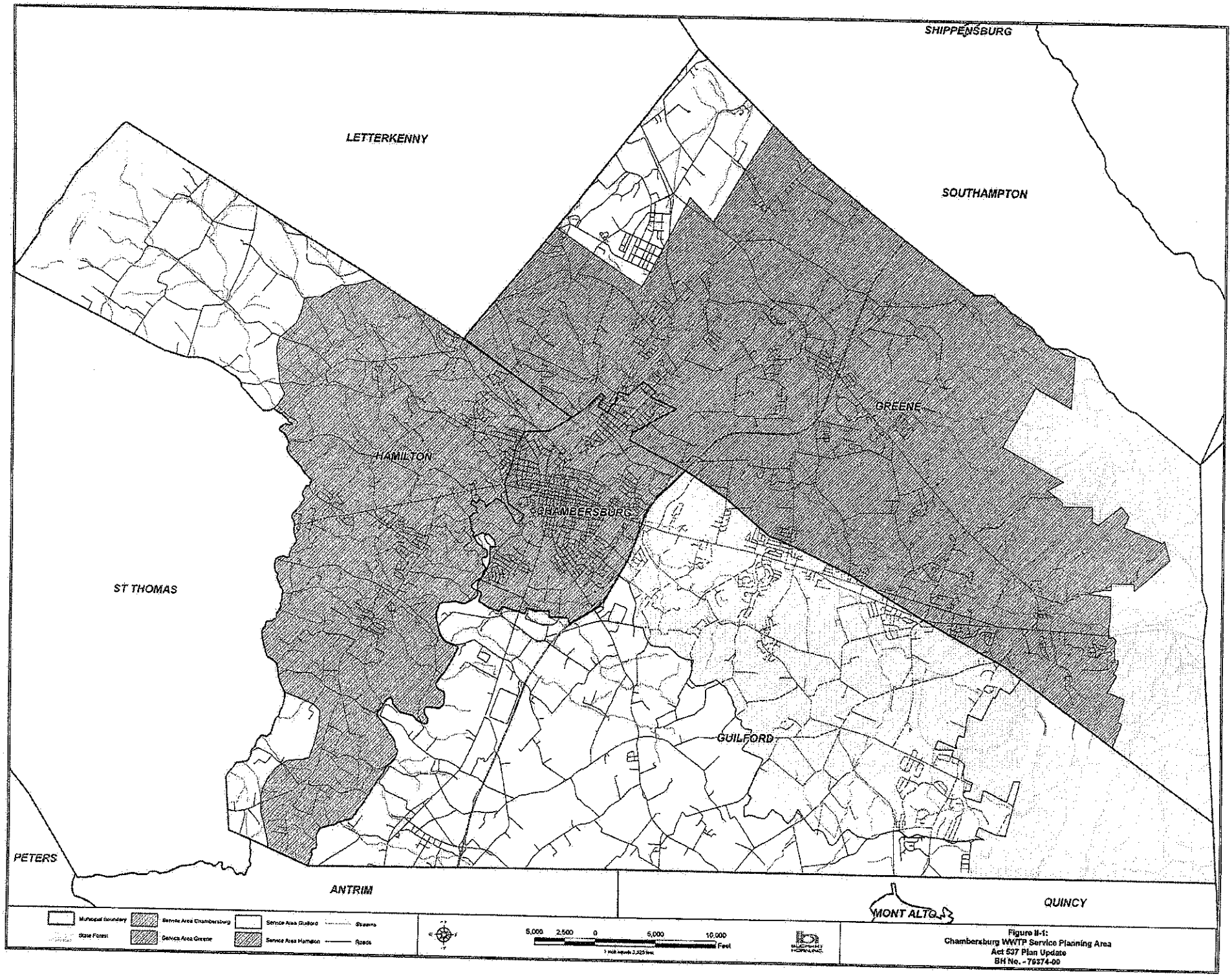
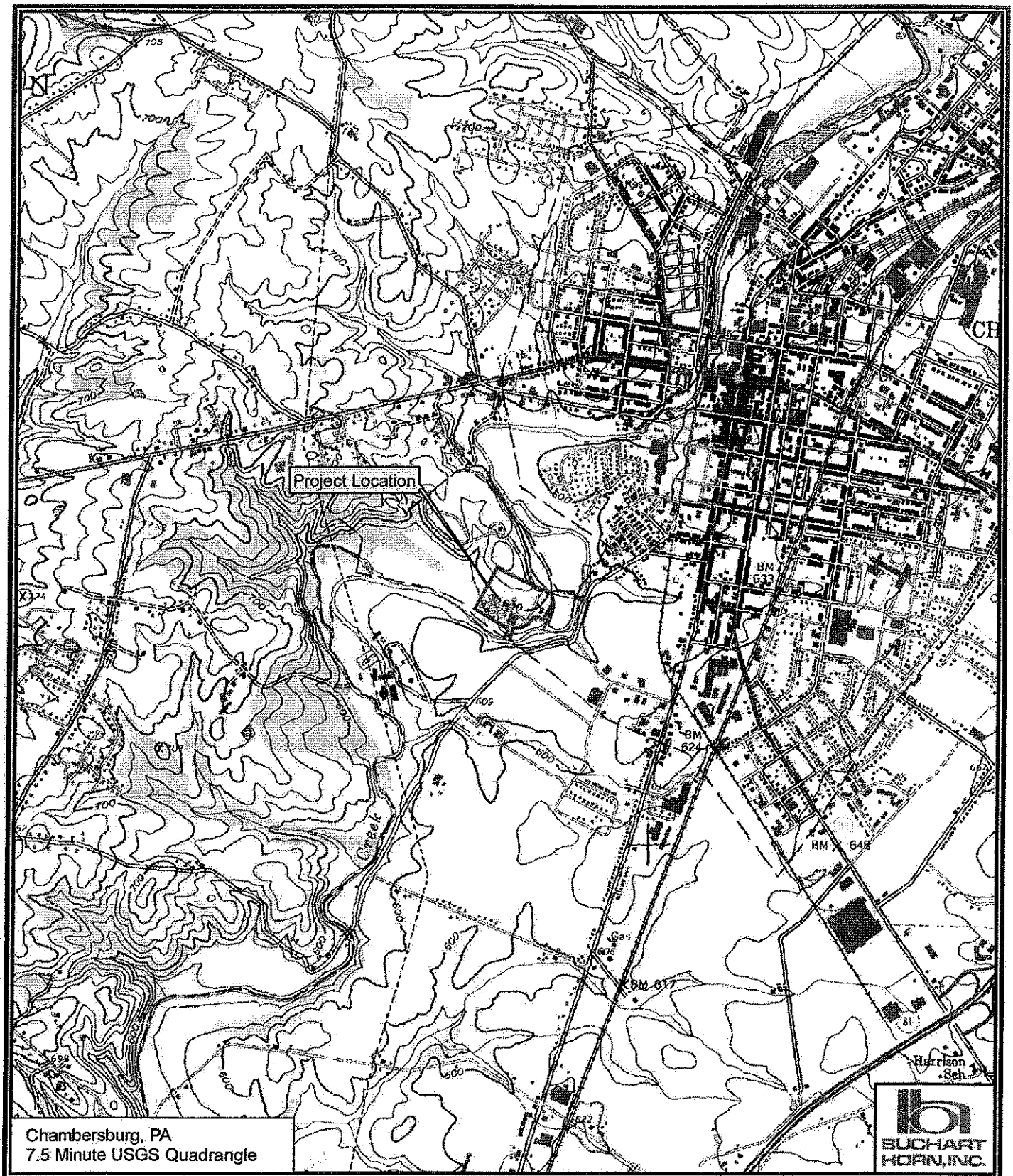


Figure II-1:
Chambersburg WWTP Service Planning Area
Act 537 Plan Update
BH No. - 70374-00



Legend

Project Location

1,000 500 0 1,000 2,000 Feet

1 inch equals 2,000 feet

Chambersburg WWTP
Act 537 Plan Update
Figure II-2: USGS Quad Map
Franklin County, Pennsylvania
BH No. 76374-00

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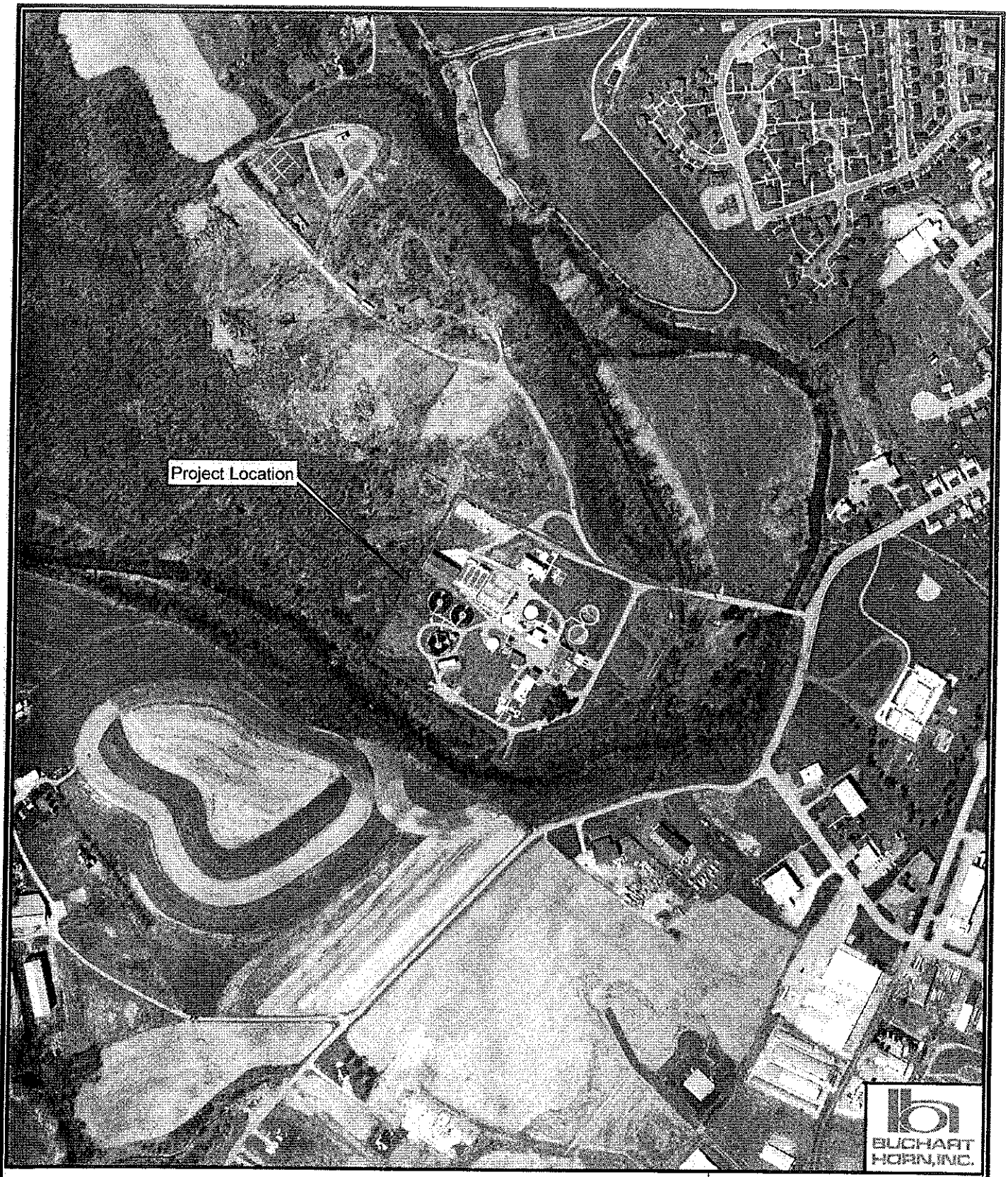

Legend

Project Location

500 250 0 500 Feet

1 inch equals 500 feet

BUCHART HORN, INC.

Chambersburg WWTP
Act 537 Plan Update
Figure II-3: Aerial View
Franklin County, Pennsylvania
BH No. 76374-00

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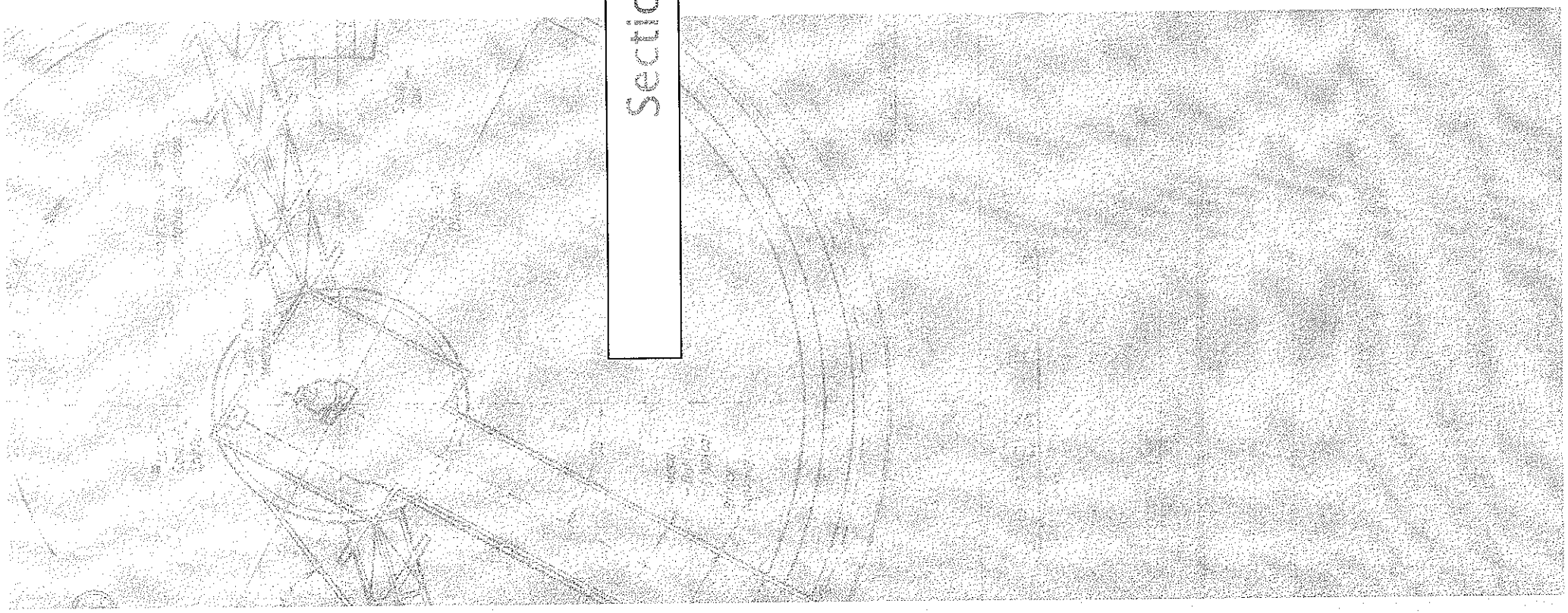
Section 3



III. Existing Sewage Facilities

III.A. EXISTING SEWERAGE SYSTEMS

III.A.1. EXISTING MUNICIPAL SEWERAGE SYSTEMS

III.A.1.a. EXISTING WASTEWATER TREATMENT PLANT

The existing Chambersburg Wastewater Treatment Plant (WWTP) is located off of Dump Road in the southwest portion of Chambersburg Borough (see Figure II-2). Treated effluent from the WWTP discharges into the Conococheague Creek, eventually entering the Potomac River and the Chesapeake Bay. The WWTP has the following effluent limits, regulated under NPDES Permit No. PA0026051:

TABLE III-1
CURRENT NPDES DISCHARGE LIMITS FOR THE CHAMBERSBURG WWTP

Parameter	Discharge Limit						
	Mass Limit (lbs/day)				Concentration Limit (mg/L)		
	Average Monthly (lbs/day)	Average Weekly (lbs/day)	Average Monthly (lbs/mo)	Total Annual (lbs/yr)	Average Monthly	Average Weekly	Instant. Maximum
Flow (MGD)	Monitor & Report	Monitor & Report	XXX	XXX	XXX	XXX	XXX
Influent BOD_5 & TSS	Monitor & Report	Monitor & Report	XXX	XXX	Monitor & Report	XXX	XXX
pH (S.U.)	XXX	XXX	XXX	XXX	6.0 to 9.0 inclusive at all times		
pH	XXX	XXX	XXX	XXX	Minimum of 5.0 mg/l at all times		
Total Suspended Solids	1,701	2,552	XXX	XXX	30	45	60
$CBOD_5$ (5/1 to 10/31)	851	1,248	XXX	XXX	15	22	30
$CBOD_5$ (11/1 to 4/30)	1,418	2,268	XXX	XXX	25	40	50
NH_3-N (5/1 to 10/31)	198	XXX	Monitor & Report	XXX	3.5	XXX	7
NH_3-N (11/1 to 4/30)	567	XXX	Monitor & Report	XXX	10	XXX	20
Total Phosphorous	XXX	XXX	Monitor & Report	Monitor & Report	XXX	XXX	XXX
TKN-N	XXX	XXX	Monitor & Report	XXX	Monitor & Report	XXX	XXX
NO_3-NO_2 as N	XXX	XXX	Monitor & Report	XXX	Monitor & Report	XXX	XXX
Total Nitrogen (TKN+NO_3+NO_2)	XXX	XXX	Monitor & Report	Monitor & Report	Monitor & Report	XXX	XXX
FC (#/100 mL) (5/1 to 9/30)	XXX	XXX	XXX	XXX	200	XXX	XXX

TABLE III-1 (CONTINUED)
CURRENT NPDES DISCHARGE LIMITS FOR THE CHAMBERSBURG WWTP

Parameter	Discharge Limit						
	Mass Limit (lbs/day)				Concentration Limit (mg/L)		
	Average Monthly (lbs/day)	Average Weekly (lbs/day)	Average Monthly (lbs/mo)	Total Annual (lbs/yr)	Average Monthly	Average Weekly	Instant. Maximum
FC (#/100 mL) (10/1 to 4/30)	XXX	XXX	XXX	XXX	2,000	XXX	XXX
Net Total Nitrogen	XXX	XXX	Monitor & Report	Monitor & Report	XXX	XXX	XXX
Net Total Phosphorous	XXX	XXX	Monitor & Report	Monitor & Report	XXX	XXX	XXX

MGD - million gallons per day
$CBOD_5$ - Carbonaceous Biochemical Oxygen Demand
TSS - Total Suspended Solids
NH_3-N - Ammonia Nitrogen
NO_2-N - Nitrite Nitrogen
NO_3-N - Nitrate Nitrogen
TKN - Total Kjeldahl Nitrogen
TN - Total Nitrogen
TP - Total Phosphorous
TRC - Total Residual Chlorine
DO - Dissolved Oxygen
FC - Fecal Coliform

TABLE III-1A
CURRENT NPDES DISCHARGE LIMITS FOR THE CHAMBERSBURG WWTP
EFFECTIVE FROM MARCH 1, 2008 THROUGH JULY 31, 2011

Parameter	Effluent Limitations				
	Mass Load (lbs)		Concentrations (mg/L)		
	Monthly	Annual	Minimum	Monthly Average	Maximum
Ammonia -- N	Report	Report	XXX	Report	XXX
Kjeldahl -- N	Report	XXX	XXX	Report	XXX
Nitrate -- Nitrite as N	Report	XXX	XXX	Report	XXX
Total Nitrogen	Report	Report	XXX	Report	XXX
Total Phosphorous	Report	Report	XXX	Report	XXX
Net Total Nitrogen	Report	Report	XXX	XXX	XXX
Net Total Phosphorous	Report	Report	XXX	XXX	XXX

TABLE III-1B
CURRENT NPDES DISCHARGE LIMITS FOR THE CHAMBERSBURG WWTP
EFFECTIVE FROM AUGUST 1, 2011 THROUGH FEBRUARY 28, 2013

Parameter	Effluent Limitations				
	Mass Load (lbs)		Concentrations (mg/L)		
	Monthly	Annual	Minimum	Monthly Average	Maximum
Ammonia -- N	Report	Report	XXX	Report	XXX
Kjeldahl -- N	Report	XXX	XXX	Report	XXX

TABLE III-1B (CONTINUED)
CURRENT NPDES DISCHARGE LIMITS FOR THE CHAMBERSBURG WWTP
EFFECTIVE FROM AUGUST 1, 2011 THROUGH FEBRUARY 28, 2013

Parameter	Effluent Limitations				
	Mass Load (lbs)		Concentrations (mg/L)		
	Monthly	Annual	Minimum	Monthly Average	Maximum
Nitrate – Nitrite as N	Report	XXX	XXX	Report	XXX
Total Nitrogen	Report	Report	XXX	Report	XXX
Total Phosphorous	Report	Report	XXX	Report	XXX
Net Total Nitrogen	Report	124,199	XXX	XXX	XXX
Net Total Phosphorous	Report	16,560	XXX	XXX	XXX

The current NPDES Permit is scheduled to expire on February 28, 2013.

Based upon sampling data collected by Borough staff, the influent wastewater to the Chambersburg WWTP had the following characteristics during the period of January 2008 through December 2009:

TABLE III-2
CHARACTERISTICS OF THE INFLUENT WASTEWATER INTO THE CHAMBERSBURG WWTP
JANUARY 2008 TO DECEMBER 2009

Parameter	Influent Values					
	Mass Loading (lbs/day)			Concentration (mg/L)		
	Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Instant. Maximum
Flow (MGD)	5.94	XXX	9.98	XXX	XXX	XXX
$CBOD_5$	12,289	XXX	19,649	254.6	XXX	475
TSS	8,630	XXX	18,318	181	XXX	416
NH_3-N	XXX	XXX	XXX	XXX	XXX	XXX
NO_2-N / NO_3-N	XXX	XXX	XXX	XXX	XXX	XXX
TKN	XXX	XXX	XXX	XXX	XXX	XXX
TN	XXX	XXX	XXX	9.26	XXX	XXX
TP	XXX	XXX	XXX	2.43	XXX	XXX
pH	XXX	XXX	XXX	XXX	XXX	XXX

The NPDES Permit indicates that the hydraulic design capacity of the WWTP is 6.8 million gallons per day (MGD), and that the effluent limits were determined based on this value. The permit states that this capacity is to be utilized in the preparation of the annual Municipal Wasteload Management (Chapter 94) Report to determine whether the WWTP is hydraulically overloaded. Title 25, Chapter 94 of the *Pennsylvania Code* defines a hydraulic overload as, "The condition that occurs when the monthly average flow entering a plant exceeds the hydraulic design capacity for 3-consecutive months out of the preceding 12 months...". According to Chambersburg Borough's 2009 Chapter 94 Report, the 2009 maximum three-month average flow (3MMF) was 6.40 MGD. The 3MMF

occurred during April through June. The 5-year average 3MMF for the years 2005 through 2009 was 6.403 MGD.

The Chambersburg Borough WWTP measures influent flow as wastewater exits the Headworks and again as wastewater exits the grit removal system. The average daily flow rate measured during 2009 was 5.78 MGD.

Title 25, Chapter 94 defines an organic overload as, "The condition that occurs when the average daily organic load exceeds the organic design capacity upon which the permit and the plant design are based." Chambersburg's 2009 Chapter 94 Report indicates that the maximum allowable influent organic loading for the WWTP, in terms of BOD_5, is 20,760 pounds per day (lb/d). The Chapter 94 Report states that the average daily organic loading at the WWTP in 2009 was 12,289 lb/d. The 5-year average daily organic loading for 2005 through 2009 was reported as 12,169 lb/d. The maximum monthly average organic load experienced for 2009 was 14,160 lb/d, which occurred in June.

Based on Chambersburg's monthly Discharge Monitoring Reports (DMR) for the period of January 2009 through December 2009, the WWTP effluent parameters were as shown in Table III-3.

TABLE III-3
CHARACTERISTICS OF THE CHAMBERSBURG WWTP EFFLUENT
JANUARY 2009 TO DECEMBER 2009

Parameter	Effluent Values					
	Mass Limit (lbs/day)			Concentration Limit (mg/L)		
	Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Instant. Maximum
Flow (MGD)	5.78	XXX	9.98	XXX	XXX	XXX
$CBOD_5$	92.5	XXX	303	2.40	XXX	6.9
TSS	149.7	XXX	440	4.02	XXX	10.0
NH_3-N	XXX	XXX	XXX	0.25	XXX	4.12
NO_2-N / NO_3-N	XXX	XXX	XXX	XXX	XXX	XXX
TKN	XXX	XXX	XXX	XXX	XXX	XXX
TN	XXX	XXX	XXX	8.72	XXX	15.71
TP	77.5	XXX	273	2.18	XXX	6.2
TRC	XXX	XXX	XXX	XXX	XXX	XXX
DO	XXX	XXX	XXX	8.71	XXX	13.95
pH	XXX	XXX	XXX	7.02	XXX	7.6
FC (#/100 mL) (5/1 to 9/30)	XXX	XXX	XXX	6.4	XXX	2410
FC (#/100 mL) (10/1 to 4/30)	XXX	XXX	XXX	3.29	XXX	228

III.A.1.b. EXISTING WASTEWATER COLLECTION AND CONVEYANCE SYSTEM

The purpose of this Act 537 Plan is to analyze alternatives for nutrient removal at the Chambersburg WWTP. As indicated in the PADEP-approved Task Activity Report (TAR), the Borough is conducting a separate interceptor study and may repair and replace specific portions of the collection and conveyance system at a later date.

For this study, a SewerCAD model was developed from the available GIS information for the Borough's collection system. Missing invert elevations and pipe sizes were supplied from Borough personnel and onsite investigations. This study reviewed the capacity of the interceptors to handle flow from the contributing Townships and from within the Borough, based on current and five-year project flows. The contributing Township current flows are based upon flow metering data supplied to the Borough on a monthly basis. Flows within the Borough, have been spread throughout the interceptor sub basins based upon estimated EDUs for each subbasin.

TABLE III-4
PROJECTED FLOWS BY METERED CONNECTION

Point Of Connection	Actual 2006 Flow (MGD)	Project 2011 Flow (MGD)
Guilford Township		
- Wayne Avenue	0.076	0.087
- Walker Road	0.417	0.476
- Route 11 South	0.06	0.210
- Loop Road Pump Station	0.008	0.008
Greene Township		
- Penn Hall	1.658	1.894
- Includes Philadelphia Ave - Greene		
- Includes Woodstock – Guilford		
- Includes North Guilford – Guilford		
Hamilton Township		
- Commerce Street	0.262	0.299
- W. Washington	0.588	0.672

TABLE III-5
CHAMBERSBURG BOROUGH PROJECTED FLOWS
ESTIMATED BY SUB BASIN

Sub Basin	Actual 2006 Flow (MGD)	Project 2011 Flow (MGD)
West Conococheague Interceptor	0.296	0.339
Falling Springs / East Conococheague Interceptor	1.285	1.354
South Interceptor	0.395	0.565
TOTAL:	1.976	2.258

As part of the PADEP Consent Order and Agreement, flow metering is currently being performed within the Borough's collection system. This flow metering information will be entered into the SewerCAD model to calibrate the Borough's flow within the sub basins to accurately predict possible future capacity concerns within the collection system. Figure III-1 is the current collection system within the Borough. This figure also details the flow metering stations located on the interceptors at the Township connection points.

The following tables provide capacity of the interceptors located within the Borough. For this study, the interceptors were divided into segments based upon pipe size. Capacity for the segments was based on the pipe size, actual slope as provided within the GIS information, and an "n" factor representative of the pipe material. For purposes of this study, the most restrictive capacity from each segment is listed within the table

Falling Spring Interceptor

The Falling Spring Interceptor starts in and receives flow from Guilford Township. The interceptor runs along Falling Spring Creek until in joins with the East Conococheague Interceptor. A portion of this interceptor was replaced in 2005 through a joint effort between the Borough of Chambersburg and Guilford Township. The interceptor has been divided into two segments for this evaluation. The segments are identified in Table III-6.

TABLE III-6
FALLING SPRING INTERCEPTOR CAPACITIES

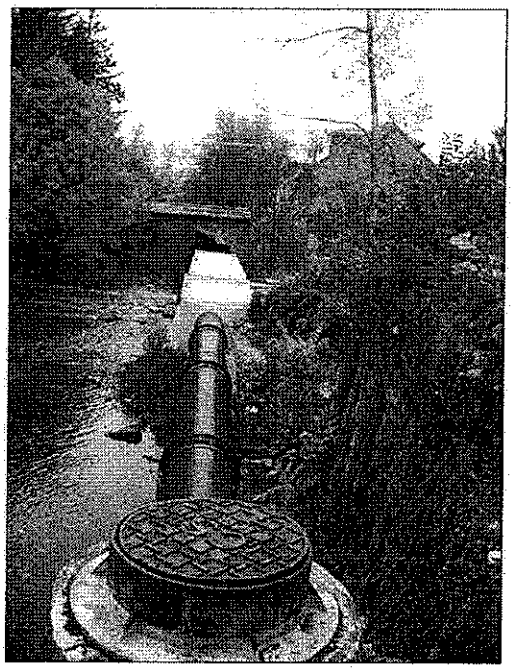
Line Segment	Pipe Diameter (inches)	Roughness Coefficient "n"	ADF Capacity (MGD)	Approximate 2006 Flow (MGD)	Projected 2011 Flow (MGD)
F-00-1647 to F-001621	24	0.013	12.59	0.69	0.79
F-00-1621 to M-00-1348	27	0.013	30.37	1.00	1.10

East Conococheague Interceptor

The East Conococheague Interceptor runs along the east bank of the Conococheague Creek. This interceptor receives flow from the Falling Spring Interceptor at manhole M-00-1348. This interceptor travels south along the Conococheague Creek until the West Conococheague Interceptor joins at manhole M-00-1309. The Hamilton Township Washington Street Interceptor joins the East Conococheague Interceptor at manhole M-00-1325. This interceptor then continues on to the WWTP. The interceptor has been divided into five segments for this evaluation. The segments are identified in Table III-7.

TABLE III-7
EAST CONOCOCHEAGUE INTERCEPTOR CAPACITIES

Line Segment	Pipe Diameter (inches)	Roughness Coefficient "n"	ADF Capacity (MGD)	Approximate 2006 Flow (MGD)	Projected 2011 Flow (MGD)
M-00-1363 to M-00-1354	18	0.013	1.81	0.09	0.90
M-00-1354 to M-00-1366	20"x 30" oval	0.013	5.47	1.19	1.28
M-00-1366 to M-00-1436	24	0.013	9.38	1.73	2.11
M-00-1436 to M-00-1307	36	0.013	25.36	5.14	6.09
M-00-1307 to M-00-1305	48	0.013	70.57	5.14	6.09



Penn Hall Interceptor

The Penn Hall Interceptor receives flow from the Greene Township Interceptor. This flow from Greene also contains flow from the Guilford Woodstock and North Guilford sub basins. This interceptor runs along the east bank of the Conococheague Creek until the area of Commerce Street where it crosses over to the west bank via three siphons. This interceptor flows into the West Conococheague Interceptor at manhole C-05-1244. The interceptor has been divided into four segments for this evaluation. The segments are identified in Table III-8.

TABLE III-8
PENN HALL INTERCEPTOR CAPACITIES

Line Segment	Pipe Diameter (inches)	Roughness Coefficient "n"	ADF Capacity (MGD)	Approximate 2006 Flow (MGD)	Projected 2011 Flow (MGD)
C-00-0721 to C-00-0718	30	0.013	13.12	2.44	2.83
C-00-0718 to C-00-0707	36	0.013	20.5	2.65	3.04
C-00-0707 to C-00-0706	12", 16" & 20" siphons	0.013	4.27 @ ADF	2.65	3.04
C-00-0706 to C-00-0704	36	0.013	41.50	2.65	3.04

West Conococheague Interceptor

The West Conococheague Interceptor starts at manhole C-05-1244 which receives flow from the Penn Hall Interceptor and the Hamilton Township Commerce Street Interceptor. This interceptor then travels along the west bank of the Conococheague Creek until it joins the East Conococheague interceptor at MH-00-1309. The interceptor has been divided into two segments for this evaluation. The segments are identified in Table III-9.

TABLE III-9
WEST CONOCOCHEAGUE INTERCEPTOR CAPACITIES

Line Segment	Pipe Diameter (inches)	Roughness Coefficient "n"	ADF Capacity (MGD)	Approximate 2006 Flow (MGD)	Projected 2011 Flow (MGD)
C-05-1244 to C-00-0686	36	0.013	21.76	2.99	3.53
C-00-0686 to M-00-1309	42	0.013	21.21	3.07	3.61

Wayne Avenue Interceptor

The Wayne Avenue Interceptor receives flow from Guilford Township. This interceptor joins the South Interceptor in South Main Street north of Eisenhower Drive. The interceptor has been divided into three segments for this evaluation. The segments are identified in Table III-10.

TABLE III-10
WAYNE AVENUE INTERCEPTOR CAPACITIES

Line Segment	Pipe Diameter (inches)	Roughness Coefficient "n"	ADF Capacity (MGD)	Approximate 2006 Flow (MGD)	Projected 2011 Flow (MGD)
S-00-0050 to S-00-0048	10	0.013	2.38	0.07	0.09
S-00-0048 to S-00-0036	14	0.013	3.29	0.21	0.23
S-00-0036 to S-00-0024	15	0.013	5.92	0.43	0.46

South Interceptor

The South Interceptor receives flow from the Wayne Avenue Interceptor. This interceptor collects the rest of the flow from the south west area of the Borough and then runs underneath the Conococheague Creek via two siphons to the WWTP. The interceptor has been divided into four segments for this evaluation. The segments are identified in Table III-11.

TABLE III-11
SOUTH INTERCEPTOR CAPACITIES

Line Segment	Pipe Diameter (inches)	Roughness Coefficient "n"	ADF Capacity (MGD)	Approximate 2006 Flow (MGD)	Projected 2011 Flow (MGD)
S-00-0024 to S-00-0008	18	0.013	5.14	0.55	0.58
S-00-0008 to S-00-0003	21	0.013	5.41	0.65	0.68
S-00-0003 to S-00-0002	6" & 10" siphons	0.013	2.13 @ ADF	0.65	0.68
S-00-0002 to S-00-0001	21	0.013	14.72	0.68	0.68

Potential Surcharge Segments

The flow model is based on reported flow entering the Borough from the contributing Townships and assumed flow within the Borough. Based on these assumptions, the flow model has predicted that the following areas merit further study due to the potential to surcharge during peak flow events. The Borough is currently performing a flow metering study within the Borough's collection system. This flow data will be entered into the flow model to validate or eliminate these identified potential surcharge segments. The areas identified for further study are listed in Table III-12.

TABLE III-12
AREAS REQUIRING FURTHER INVESTIGATION

Interceptor	Line Segment	Pipe Capacity Range (MGD)	Peak Flow - ADF x 2.5 Peak (MGD)
East Conococheague	M-00-1332 to M-00-1327	1.09 – 1.21	3.57
East Conococheague	M-00-1327 to M-00-1320	1.03 – 3.48	4.77
Penn Hall	Borough entry to C-00-0720	5.59 – 7.65	7.53
Penn Hall	C-0-0714 to C-00-0973	6.19	8.06
Wayne Avenue	S-00-0043 to S-00-0042	0.35	0.45

III.A.2. EXISTING TREATMENT PROCESSES

III.A.2.a. GENERAL

The original Chambersburg WWTP was constructed in the early 1910's. Major renovations of the WWTP occurred during the periods of 1938-1939, 1957-1959, 1980-1982, and 1995-1997. The most recent plant expansion and upgrade in 1997-1999 increased the permitted flow from 5.2 MGD to 6.8 MGD. During that expansion, the plant was converted from a trickling filter plant to a new activated sludge plant with advanced secondary treatment. The activated sludge plant utilizes a vertical loop reactor to biologically treat the wastewater.

Figure III-2 provides a schematic process flow diagram of the existing WWTP, while Figure III-3 shows the hydraulic profile of the plant. Figure III-4 is a site plan of the existing facility. The various unit processes within the WWTP are described in the following sections.

III.A.2.b. HEADWORKS AND PUMP STATION

Influent flow enters the WWTP through a 48-inch diameter gravity interceptor. After large solids are reduced in size by a channel macerator, the wastewater flows through the influent parshall flume to determine the influent flow rate and discharges into an influent pump station. The wastewater is then pumped to the grit removal system through two variable speed vertical turbine pumps and five centrifugal pumps, which are used during high flow conditions.

The wastewater then flows through two 16-inch diameter pipes to a vortex-type grit chamber. The grit chamber functions as a grit removal device by maintaining light organic particles in suspension while heavier grit and sand settles out. Settled grit and sand is collected and removed from the chamber and discharged to a container which can be transported by truck to a sanitary landfill for disposal.

De-gritted wastewater then flows through the grit chamber parshall flume used to measure the flow rate through the plant. The flow enters a 42-inch pipe that conveys the de-gritted wastewater to the influent splitter box for the primary clarifiers.

III.A.2.c. PRIMARY CLARIFIERS

Wastewater from the grit chamber flows through one 42-inch pipe to the influent splitter box for the plug-flow primary clarifiers. The splitter box contains four weirs followed by slide gates to evenly distribute the flow to the existing four primary clarifiers. The slide gates allow for the isolation of one or more primary clarifiers for maintenance or other needs. Each primary clarifier has an average liquid volume of approximately 226,000 gallons, with a side water depth of 11.5 feet. Clarified wastewater overflows the primary clarifier weirs and flows by gravity to the vertical loop reactor influent channel.

The settled solids in the primary clarifiers are pumped to the gravity thickener for thickening prior to being fed into the primary anaerobic digester.

III.A.2.d. VERTICAL LOOP REACTOR AERATION TANKS

The VLR is a complete mix tank in which the influent wastewater is quickly dispersed across the full width of the first aeration tank. The aeration tanks operate in the A/O (anoxic-oxic) mode. With this scheme, return activated solids (RAS) are discharged at the head of the aeration tanks, and are stabilized in this first half of the tanks. Raw wastewater is then introduced at one of three potential points: the influent channel, the first aeration tank, or the second aeration tank.

Raw wastewater, after entering the influent channel, flows into the first aeration tank. The raw wastewater and return activated sludge is completely mixed in an anoxic environment. This wastewater and MLSS mixture then flows through aeration tank #2 to aeration tank #4. In the subsequent aeration tanks, the dissolved oxygen levels are increased to meet the treatment objectives.

The treated wastewater and MLSS flows over the effluent weir located in aeration tank #4. This overflow travels to the final clarifier influent splitter box.

III.A.2.e. FINAL CLARIFIERS

Biologically treated effluent from the vertical loop reactor aeration tanks then encounter a Final Clarifier flow splitter. The flow splitter distributes the water to three separate final clarifiers for further solids separation. Overflow from the three clarifiers progress onto UV disinfection, while the sludge underflow flows by gravity to the RAS sludge pump station.

Settled RAS is drawn off the bottom of each clarifier through a series of suction pipes that discharge into a return solids well located in the center of the clarifier.

Waste activated solids (WAS) are drawn off the bottom of the clarifiers, and flow through 6-inch pipes to two WAS holding tanks. WAS is then transferred to the belt filter press for dewatering.

Scum on the surface of each clarifier is collected into a scum trough by a rotating skimmer mechanism. Scum is then discharged into a scum pit. From there, scum is pumped by two solids transfer / scum pumps into the digesters.

III.A.2.f. UV DISINFECTION

Overflow from the three final clarifiers flow by gravity to the UV disinfection tank. The treated water is then metered after exiting the tank.

III.A.2.g. POST AERATION CASCADE

Post aeration steps are utilized following the UV disinfection tanks. A series of steps aerates the disinfected wastewater to increase the dissolved oxygen content before discharging into the Conococheague Creek.

A composite effluent sampler draws samples of treated effluent from the pos-aeration tank.

III.A.2.h. SOLIDS DEWATERING AND HANDLING

The treatment plant's existing solids dewatering process consists of two separate processes. The first is anaerobic digestion of the primary clarifier sludge that utilizes a gravity thickener tank, two digester tanks and one digested sludge holding tank. The second process involves aeration of the waste activated sludge (WAS) removed from the secondary clarifiers. The equipment used for this process consists of two WAS holding tanks. In addition two belt filter presses, lime silo and conveyor and various pumps complete the dewatering system.

Two primary sludge pumps transfer sludge from the primary clarifiers to the gravity thickener tank. Sludge is then drawn into the digester tanks through the use of three digester feed and transfer pumps. Two separate belt filter press pumps then transfer digested sludge to the two belt filter presses for dewatering.

Four RAS sludge pumps transport RAS sludge from the final clarifiers to the vertical loop reactors. Pumps also divert WAS to two WAS holding tanks. Two WAS sludge pumps then transport sludge from the WAS holding tanks to the two belt filter presses for dewatering.

Dependant upon disposal method, dewatered biosolids can be mixed with lime drawn from a silo, and are then conveyed to a dump truck. The dump truck periodically hauls dewatered solids to the covered Biosolids Storage Pad.

By closely controlling the lime feed rate and segregating dried solids into batches on the storage pad, the WWTP is able to generate Class A Biosolids.

When lime addition is not selected the facility generates Class B Biosolids that are disposed of in the Blue Ridge Landfill located in Franklin County.

Filtrate from the belt press is returned to the WWTP influent flow stream.

Screenings and grit removed from the influent wastewater flow are disposed at a permitted landfill.

III.A.2.I. MISCELLANEOUS

An engine-driven generator, located next to the Administration Building, and automatic transfer switch allow plant operations to continue during power outages.

The Administration Building also houses a laboratory, offices, locker rooms, and a conference room. The Maintenance Building also houses garage bays and a maintenance shop. There is also a multi-bay garage on the WWTP site.

III.A.3. PROBLEMS WITH EXISTING WASTEWATER FACILITIES

III.A.3.a. WASTEWATER TREATMENT PLANT

The Chambersburg WWTP routinely meets NPDES Permit limits and is well maintained by the Borough wastewater staff. The 2009 average flow to the WWTP was roughly 5.78 million gallons-per-day (MGD), while the facility is rated for 6.8 MGD.

III.A.3.b. COLLECTION AND CONVEYANCE SYSTEM

The Chambersburg wastewater collection and conveyance system is well maintained by the Borough wastewater staff. However, as indicated in the PADEP-approved Task Activity Report (TAR) for this Act 537 Plan, the Borough is conducting a study to repair and replace specific portions of the collection and conveyance system.

The Borough and Townships have initiated a substantial flow-metering program to better identify the location and quantity of flows influenced by peak storm events. The Borough has prepared a computer model of its conveyance system and is using actual flow data from the flow metering study to calibrate the computer model. The flow study and modeling effort will identify those portions of the conveyance system that might need improvements. Once identified, the Borough will take the appropriate action to repair, remediate or replace sewer sections as appropriate. See attached Consent Order and Agreement in Appendix 6.

As indicated in the Borough's Chapter 94 Report, the Borough is responsible for the care and maintenance of the sewer system within Chambersburg Borough. The system is inspected and maintained on a regular basis by six Borough sewer maintenance employees. There are ongoing infiltration and inflow problems primarily because of the age of the terra cotta pipelines. Some of this pipe dates back to the early 1900's. Joint failure on this old pipe is common. The Borough is also performing wet weather visual monitoring as opportunity presents itself. The Borough realizes the inflow and infiltration reduction program will be a continual effort that will require significant funding and time. The Borough is working with the tributary municipalities so that a flow metering studies will be conducted and I&I reduction are undertaken.

III.A.4. PLANNED UPGRADES AND EXPANSIONS

Chambersburg plans to upgrade and expand the wastewater treatment from 6.8 MGD to 10.83 MGD.

III.A.5. EXISTING SMALL FLOW TREATMENT FACILITIES

As indicated in the approved TAR, no discussion of existing small flow treatment facilities (SFTF) is included in this 537 Plan.

III.A.6. EXISTING WASTEWATER DISPOSAL AREAS

As described above, the Chambersburg WWTP discharges effluent to the Conococheague Creek. Therefore, this section is not applicable.

III.B. EXISTING INDIVIDUAL AND COMMUNITY ON-LOT SEWAGE DISPOSAL SYSTEMS

The overwhelming majority of developed properties currently existing in Chambersburg Borough are served by public sewers and are provided with public water. Additionally, as indicated previously, the focus of this Act 537 Plan is to analyze alternatives for implementing nutrient removal at the WWTP. For these reasons, no discussion of on-lot sewage disposal systems (OLDS) is included, as stated in the approved TAR.

III.C. WASTEWATER BIOSOLIDS

III.C.1. SOURCES OF WASTEWATER BIOSOLIDS

As indicated in Sections III.A.2.h., biosolids generated at the facility are treated by either anaerobic or aerobic digestion and dewatered in a belt filter press.

III.C.2. QUANTITIES OF WASTEWATER BIOSOLIDS

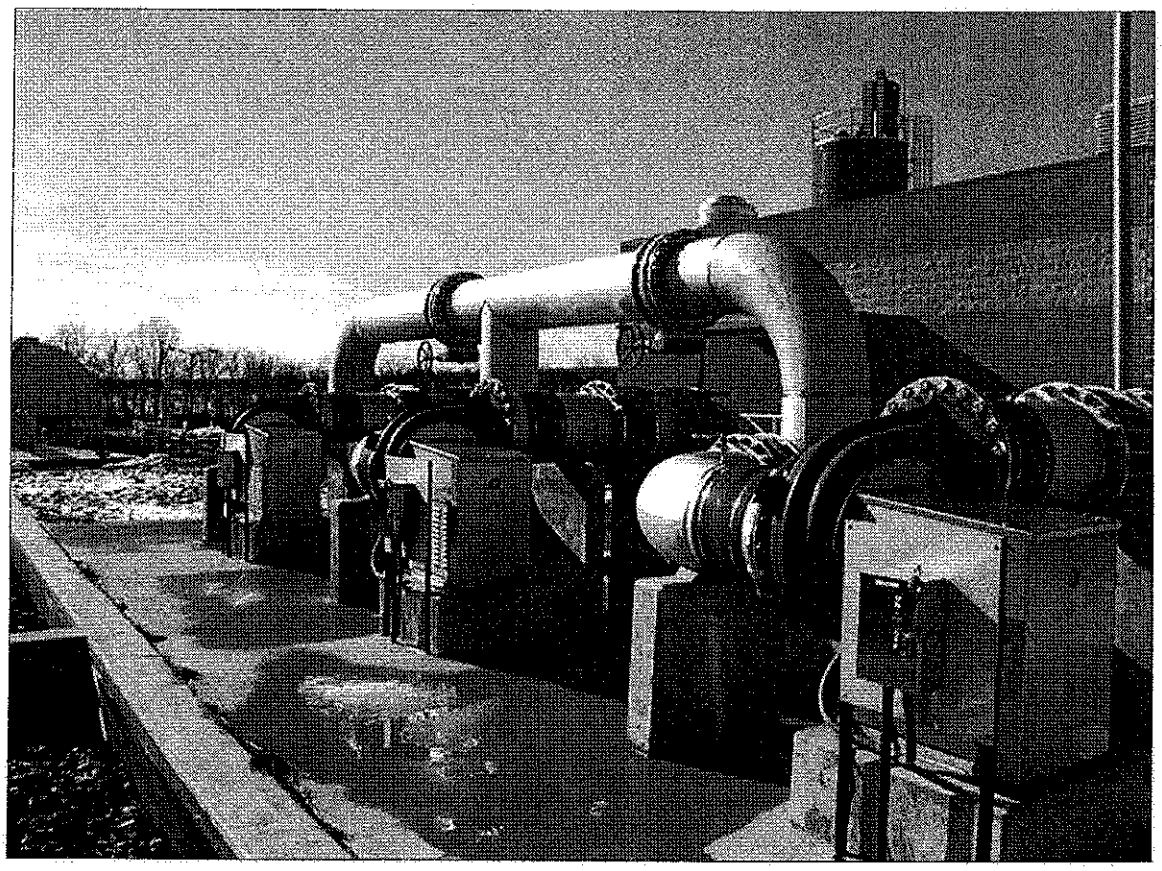
According to Chambersburg's 2009 Chapter 94 Report, 1389.2 dry tons of stabilized biosolids were generated at the WWTP in 2009. Of this quantity, 1280.99 dry tons were disposed of in a landfill with the remainder being land applied.

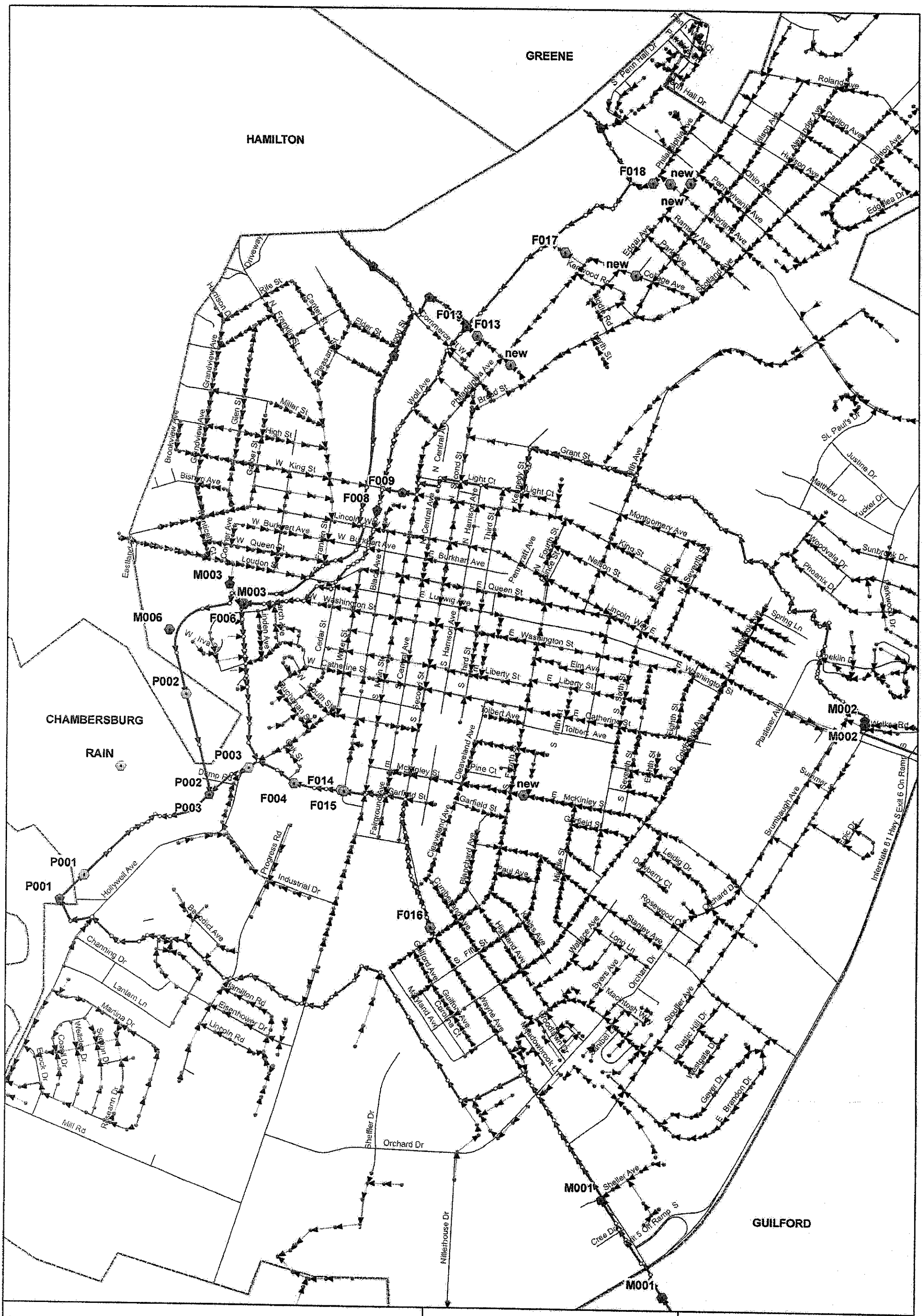
III.C.3. DISPOSAL OF WASTEWATER BIOSOLIDS

Chambersburg currently has approximately 623.3 acres of farmland available for agricultural utilization of the Class A biosolids. In addition, Chambersburg disposes of dewatered biosolids at the Blue Ridge Landfill in Franklin County. According to Chambersburg's 2009 Chapter 94 Report, approximately 92% of all biosolids generated at the WWTP were disposed of in the landfill.

As discussed in the approved TAR, the processing and disposal of wastewater sludges generated at the Chambersburg WWTP is regulated under permits administered by the PADEP. Additionally, since most parcels within Chambersburg are provided with public sewer service, little septage is generated within the Borough. This Plan will analyze alternatives for dewatering and treating sludges

produced at the WWTP. Alternatives will be considered for increasing dewatering capacity and providing more flexibility for lime addition to both waste activated sludge and anearobically digested sludge. An alternative will also be considered for treating both waste activated sludge and primary sludge together in a single process.





Legend

2009 Meter Locations	2008 Meter Locations
MUNICIPAL	MUNICIPAL VERIFICATION
PERMANENT	PERMANENT INSTALLATION
GENERAL	GENERAL

Roads
Interceptor MHs
Interceptors
Manholes
Sewers

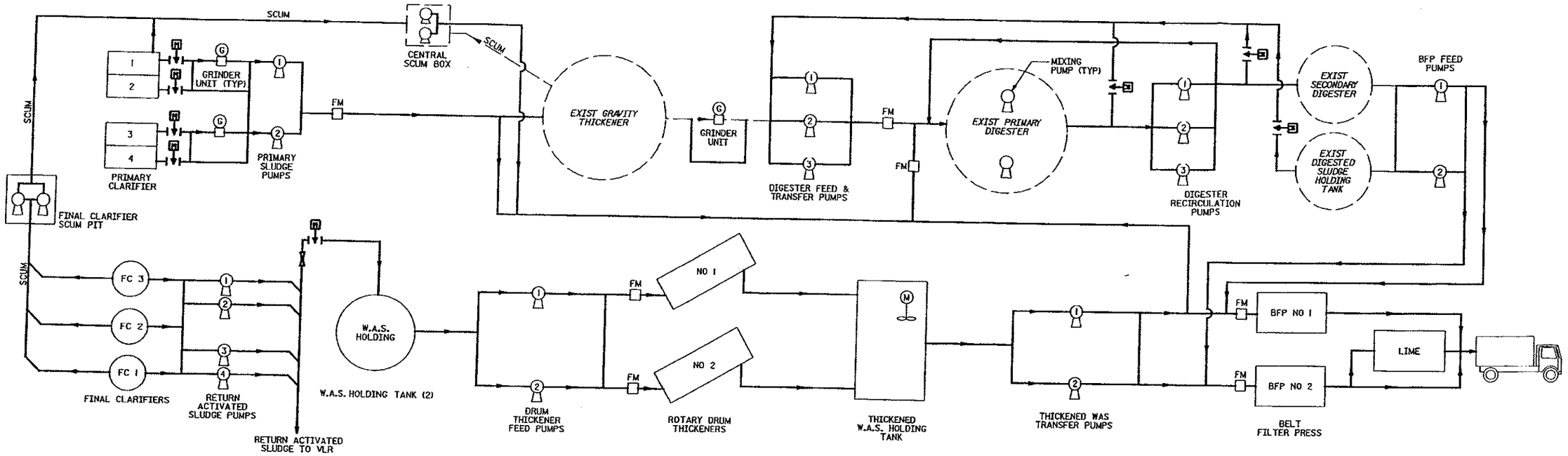
0 600 1,200 Feet

1 inch = 1,200 feet

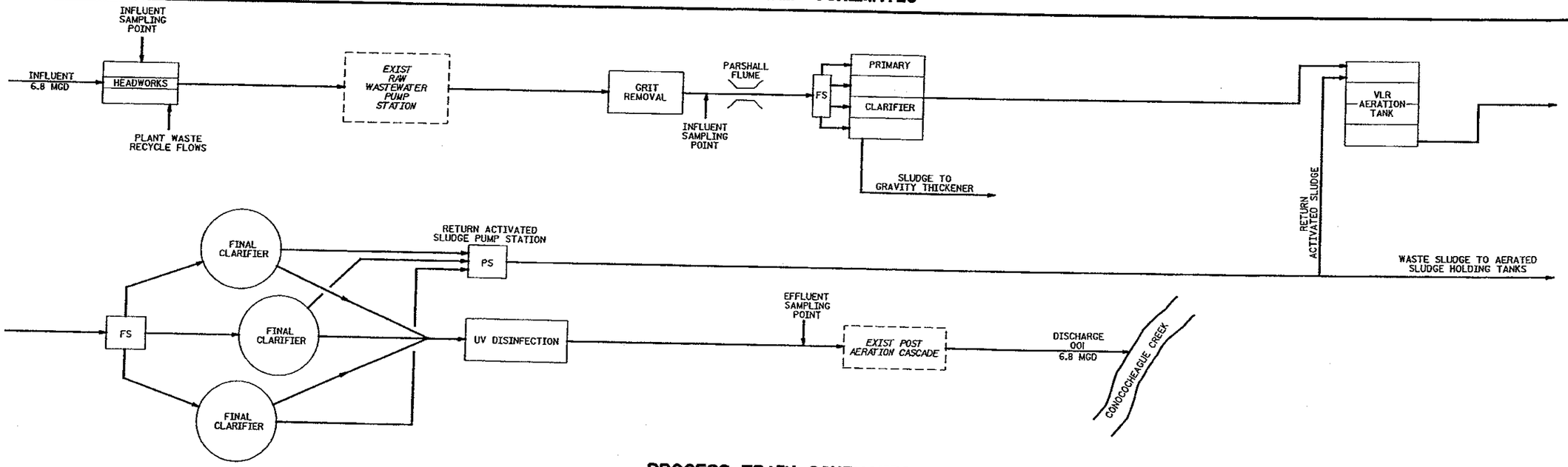
N W E S

BUCHART HORN INC

FIGURE III- 1:
Collection System Map
Act 537 Plan Update
Franklin County, Pennsylvania
BH No. 76374-00



SOLIDS TRAIN SCHEMATIC



PROCESS TRAIN SCHEMATIC

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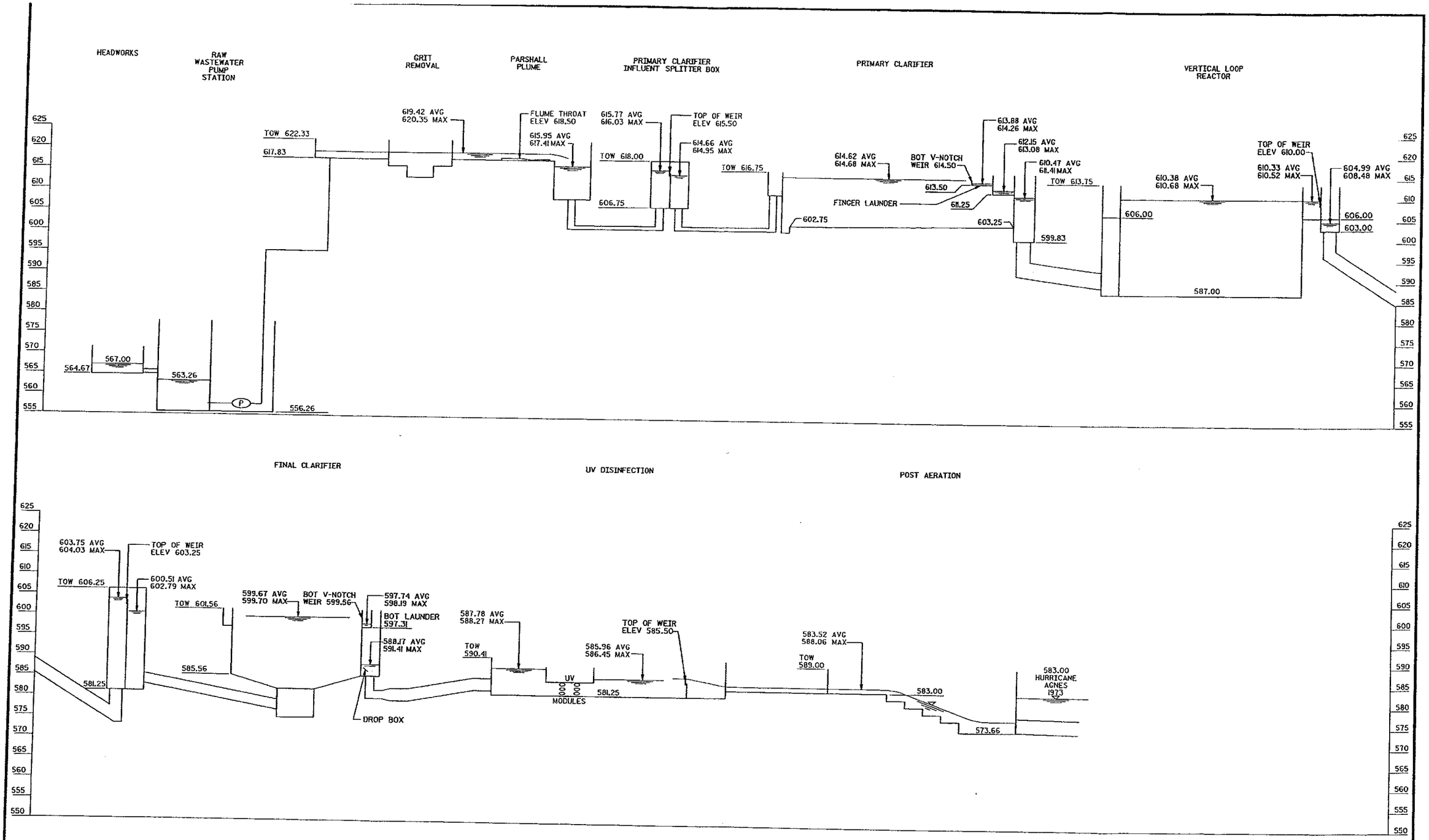

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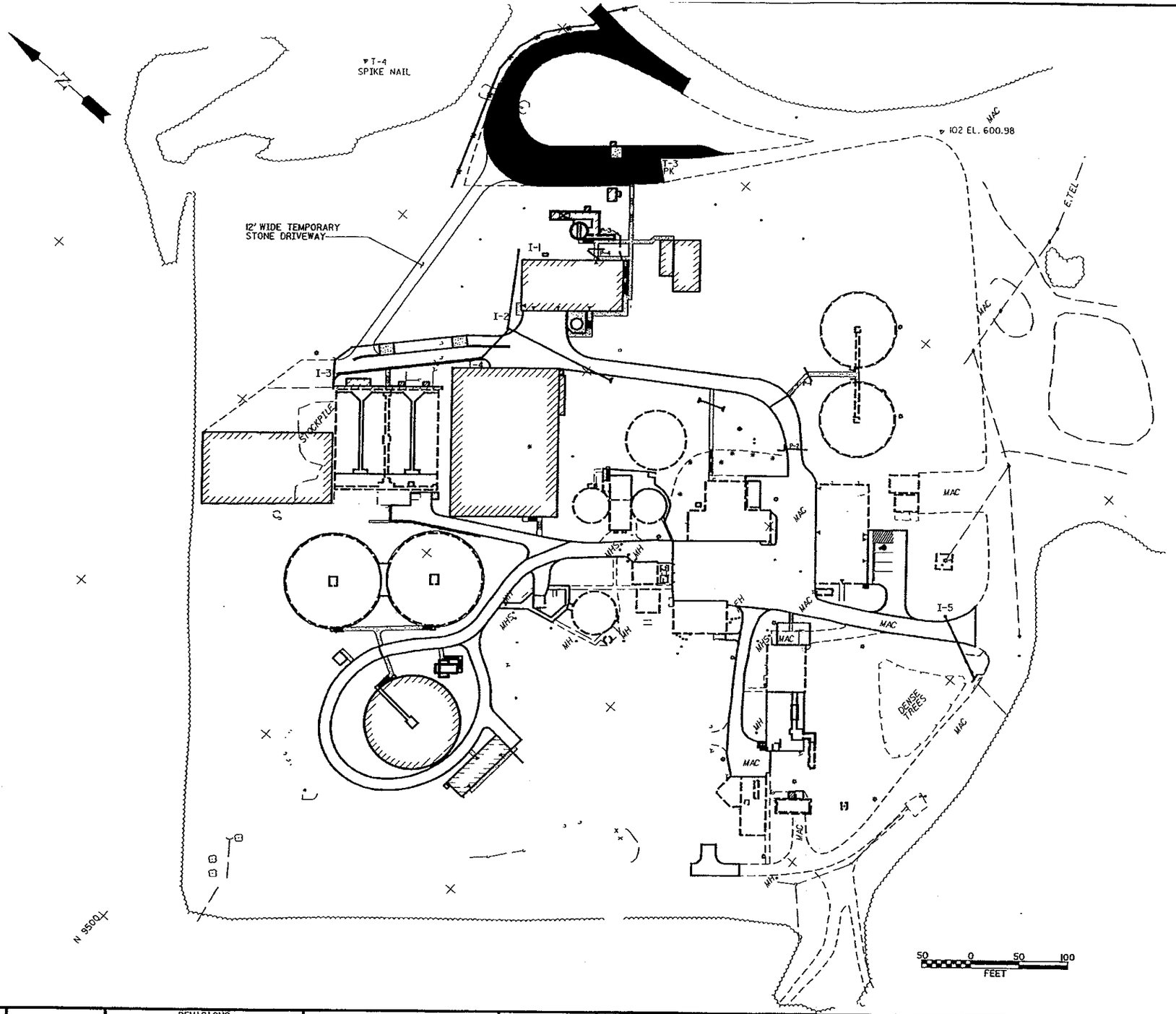
DATE 3/97								



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REVISIONS

NO.	DESCRIPTION	BY	DATE

BUCHART HORN, INC.
Consulting Engineers and Planners

BOROUGH OF CHAMBERSBURG

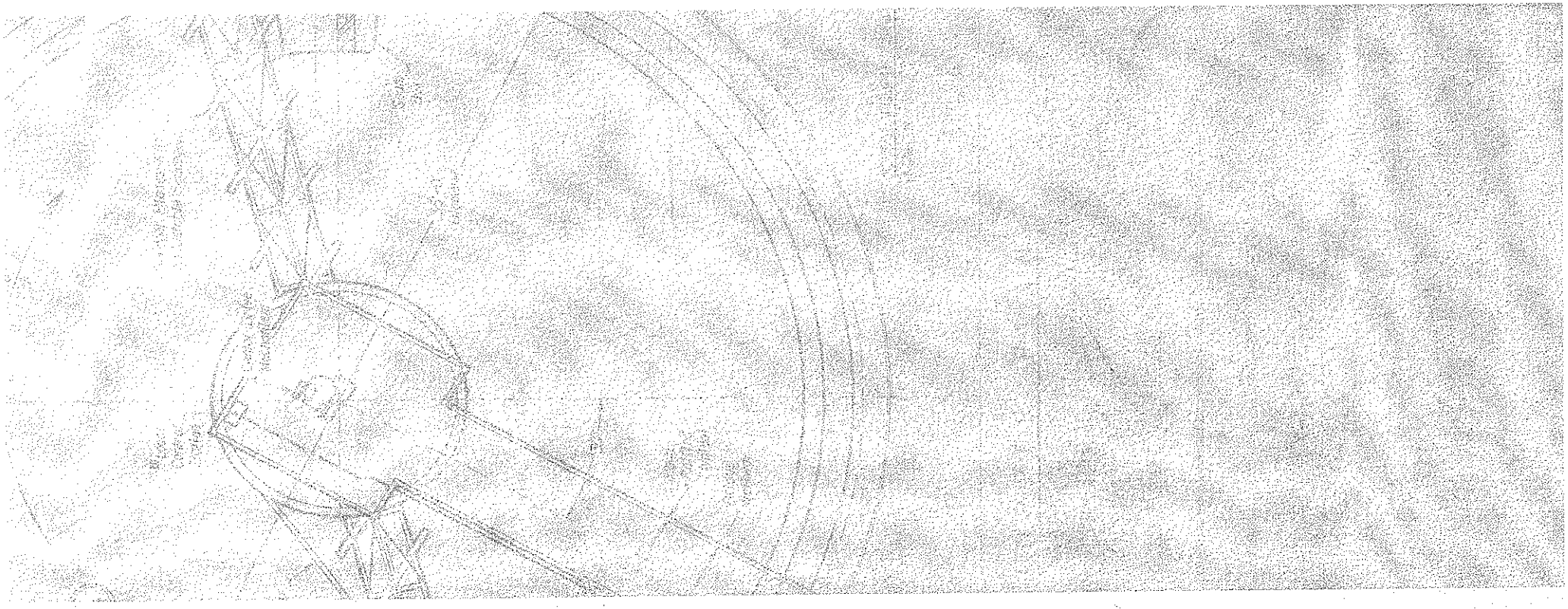
CHAMBERSBURG REGIONAL
WASTEWATER TREATMENT PLANT

FRANKLIN COUNTY PENNSYLVANIA

SITE LAYOUT PLAN

FIGURE NO. III-4
SHEET NO.
PROJECT NO. 76374-00

Section 4



IV.A. MUNICIPAL AND COUNTY PLANNING DOCUMENTS ADOPTED PURSUANT TO THE PENNSYLVANIA MUNICIPALITIES PLANNING CODE (ACT 247)

IV.A.1. LAND USE PLANS AND ZONING MAPS THAT IDENTIFY RESIDENTIAL, COMMERCIAL, INDUSTRIAL, AGRICULTURAL, RECREATIONAL AND OPEN SPACE AREAS

IV.A.1.a. CHAMBERSBURG BOROUGH ZONING ORDINANCE

The Borough of Chambersburg's Zoning Ordinance, last amended in August 2004, includes the following zoning designations:

Zoning District	Acronym
Low Density Residential	LDR
Medium Density Residential	MDR
Environmental	E
Distributed Commercial – Neighborhood Business	DCN
Distributed Commercial – Highway	DCH
Central Core Area	CC
Light Manufacturing District	LM
Medium Manufacturing District	MM
Heavy Manufacturing District	HM
Professional Office District	PO
Health Care Service District	HCS
Health Institute District	HI

The Borough's current zoning map for the Study Area is included as Figure IV-1.

IV.A.1.b. CHAMBERSBURG BOROUGH COMPREHENSIVE PLAN

The Borough maintains a Comprehensive Plan, currently being revised. Some of the community-planning goals listed in the Comprehensive Plan that are relevant to this Act 537 Plan include the following:

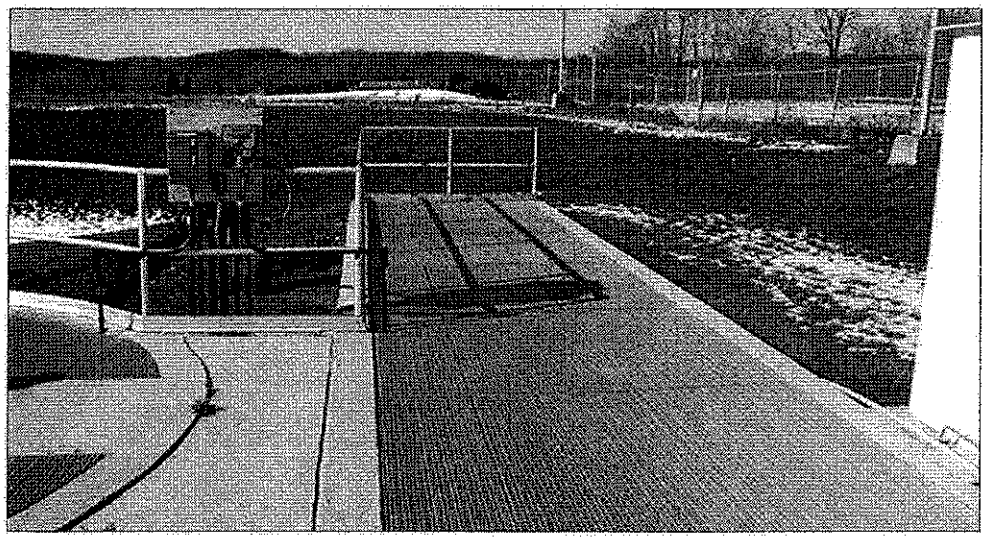
- "Limit the number of single-family residential conversions into multi-unit structures."
- "Provide for the diverse housing needs of the Borough's existing and future residents by providing for a range of housing types, affordability and densities within the Borough."
- "Identify vacant 'infill' areas within the Borough and suggest suitable development options."
- "Identify and evaluate the current character, types and locations of industrial land uses and recommend suitable area within the Borough for future industrial expansion."
- "Maximize the efficient use of the Borough's public sewer facilities and identify additional capacity needs based upon future growth projections for residential, commercial, industrial, and institutional uses."

IV.A.1.c. CHAMBERSBURG BOROUGH SUBDIVISION AND LAND DEVELOPMENT ORDINANCE

The Borough also maintains a Subdivision and Land Development Ordinance, dated September 1989. The following sections of the Ordinance are pertinent to this Act 537 Plan:

- "No subdivision or land development of any lot, tract or parcel of land shall be made, no street, sanitary sewer, storm sewer, water main or other improvements in connection therewith shall be laid out, constructed, opened or dedicated for public use... ...except in accordance with the provisions of this chapter."
- "The sketch plan shall (provide a) ...statement explaining the methods of water supply and sewage disposal to be used."
- "The applicant shall be required to connect to the Chambersburg Borough System."
- "When the Borough, in accordance with the Pennsylvania Sewage Facilities Act, Act 537 of 1966, as amended, determines the necessity for a sewer facilities plan revision or supplement, the Planning Commission shall require that notice of approval from the Pennsylvania Department of Environmental Protection be submitted as a condition of final plan approval."
- "(Final Plans shall be accompanied by) Notification from the Department of Environmental Protection that approval of the sewer facility plan revision or supplement has been granted or notice from the Borough that a plan revision or supplement is not necessary."

IV.A.1.d. FRANKLIN COUNTY LAND PLANNING DOCUMENT



The following planning document was developed by Franklin County and is applicable to all municipalities within its boundaries.

- The Franklin County Comprehensive Plan, adopted in 1999, includes an objective for new development to be directed towards areas already served or adjacent to areas served by central water and sewer systems.

IV.A.2. ZONING REGULATIONS THAT ESTABLISH LOT SIZES PREDICATED ON SEWAGE DISPOSAL METHODS

With respect to sewage disposal, the Borough's Zoning Ordinance defines the following minimum lot sizes:

- Every principal building that will not be served by public water or sewer requires a minimum lot area of 1 acre.

- Every principal building that will be served by either public water or sewer, but not both, requires a minimum lot area of 35,000 square feet.

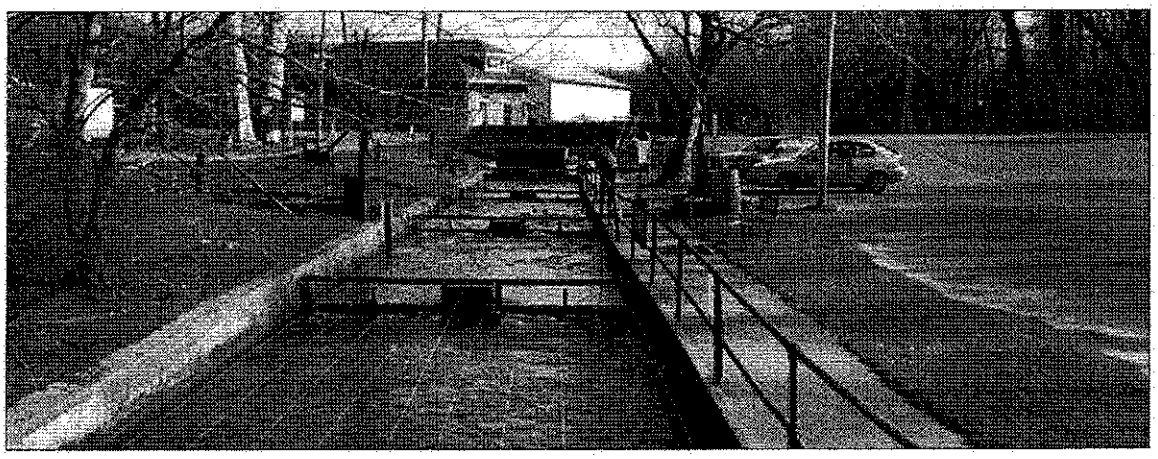
IV.A.3. LIMITATIONS AND PLANS RELATED TO FLOODPLAIN AND STORMWATER MANAGEMENT AND SPECIAL PROTECTION (CH. 93) AREAS

The Chambersburg Borough Zoning Ordinance defines Flood Districts for those areas subject to flooding during a 100-year storm event, as delineated by the Federal Emergency Management Agency (FEMA). The Flood Districts overlay the underlying zoning boundaries, and regulate the allowed land uses that are otherwise permitted by zoning.

No buildings may be built within the Floodway of Conococheague Creek. In addition, no increases in the 100-year flood plain are permitted. However, necessary utilities may be constructed within the 100-year flood plain. Any structure built within the 100-year floodplain must be "flood proofed."

Additionally, facilities used to store more than 550 gallons or pounds of the following chemicals are strictly prohibited within Floodways: acetone, ammonia, calcium carbide, carbon disulfide, celluloid, chlorine, hydrochloric acid, hydrocyanic acid, magnesium, nitric acid and oxides of nitrogen, petroleum products, phosphorous, potassium, sodium sulphur and sulphur products, pesticides (including insecticides, fungicides and rodenticides), radioactive substances (no amount permitted), and any substance that has similar effects upon water quality and public health.

The Borough's Subdivision and Land Development Ordinance provides regulations for stormwater management. These regulations mandate that a stormwater management plan be in place before any development can begin. Erosion and sedimentation controls are also included in these regulations.



IV.B. LAND DEVELOPMENT

IV.B.1. AREAS WITH EXISTING DEVELOPMENT OR PLOTTED SUBDIVISIONS

Table I-1 provided a list of all planning modules / exemptions approved by Chambersburg Borough within the past 10 years. All of the equivalent dwelling units (EDU) associated with those approvals have been constructed.

IV.B.2. LAND USE DESIGNATIONS ESTABLISHED UNDER THE PENNSYLVANIA MUNICIPALITIES PLANNING CODE

According to the Borough's Zoning Ordinance, the purpose for each zoning district is as follows:

Low Density Residential – To provide development of single-family and two-family dwellings, home occupations, farming occupations, and various public and semi-public uses outside of the downtown core. Minimum lot size is 6,000 square feet.

Medium Density Residential – To provide development of single-family, two-family dwellings, home occupations, and garden apartments surrounding the main commercial area of the Borough. Minimum lot size is based on type and varies from 625 – 5,000 square feet.

Environmental – To protect significant natural resources in the Borough residing within the corridors of the Conococheague Creek and Falling Springs, as delineated by the 100-year floodplain. Agricultural uses, campgrounds, government uses, parking lots, recreational uses, public utilities and accessory residential, commercial, and industrials are permitted by right. With the exception of municipal or public utilities, the minimum lot area is 10,000 square feet.

Distributed Commercial – Neighborhood Business – To provide existing residential neighborhoods with local convenience type commercial facilities within close proximity to the residential neighborhoods. Residential uses, dwelling and business use, retail uses, personal service, restaurants, tourist homes or mobile homes, mortuary and undertaking establishments, medical and dental clinics and laboratories, professional offices and financial institutions are permitted. Minimum lost size is 6,000 square feet.

Distributed Commercial – Highway – To provide development along Chambersburg's arterial and collector roadways. Amusement enterprises, hotels or motels, clubs, lodges, wholesale bakery and food distribution, retail, wholesale, service, repair uses, car washes, florists and nurseries, railways, bus passenger stations and express offices, mobile home and accessory uses are permitted. Minimum lot area was not established.

Central Core Area - To serve as the main area for commercial activity in the Borough. Permitted uses include any use in DCH district, public utilities and accessory uses. The CC district is bordered by Washington Street to the south, Third Street to the east, the Western Maryland Railroad to the west and Falling Spring Creek to the north. A minimum lot area *was not established.*

Light Manufacturing District – To provide textile mill products, apparel and other finished products, printing, publishing, electrical and electronics, measuring, analyzing, and controlling instruments, photographic, medical, optical, watch, and clock services. No minimum lot area is required for non-residential uses.

Medium Manufacturing District – To provide food and kindred products, tobacco manufacturing, timber and wood products, furniture and furniture service uses, paper and allied products, gas companies, ice manufacturing and storage, power generating plant, and trucking terminals, in addition to the uses found in LM.

Heavy Manufacturing District – To provide manufacturing of rubber and plastic products, stone, clay, glass and concrete products, steel fabricated metal products, selected machinery and transportation equipment, in addition to the uses found in LM.

Professional Office District – To promote professional personal services including medical, surgical or other services to individuals. Intended to limit uses to activities involving office and clerical activities as opposed to activities involving wholesaling or retailing.

Health Care Service District– To furnish the public health, safety, and welfare by providing a location for health care related uses. Permitted uses include hospitals, outpatient health clinics, pharmacies, heliport, nurse facilities, ambulance and emergency rescue services.

Health Institute District - To encourage a harmonious patter of institution development that can mutually benefit the Borough and the institution themselves. To encourage the development of health institution uses in accordance with approved standard and to promote the planning for the location of future health institutions uses serving a regional population. Permitted uses include outpatient health care clinics, professional and medical offices, medical laboratories, and rehabilitation facilities.

IV.B.3. FUTURE GROWTH

IV.B.3.a. HISTORIC POPULATION DATA

According to U.S. Census Data, the population of Chambersburg Borough has increased by approximately 1.0% between 1960 and 2000. As shown in Table IV-2, the Borough's population peaked in 2000. The population slowly decreased from the 1960s to the 1980s, then increased from the 1990s to 2000.

TABLE IV-1
HISTORIC POPULATION GROWTH IN CHAMBERSBURG BOROUGH
(1960-2000)

Year	Population	# Change	% Change
1960	17,670		
1970	17,315	(55)	(2.0%)
1980	16,174	(1,141)	(6.6%)
1990	16,674	500	2.9%
2000	17,862	1,188	6.7%

The Census also indicates that the average household size within Chambersburg Borough was 2.15 persons in the year 2000, based upon population and total housing units.

IV.B.3.b. POPULATION PROJECTIONS

The Borough's Comprehensive Plan predicts that the total population within the Borough will increase to 19,014 by the year 2010. The population is expected to increase to 26,473 by 2030. These population projections reflect an average growth rate of approximately 2 percent over the twenty-year period. An average was used as the Borough has experienced unusual growth trends over the previous forty years.

Although the Borough's population continues to age, commercial development outside the Borough and residential development within the Borough continues to attract new residents. The Comprehensive Plan's goals for population and housing include providing a broad range of housing opportunities that can meet the needs of a variety of persons. To accomplish this goal, one objective of the Comprehensive Plan is to provide adequate public facilities and services concurrent with residential development. To ensure adequate sewerage facilities are available for the growth potential recognized within the Borough, the flow computations herein have used the 10% average growth rate reflected by the approved, proposed and developable EDU's within the Borough.

Refer to Section IV.B.5.b-d for flow projections in Greene, Hamilton, and Guilford Township.

IV.B.3.c. EDU PROJECTIONS

This Chambersburg EDU projection includes estimates of future residential, commercial, industrial, and institutional connections. As shown in Table IV-2, the total number of EDU connections is projected to rise from 13,955 in 2006 to 16,090 in 2026 (2,135 new EDUs). The Residential EDU projections are derived from growth projections for the years 2011, 2016, 2021 and 2026. A flow of 216 gpd/EDU and 1.86-persons/residential unit was assumed to calculate the number of Residential EDUs.

It was assumed that 100 Commercial EDUs would connect to the collection system every five years. It was also assumed that no new Industrial EDUs would connect to the collection system in the next twenty years.

TABLE IV-2
EDU PROJECTIONS FOR RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL FACILITIES WITHIN THE BOROUGH

Type	2006	2011	2016	2021	2026
Residential EDUs	9063	10,198	10,448	10,648	10,798
Commercial EDUs	3,193	3,293	3,393	3,493	3,593
Industrial EDUs	1,699	1,699	1,699	1,699	1,699
Out of Borough EDUs	113	113	113	113	113
Borough Use	104	104	104	104	104
Total	13,955	15,190	15,540	15,840	16,090

[1] Existing EDUs per 2006 Chapter 94 Report

IV.B.4. REGULATIONS AND PLANS RELATING TO THE DEVELOPMENT, USE AND PROTECTION OF LAND AND WATER RESOURCES

Refer to Sections I.A., IV.A., and IV.B.2. for discussion of zoning, land development regulations, and planning as they pertain to resource protection within the context of wastewater systems.

IV.B.5. SEWAGE PLANNING NECESSARY TO PROVIDE ADEQUATE WASTEWATER TREATMENT FOR FIVE AND TEN YEAR FUTURE PLANNING PERIODS

IV.B.5.a. CHAMBERSBURG BOROUGH

As indicated in Section III, Title 25 Chapter 94 of the Pennsylvania Code defines "hydraulic overload" of a wastewater treatment plant (WWTP) as "The condition that occurs when the monthly average flow entering a plant exceeds the hydraulic design capacity for 3-consecutive months out of the preceding 12 months... " Therefore, the future maximum three-month flow (3MMF) to the Chambersburg WWTP has been projected.

According to the Borough's 2009 Municipal Wasteload Management (Chapter 94) Report, the 5-year average of the maximum three-month flow (3MMF) to the Chambersburg WWTP for the period of 2005 through 2009 was 6.403 million gallons per day (MGD).

As indicated in Section IV.B.3.c., it is anticipated that 2,135 additional EDUs could be constructed within the Borough and connected to the Borough wastewater system. It can be conservatively assumed that the unit 3MMF generated by new construction is 300 gallons per day (gpd) per EDU. Therefore, the wastewater flow that will be generated from future development within Chambersburg is estimated to be 640,500 gpd, or 0.641 MGD.

The Borough's 2009 contribution to the WWTP averaged 1.768 MGD. Using the assumptions described in Section IV.B.3.c., the 2009 flow projection was 3.055 MGD. Based on potential development in the Borough and the assumptions above, the 2011 flow projection is 3.32 MGD and the 2016 flow projection is 3.40 MGD. The 2021 flow projection is 3.46 MGD and the 2026 flow projection is 3.51 MGD.

IV.B.5.b. GREENE TOWNSHIP

Greene Township's 2009 contribution to the Chambersburg WWTP averaged 1.84 MGD. The Township estimated 20-year flow projections as part of their Act 537 Plan Update in early 2007. Based on potential development in the Township, the 2011 flow projection is 2.17 MGD while the 2016 flow projection is 2.58 MGD. The 2021 flow projection is 3.09 MGD while the 2026 flow projection is 3.68 MGD.

IV.B.5.c. HAMILTON TOWNSHIP

Hamilton Township's 2009 contribution to the Chambersburg WWTP averaged 0.76 MGD. The Township estimated 20-year flow projections as part of their Act 537 Plan Update in early 2007. Based on potential development in the Township, the 2011 flow projection is 0.96 MGD while the 2016 flow projection is 1.15 MGD. The 2021 flow projection is 1.35 MGD while the 2026 flow projection is 1.55 MGD.

IV.B.5.d. GUILFORD TOWNSHIP

Guilford Township's 2009 contribution to the Chambersburg WWTP averaged 0.81 MGD. The Township estimated 20-year flow projections specifically for this Act 537 Plan. Based on potential development in the Township, the 2011 flow projection is 1.11 MGD while the 2016 flow projection is 1.50 MGD. The 2021 flow projection is 1.79 GMD while the 2026 flow projection is 2.09 MGD.

IV.B.5.e. TOTAL

Based on the projections in the preceding sections, it is estimated that the average daily flow to the Chambersburg WWTP will ultimately reach 10.83 MGD in the year 2026. Therefore, the WWTP upgrade will be designed around this projected flow of 10.83 MGD. Refer to Table IV-3 for a summary of flow projections.

TABLE IV-3
FLOW PROJECTIONS FOR CHAMBERSBURG BOROUGH AND HAMILTON, GREENE, AND GUILFORD TOWNSHIPS

Municipality	2006	2011	2016	2021	2026
Chambersburg	1.768	3.320	3.400	3.460	3.51
Hamilton	0.760	0.956	1.153	1.349	1.55
Greene	1.840	2.170	1.794	3.090	3.68
Guilford	0.810	1.115	1.497	1.794	2.09

All flow projections in MGD and based on each municipality's projected development growth

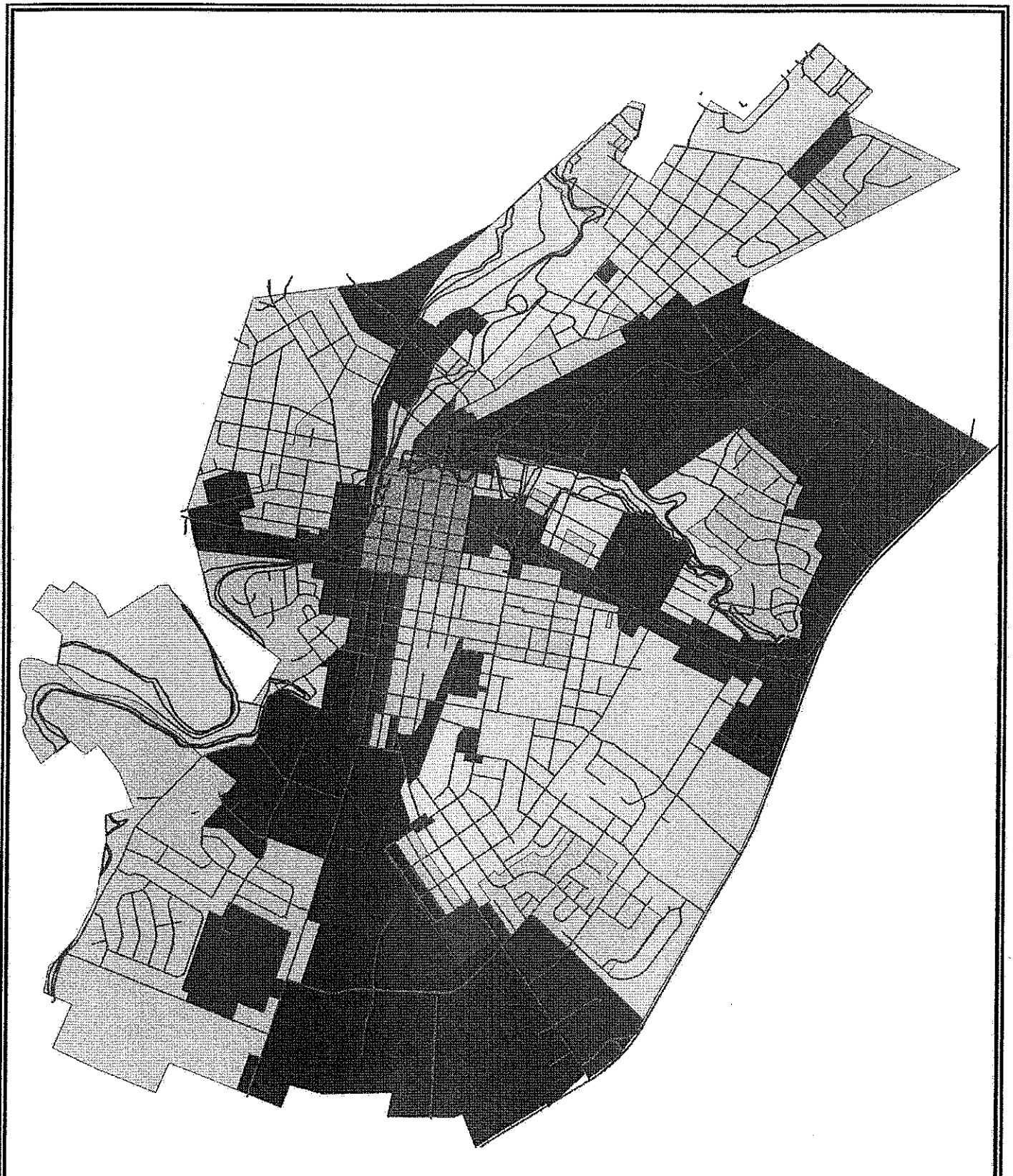


Figure IV-1:
Chambersburg Borough Zoning Map
Act 537 Plan Update
Franklin County, Pennsylvania
BH No. 76374-00

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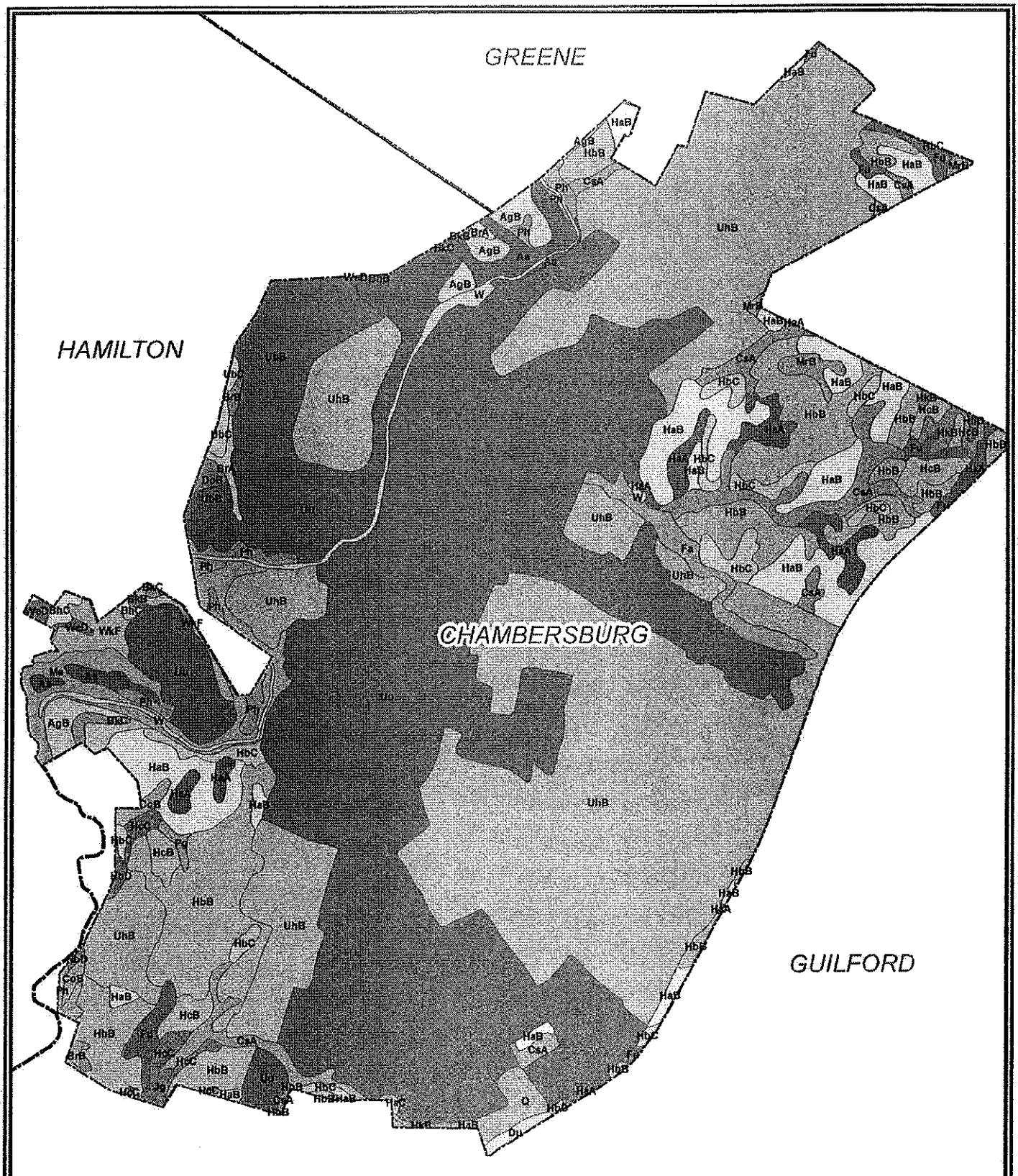

Figure IV-2:
Chambersburg Borough Soils Map
Act 537 Plan Update
Franklin County, Pennsylvania
BH No. 76374-00

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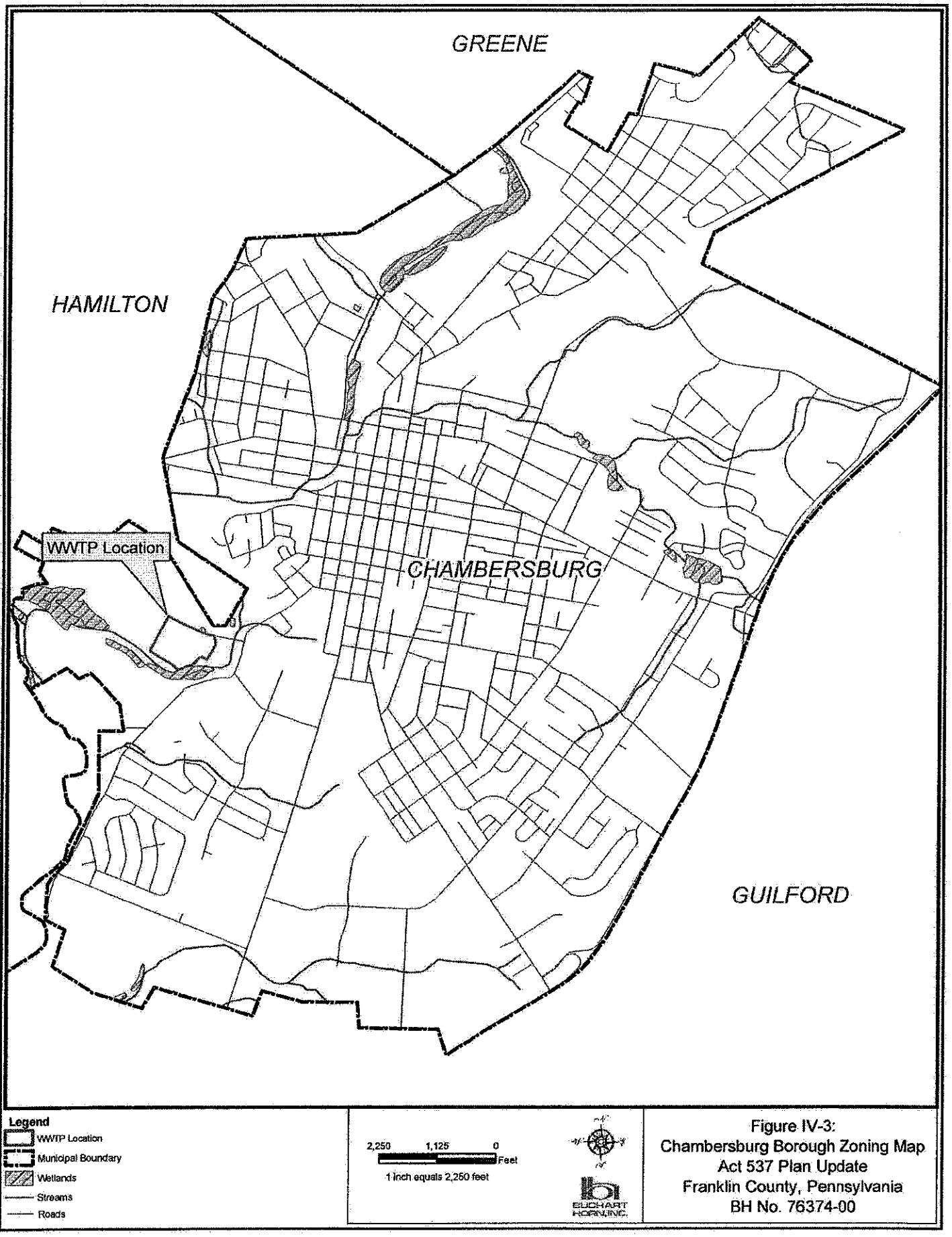

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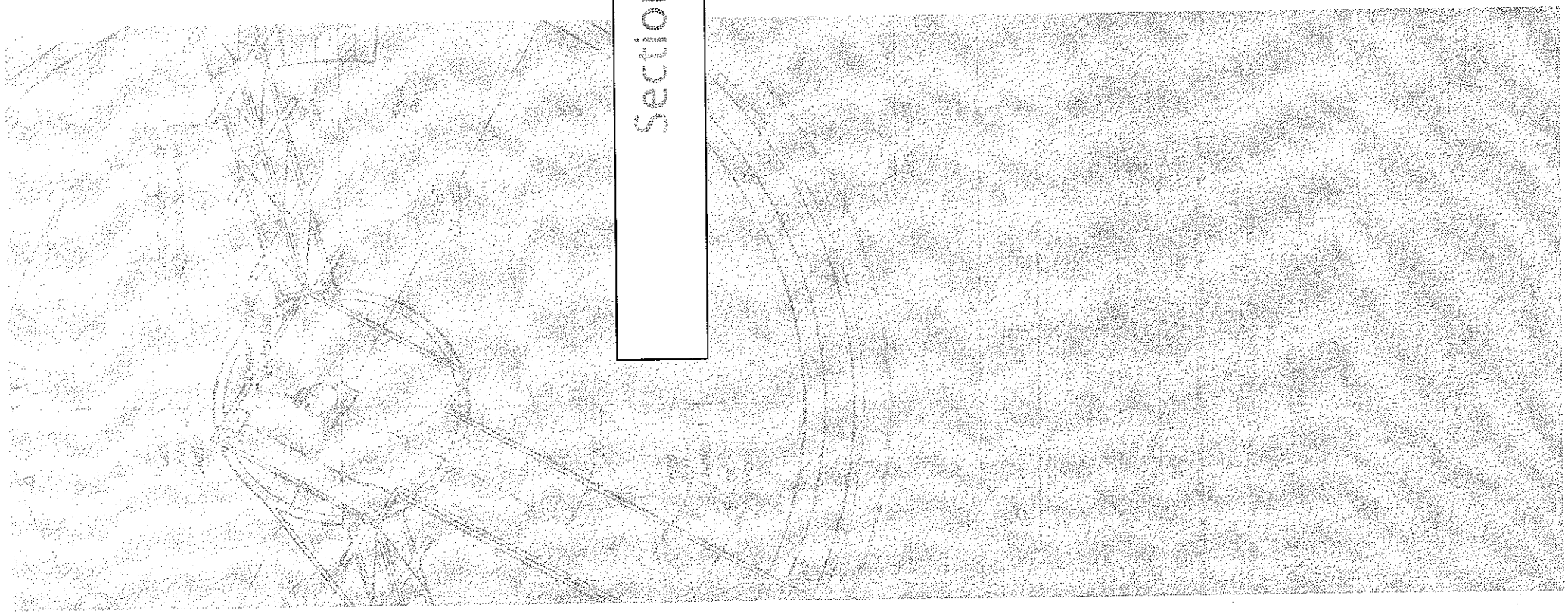
Figure IV-3:
Chambersburg Borough Zoning Map
Act 537 Plan Update
Franklin County, Pennsylvania
BH No. 76374-00

Section 5



V. Alternatives to Provide New or Improved Wastewater Disposal Facilities

V.A. CONVENTIONAL COLLECTION, CONVEYANCE, TREATMENT AND DISCHARGE ALTERNATIVES

V.A.1. REGIONAL WASTEWATER TREATMENT ALTERNATIVES

Since the purpose of this Plan is to analyze alternatives for expansion and nutrient removal at the existing Chambersburg WWTP, no discussion of new regional wastewater collection, conveyance, or treatment systems is proposed.

V.A.2. EXTENSION OF EXISTING SEWAGE FACILITIES TO AREAS IN NEED OF NEW OR IMPROVED SEWAGE FACILITIES

The vast majority of properties within Chambersburg Borough are already connected to the public sewer system. Therefore, as indicated in the Task Activity Report, no discussion of any potential Borough-initiated extensions of the sewer collection and conveyance system is included in this Plan.

V.A.3. ALTERNATIVES THAT INCLUDE THE CONTINUED USE OF EXISTING MUNICIPAL OR NON-MUNICIPAL SEWAGE FACILITIES

The Chambersburg WWTP is located within the Chesapeake Bay watershed, and will therefore be subject to Total Phosphorous (TP) and Total Nitrogen (TN) limits of the recently adopted Chesapeake Bay Tributary Strategy.

PADEP's recently adopted regulations will require the owners of existing municipal wastewater plants with permitted capacities greater than 0.4 million gallons per day (MGD) to cap the discharge of TP and TN to 0.8 mg/L and 6.0 mg/L, respectively, at the design flow of the plant. At the existing 6.8 MGD design flow, the annual TP and TN loading caps for the plant will be 16,560 pounds and 124,199 pounds, respectively. This is equivalent to an average daily TP and TN caps of approximately 45 pounds per day (lbs/d) and 340 lbs/d, respectively. Using those loading caps and proposed design flow of 10.83 MGD, the actual TP and TN effluent loadings will be 0.50 mg/L and 3.77 mg/L, respectively. This represents a 37% reduction in the effluent concentration for these nutrients.

The current facility cannot meet nutrient removal requirements and the projected increased flows, therefore an upgrade and expansion is necessary. To meet the facilities new NPDES permit the Borough will upgrade the existing facility to meet the Total nitrogen and Total Phosphorous annual cap loads.

V.A.3.a. PURCHASE OF NUTRIENT CREDITS

The Borough reviewed the possibility of purchasing credits as required to meet the total phosphorous and total nitrogen annual cap loads. It is estimated that the credits required will be 95,841 pounds per year for TN and 19,872 pounds per year of TP. These figures are based on the design flow of the plant (6.8 MGD) and the difference between average monthly discharge concentration (TN: 10.63 mg/l; TP: 1.76 mg/l) and the concentration (TN: 6.0 mg/l; TP: 0.8 mg/l) that the annual cap load is based upon. The total phosphorous limit could be met by

chemical addition with a metal salt to precipitate out the phosphorous with credit purchase if necessary.

The removal of nitrogen from the waste stream requires biological treatment, and as such cannot be met by chemical addition. Thus, without any improvements to the treatment process, credits will be required to offset the approximately 96,000 pounds of nitrogen discharged above the TN annual cap load. Currently there are 68,122 pounds of TN credits within the Potomac River watershed per the PA DEP Nutrient Trading website. The available credits currently only meet approximately 70% of the Borough's wastewater treatment plant need, thus the Borough will need to upgrade the existing process to provide denitrification unless other credits become available in the Pennsylvania portion of the Potomac Drainage Basin or DEP permits use of credits outside of Pennsylvania in the Potomac Drainage Basin. Another consideration is the need for a structural change in the nutrient credit program to permit a buyout of the nutrient credits for the life of the plant so that annual purchase of credits at an unknown price is no longer required. The purchase of any TN credits will be on as required basis.

For reference, the PA DEP Nutrient Trading website can be found at:

http://www.dep.state.pa.us/river/Nutrient%20Trading.htm?chesapeakeNav=|

V.A.3.b. UPGRADE OF THE EXISTING VLR SYSTEM

Under this alternative, the Borough will upgrade the biological process at the WWTP to meet the TN and TP annual cap loads.

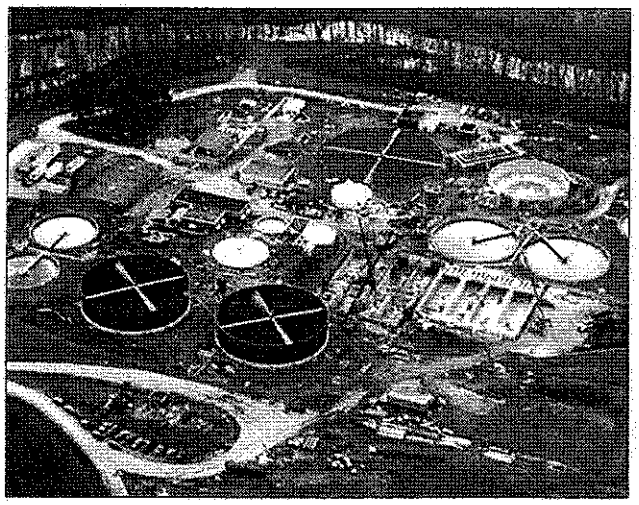
Construction of a anaerobic tank upstream of the VLR to promote the growth of polyphosphate accumulating organisms (PAOs) and the formation of volatile fatty acids in an environment absent of oxygen and nitrates. This tank will receive the influent flow from the primary clarifiers and mix with the recycle flow from the first aerated anoxic tank of the VLR system. This tank will be mixed with a surface mixer to minimize addition of oxygen to the water.

Flow from the anaerobic selector would then enter the vertical loop reactor system where one or more of the initial VLR tanks would be operated as aerated anoxic reactors, while the final VLR tank operated in an aerobic state. The existing coarse bubble aeration grids and surface disk aerators will remain to promote mixing and provide oxygen as required by the process. The first aerated anoxic tank of the vertical loop reactor will receive MLSS recycle from the aerated (final) tank of the vertical loop reactor.

Addition of a metal salt may be required to supplement the biological phosphorous removal. This metal salt addition will be configured to allow for multiple injection points to allow for minimization of chemical dosage while maximizing phosphorous removal. In addition to this chemical phosphorus system, soluble carbon in the form of methanol or similar material will be injected as the wastewater exits the VLR system and enters the anoxic selector. To minimize chemical dosing of soluble carbon, the facility will explore the possibility of diverting a portion of the primary clarifier effluent to the anoxic tank.

To meet the effluent nitrogen limits, an anoxic tank would be installed downstream of the vertical loop reactor. Each anoxic tank would be equipped with a mixer to promote mixing of the nitrate rich MLSS with the soluble carbon source to promote conversion to nitrogen gas. This anoxic tank will also contain two wall pumps to transfer denitrified MLSS to the anaerobic selector.

A re-aeration tank would then follow the anoxic tank in order to increase the dissolved oxygen concentration in the effluent stream. The re-aeration tans would be equipped with a coarse bubble grid to increase the oxygen concentration.



it is anticipated that a metal salt addition to the anaerobically digested sludge before dewatering would be required to precipitate any phosphorous released in the anaerobic digesters. This would minimize the phosphorous load on the biological process. This precipitated phosphorous would remain with the solids and be disposed of accordingly.

With these proposed renovations to the existing WWTP, it is anticipated that an effluent TN concentration of 6.0 mg/L and an effluent TP concentration of 0.8 mg/L could be achieved at a design flow rate of 6.8 MGD.

With the installation of the new process equipment, it appears that the existing 800-ampere electrical service that supplies the WWTP will be inadequate. Therefore, a new 1,200-amp service will be required, along with associated miscellaneous upgrades to the electrical equipment at the facility. Additionally, a new, larger emergency generator will need to be installed to replace the existing 30-year old unit.

This alternative was dismissed from further consideration for the following reasons:

- Expected 20-year growth in the contributing townships requires an upgrade in capacity.

V.A.3.c. EXPANSION OF THE EXISTING VLR SYSTEM

This alternative deals with the Borough proceeding with the construction of a second VLR system to handle the projected increase in flow. These process upgrades would involve the following modifications:

Under this alternative, a new vertical loop reactor system, final clarifier splitter box modifications, and temporary piping modifications would be constructed. The VLR system best utilizes the site space and existing structures, is estimated to be the cheapest to construct, and will ensure current treatment capability during construction.

Expansion of the WWTP to the projected 10.83 MGD flow will involve the installation of a new vertical loop reactor. This new vertical loop reactor system would be the same size and volume as the existing system.

As part of this flow expansion the existing influent headworks will be rehabilitated by replacing the existing channel macerator with a bar screen unit to remove solids. This unit will remove screenings to a screw conveyor system that will wash and dewater the screenings before disposing of them in a dumpster for disposal in a sanitary landfill. The manual bar screen in the existing bypass channel will be replaced with an in channel grinder unit that will shred influent material. The parshall flume located downstream of the screening unit will be replaced with a unit sized for the peak wet weather flow rates.

A second wet well will be constructed at the wastewater treatment plant influent pump station for the installation of two additional variable speed submersible pumps. Additionally, one of the centrifugal pumps will need to be removed to allow for the installation of connector pipe between the influent tank of the pump station and the new wet well.

A second grit chamber, sized to match the existing unit, will be installed to handle the increased flows. This grit from this unit will be collected and discharged to container for disposal in a sanitary landfill. The de-gritted water will flow through the parshall flume installed with this grit chamber and discharge to the primary clarifiers.

A splitter box with adjustable weirs will be installed after the primary clarifiers to allow for the primary clarifier effluent to be split between the two vertical loop reactors, one existing and one new. The adjustable weirs will allow flow portioning based upon operator input and isolation of a vertical loop reactor system for maintenance.

The splitter box for the final clarifiers would be modified to handle the additional inflow from the second VLR system. In addition two additional effluent weirs will be installed to allow for flow distribution between the five final clarifiers (3 existing and two new).

Two new eighty-eight (88) foot diameter circular final clarifiers will be constructed next to the three existing clarifiers of the same size. These clarifiers will handle the combined flow from both vertical loop reactors, efficiently removing the MLSS from the water for return or wasting.

A new return activated sludge (RAS) and waste activated sludge (WAS) pump station and blower building would be constructed in order to recycle the activated sludge into the initial anoxic basin of the second VLR train or to waste the sludge. This new RAS pump station would handle activated sludge from proposed Final Clarifiers No. 4 and No. 5. The existing RAS/WAS pump station would continue to handle sludge from existing Final Clarifiers No. 1, 2, and 3.

With these proposed renovations to the existing WWTP, it is anticipated that an effluent TN concentration of 3.76 mg/L and an effluent TP concentration of 0.50 mg/l cannot be achieved at a design flow rate of 10.83 MGD. However, the selected alternative will provide adequate treatment during high flows.

With the installation of the new process equipment, it appears that the existing 800-ampere electrical service that supplies the WWTP will be inadequate. Therefore, a new 1,200-amp service will be required, along with associated miscellaneous upgrades to the electrical equipment at the facility. Additionally, a new, larger emergency generator will need to be installed to replace the existing 30-year old unit.

This alternative was dismissed from further consideration for the following reasons:

- With these proposed renovations to the existing WWTP, it is anticipated that an effluent TN concentration of 3.76 mg/L and an effluent TP concentration of 0.50 mg/l cannot be achieved at a design flow rate of 10.83 MGD.

V.A.3.d. UPGRADE AND EXPANSION OF THE EXISTING VLR SYSTEM

This selected alternative deals with the Borough proceeding with the upgrade of the existing VLR system to meet the TN and TP annual Cap loads and the concurrent expansion of the facility to handle the projected increase in flow.

The process upgrade would utilize the existing vertical loop reactor (VLR) with modifications to meet the required nutrient removal. A process flow diagram, hydraulic profile, and site plan of the chosen alternative are included as Figures V-1 through V-3, respectively. These process upgrades would involve the following modifications:

Under this alternative the new vertical loop reactor system with anaerobic, anoxic and re-aeration tanks, final clarifier splitter box modifications, and temporary piping modifications would be constructed first to allow the facility to comply with the NPDES permit regarding total phosphorous and total nitrogen within the time frame allotted. The modification of the original VLR and other site improvements would then follow to allow for a complete installation

As indicated in the Plan Summary, the alternatives that allow for modification and expansion to the vertical loop reactor system were chosen for the biological upgrade of the treatment plant. The VLR system best utilizes the site space and existing structures, is estimated to be the cheapest to construct, and will ensure current treatment capability during construction.

Expansion of the WWTP to the projected 10.83 MGD flow will involve the installation of a new vertical loop reactor with anaerobic, anoxic and re-aeration tanks as described in Section V.A.3.a. This new VLR tankage would be the same size and volume as the existing tanks to allow for more efficient treatment of the wastewater.

As part of this flow expansion the existing influent headworks will be rehabilitated by replacing the existing channel macerator with a bar screen unit to remove solids. This unit will remove screenings to a screw conveyor system that will wash and dewater the screenings before disposing of them in a dumpster for disposal in a sanitary landfill. The manual bar screen in the existing bypass channel will be replaced with an in channel grinder unit that will shred influent material. The parshall flume located downstream of the screening unit will be replaced with a unit sized for the peak wet weather flow rates.

A second wet well will be constructed at the wastewater treatment plant influent pump station for the installation of two additional variable speed submersible pumps. Additionally, one of the centrifugal pumps will need to be removed to allow for the installation of connector pipe between the influent tank of the pump station and the new wet well.

A second grit chamber, sized to match the existing unit, will be installed to handle the increased flows. This grit from this unit will be collected and discharged to container for disposal in a sanitary landfill. The de-gritted water will flow through the parshall flume installed with this grit chamber and discharge to the primary clarifiers.

A splitter box with adjustable weirs will be installed after the primary clarifiers to allow for the primary clarifier effluent to be split between the two vertical loop reactors, one existing and one new. The adjustable weirs will allow flow portioning based upon operator input and isolation of a vertical loop reactor system for maintenance.

As stated above, a new vertical loop reactor with anaerobic, anoxic and re-aeration tanks will be constructed.

The splitter box for the final clarifiers would be modified to handle the additional inflow from the second VLR system. In addition two additional effluent weirs will be installed to allow for flow distribution between the five final clarifiers (3 existing and two new).

Two new eighty-eight (88) foot diameter circular final clarifiers will be constructed next to the three existing clarifiers of the same size. These clarifiers will handle the combined flow from both vertical loop reactors, efficiently removing the MLSS from the water for return or wasting.

A new return activated sludge (RAS) and waste activated sludge (WAS) pump station and blower building would be constructed in order to recycle the activated sludge into the initial anoxic basin of the second VLR train or to waste the sludge. This new RAS pump station would handle activated sludge from proposed Final Clarifiers No. 4 and No. 5. The existing RAS/WAS pump station would continue to handle sludge from existing Final Clarifiers No. 1, 2, and 3.

Addition of a metal salt may be required to supplement the biological phosphorous removal. This metal salt addition will be configured to allow for multiple injection points to allow for minimization of chemical dosage while maximizing phosphorous removal. In addition to this chemical phosphorus system, soluble carbon in the form of methanol or similar material will be injected as the wastewater exits the VLR system and enters the anoxic selector. To minimize

chemical dosing of soluble carbon, the facility will explore the possibility of diverting a portion of the primary clarifier effluent to the anoxic tank.

It is anticipated that a metal salt addition to the anaerobically digested sludge before dewatering on the belt filter presses would be required to precipitate any phosphorous released in the anaerobic digesters. This would minimize the phosphorous load on the biological process. This precipitated phosphorous would remain with the solids and be disposed of accordingly.

With these proposed renovations to the existing WWTP, it is anticipated that an effluent TN concentration of 3.76 mg/L and an effluent TP concentration of 0.50 mg/l could be achieved at a design flow rate of 10.83 MGD. The selected alternative will provide adequate treatment during high flows.

With the installation of the new process equipment, it appears that the existing 800-ampere electrical service that supplies the WWTP will be inadequate. Therefore, a new 1,200-amp service will be required, along with associated miscellaneous upgrades to the electrical equipment at the facility. Additionally, a new, larger emergency generator will need to be installed to replace the existing 30-year old unit.

V.A.3.e. CONSTRUCTION OF AN AQUAPASS© SYSTEM

Another alternative considered in the evaluation of nutrient removal options for the Chambersburg WWTP involved the construction of AquaPASS System with cloth media filter. Under this phased activated sludge design produced by Aqua-Aerobic Systems, Inc., the four existing VLR basins would be converted to AquaPASS reactors to form "Train 1." An additional two new reactors would be constructed to form "Train 2." Each "train" would have an anaerobic reactor, phase separator, and pre-anoxic basin.

Staged aeration would occur in the four existing 141' x 25' biological reactors and the two new 124' x 78' reactors. These basins would handle the average design flow of 10.83 MGD and the peak design flow of 21.66 MGD. The proposed system would be able to biologically meet the required total nitrogen effluent limit. In addition to biologically means, chemical addition and filtration would be required in order to meet the phosphorus effluent limit.

After exiting the existing primary clarifiers, the wastewater would enter the anaerobic reactors of either Train 1 or Train 2. Both anaerobic reactors would be equipped with 7.5 HP direct drive mixers. After sufficient mixing is achieved, the effluent of the anaerobic reactors would then enter the AquaPASS reactors. Each of the two new basins would be equipped with one 40 HP direct drive mixer, two 10 HP submersible pumps, fixed fine bubble diffusers, and nine 250 HP positive displacement blowers.

Upon leaving the staged aeration basins, the wastewater would enter a pre-anoxic reactor consisting of one 10 HP direct drive mixer and three 10 HP submersible pumps. After achieving sufficient mixing, the wastewater would encounter the existing secondary clarifiers.
The existing VLR trains would also be converted to new AquaPASS reactors and would contain similar mixers, pumps, and blowers.

To ensure that the phosphorous limit was consistently met, two AquaDiamond cloth media filtration basins would need to be constructed. These basins would have an approximate footprint of 120 feet in length by 50 feet in width.

This alternative was dismissed from further consideration for the following reasons:

- There is little space available on the existing plant site to feasibly construct the two new AquaPASS reactors, which would have approximate overall dimensions of 124 feet long by 78 feet wide.
- There is little space available on the existing plant site to feasibly construct an AquaDiamond Basin.
- The proposed system would not meet an effluent TP concentration of 0.50 mg/L at the design flow of 10.83 MGD without the addition of chemicals.

V.A.3.f. CONSTRUCTION OF A KRUGER BIOSTYR® SYSTEM

A sixth alternative considered in the evaluation of nutrient removal options for the Chambersburg WWTP involved using the existing activated sludge system. Under this design produced by Kruger, the source water for the proposed BIOSTYR system would be the effluent from this activated sludge system. The BIOSTYR system removes total nitrogen through two stages: the first stage for tertiary nitrification and the second stage for denitrification with methanol addition.

The BIOSTYR system is an up-flow submerged fixed-film filter designed for BOD removal, nitrification, and denitrification. Upon entering the system, the influent wastewater is pumped to a common inlet feed channel above the BIOSTYR cells. After flowing into the individual cells by gravity, the wastewater is forced upwards into filter media. Active biomass covers the high-density polystyrene beads contained in the cells, forcing the BOD to become oxidized. As the wastewater continues up the filter, additional BOD is consumed while initializing nitrification. The treated water then enters a common reservoir above the filters, thus completing this first treatment stage.

The second treatment stage involves denitrification. During this stage, methanol is added to the influent from the common reservoir above the filters. This additional carbon source initializes denitrification as the wastewater passes through the filters, thereby converting nitrate to nitrogen gas.

This alternative was dismissed from further consideration for the following reasons:

- There is no space available on the existing plant site to construct new oxidation ditches, which would have approximate overall dimensions of 180 feet long by 110 feet wide.
- The proposed system likely could not meet an effluent TP concentration of 0.50 mg/L at an average flow of 10.83 MGD.

V.A.3.g. CONSTRUCTION OF AN IFAS SYSTEM

The construction of an Integrated Fixed-film Activated Sludge (IFAS) system was also considered for the upgrade and expansion of the Chambersburg WWTP. IFAS systems alter the conventional activated sludge plant by increasing the overall solids inventory. This IFAS system involves introducing media elements to provide surface area for additional biological growth. These systems combine the benefits of fixed films systems into the suspended growth activated sludge process.

There are two main IFAS systems available: fixed media IFAS systems and dispersed media IFAS systems. The fixed media system utilizes fabric media constructed in a web configuration or rope-like material. This media is attached to rigid frames or assembled into modules that are placed within the activated sludge tank. Dispersed systems use porous or plastic finned-cylinder shapes that are suspended in the activated sludge tank.

This alternative was dismissed from further consideration for the following reasons:

- There is no space available on the existing plant site to construct this new tankage.

V.A.3.h. SOLIDS DEWATERING AND HANDLING

Three new dewatering alternatives were analyzed for the WWTP upgrade and expansion:

- Alternative 1: Thermal Process Systems' ThermAer™ with anaerobic digestion.
- Alternative 2: Thermal Process Systems' ThermAer™ without anaerobic digestion.
- Alternative 3: Replacement of existing belt filter presses and expansion of current sludge handling components to meet increased solids generation.

The first two alternatives are based upon using Thermal Process Systems ThermAer™ ATAD (Autothermal Thermophilic Aerobic Digestion) process to produce a Class A biosolid product from a commingled waste stream consisting of WAS and primary clarifier sludge. In addition, it is estimated that the solids reduction would be approximately 50% of the volume that can be expected from the current solids handling systems. Of the two possible configurations, the Thermal Process Systems' ThermAer™ with anaerobic digestion, was chosen as the new WWTP solids dewatering and handling process. A site layout for the two alternatives is included in Figures V-3 and V-4. A process flow diagram for the two alternatives is included in Figures V-5 and V-6.

Solids dewatering and handling Alternatives #1 and #2 use the patented ThermAer™ system, a process capable of producing a virtually pathogen and odor free, stabilized Class 'A' biosolids material. Under this ThermAer™ system, both alternatives utilize three ThermAer™ reactors, two transfer pumps, two SNDR tanks, one BiofiltAer™ odor control system, two belt filter press (BFP) pumps, and two belt filter presses. The Class 'A' sludge can then be hauled by truck for land applying.

Both alternatives requires three new ThermAer™ reactors, each with dimensions of 40' wide x 60' long x 24' deep with a sidewall depth of 18.' Both alternatives also require two SNDR tanks at a diameter of 70 feet and depth of 12 feet. Each alternative will also utilize a 30' x 60' x 10'

concrete BiofiltAer™ odor control unit. The SNDR and BiofiltAer™ units work together to serve two major functions: cool the hot off-gas and sludge to ensure biologically activity is possible, remove ammonia and other soluble compounds in the off-gas, and to provide a containment area to house the biofilter media. After exiting the SNDR tanks, the treated sludge would be injected with a metal salt and polymer before entering the belt filter press pumps.

Alternative 3 is based upon maintaining the existing solids handling processes. The current process has been described in Section III.A.2.h. "Solids Dewatering and Handling" and would require an approximate 65% increase in solids dewatering capacity. This would translate into replacing the two existing 2-meter belt filter presses with three new 3-meter presses. The polymer and lime feed systems will need to be modified or replaced to accommodate the increase in dewatering capacity and the multiple press configuration.

The current WAS holding tanks are of sufficient capacity to handle the increase in generated solids and still maintain sufficient residence time for volatile suspended solids reduction. The primary anaerobic digester volume would need to be doubled to maintain the minimum solids retention time of 15 days necessary for Class B Biosolids generations.

This last alternative was discussed with Borough and plant personnel and was deemed inappropriate to meet the needs of the Borough, as these changes would require significant space requirements that are currently not available on the site for the solids handling processes. In addition, this alternative would not effectively reduce the volume of solids being generated and ultimately disposed of, which is a significant cost to the Borough and contributing Townships.

Under the chosen alternative, Thermal Process Systems' ThermAer™ with anaerobic digestion (Alternative 1), the existing WAS tanks would be retrofitted into the new SNDR tanks. The existing digested sludge holding tank would then be converted to a new thickened WAS holding tank. Alternative 2 would have required the conversion of the primary and secondary anaerobic digesters into the new SNDR tanks. In both alternatives, the BiofiltAer™ odor control unit would be located near the constructed SNDR tanks.

V.A.4. ALTERNATIVES THAT INCLUDE REPAIR OR REPLACEMENT OF EXISTING COLLECTION AND CONVEYANCE SYSTEM COMPONENTS

As indicated previously, the Borough is conducting a separate interceptor and collection system study and may repair and replace specific portions of the collection and conveyance system at a later date. The proposed alternatives evaluation and potential projects are included in the implementation schedule for this Plan. In addition, there is an existing Consent Order and Agreement that specifically addresses the evaluation of the interceptors and collection system. See the attached Consent Order Agreement .

V.A.5. ALTERNATIVES THAT INCLUDE CONSTRUCTION OF NEW COMMUNITY SEWAGE SYSTEMS

As indicated previously, no new community sewer systems are proposed within Chambersburg Borough.

V.A.6. INNOVATIVE / ALTERNATIVE METHODS OF COLLECTION / CONVEYANCE TO SERVE NEEDS AREAS USING EXISTING WASTEWATER TREATMENT FACILITIES

Since no collection system extensions are anticipated, no discussion of the collection and conveyance systems is required.

V.B. INDIVIDUAL SEWAGE DISPOSAL SYSTEM ALTERNATIVES

As indicated in the PADEP-approved TAR for this 537 Plan, no discussion related to the construction of new individual sewage disposal systems is included.

V.C. SMALL FLOW TREATMENT FACILITY ALTERNATIVES

As with Section V.B., no discussion related to the construction of new small flow treatment facilities (SFTF) is included.

V.D. COMMUNITY ON-LOT SEWAGE DISPOSAL ALTERNATIVES

Again, no discussion of new Community On-lot Sewage Disposal Systems (COLDS) is included.

V.E. RETAINING TANK ALTERNATIVES

No discussion of the potential use of retaining tanks is included as part of this Plan.

V.F. SEWAGE MANAGEMENT PROGRAM

As indicated in the approved TAR, no discussion of Sewage Management Programs is included.

V.G. NON-STRUCTURAL COMPREHENSIVE PLANNING ALTERNATIVES

As with Section V.F., no discussion of the Borough's comprehensive planning, as it pertains to sewage facilities planning, is included.

V.H. NO-ACTION ALTERNATIVE

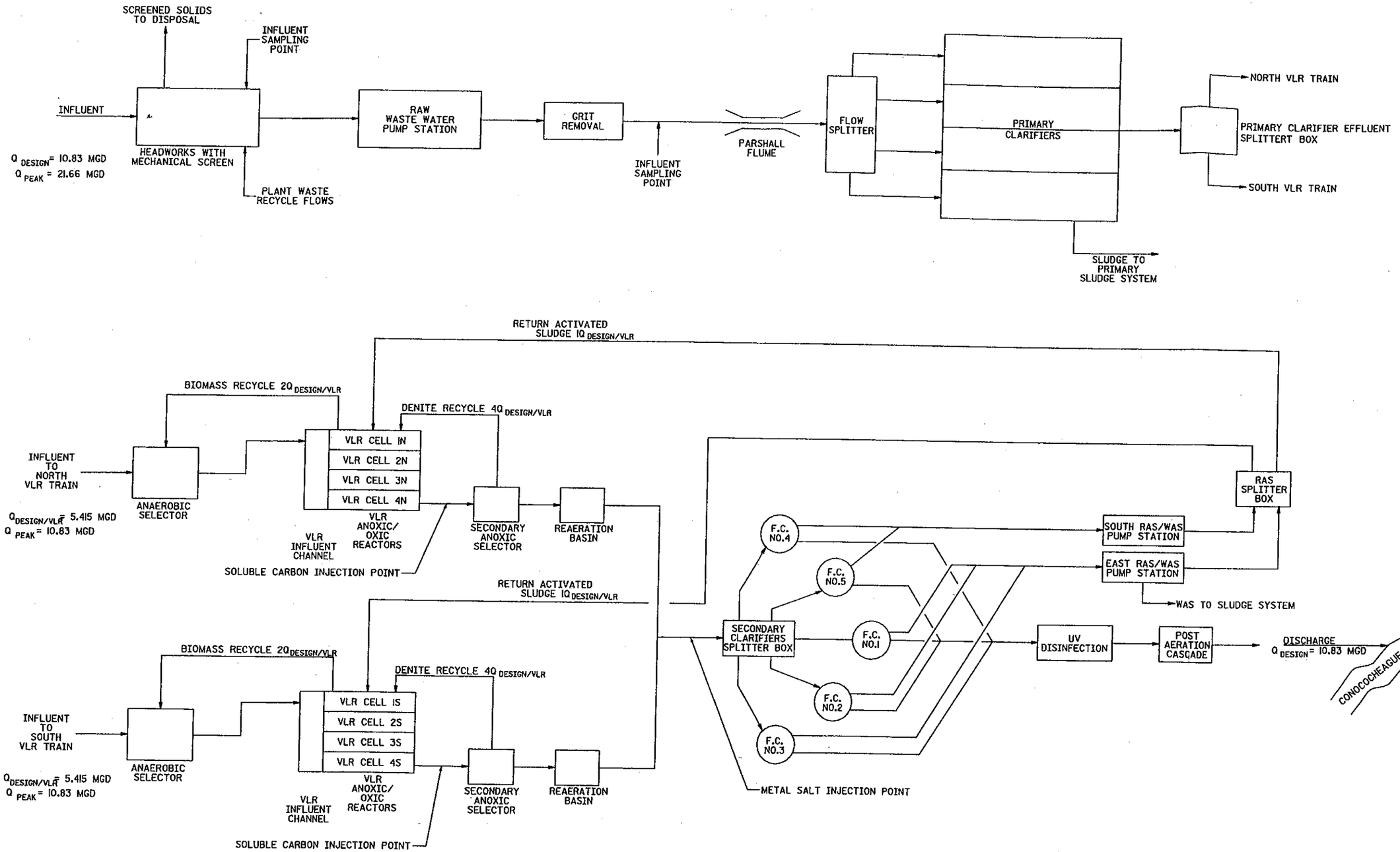
As a result of the Commonwealth's Chesapeake Bay Strategy, the PADEP has issued a new NPDES permit for the Chambersburg WWTP that will require compliance with the new effluent TN and TP limits by August 2011.

If the Borough were to select a "no-action" alternative to address the pending nutrient limits, they would be faced with fines and a Consent Order and Agreement (COA) administered by the PADEP.

Additionally, the PADEP would likely impose a moratorium, preventing new connections to the Chambersburg wastewater system. Such a moratorium would have some negative impact on the Borough's growth and revitalization efforts, as outlined in its Comprehensive Plan. In addition,

this moratorium would have a very negative impact on the growth potential in the surrounding townships that discharge into the Chambersburg collection basin.

The potential to purchase credits to meet the Total Nitrogen and Total Phosphorous limits is not favored at this time, as the Borough cannot project the costs and or future availability of these credits. Therefore, unless there is a material change in the credit program (such as being permit to purchase credits in Maryland or a structural change in the credit program) the Borough plans to proceed with the construction of one of the alternatives that involve the existing vertical loop reactor system.



CHAMBERSBURG WWTP PROCESS FLOW SCHEMATIC

LEGEND

- OVERFLOW
- UNDERFLOW

BUCHART HORN, INC.
Engineers, Architects and Planners

BOROUGH OF CHAMBERSBURG

CHAMBERSBURG REGIONAL WASTEWATER TREATMENT PLANT ALTERATIONS

PROCESS FLOW SCHEMATIC

NO.	REVISION	BY	DATE

PROJECT NO.: 76374-00
CAD FILE:
ENGR./ARCH.: MCP
DESIGN BY: AC
DRAWN BY: KS
CHECKED BY:
DATE: 3-07

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DRAWING SHALL NOT BE SCALED.

SHEET TITLE

FIGURE V-1

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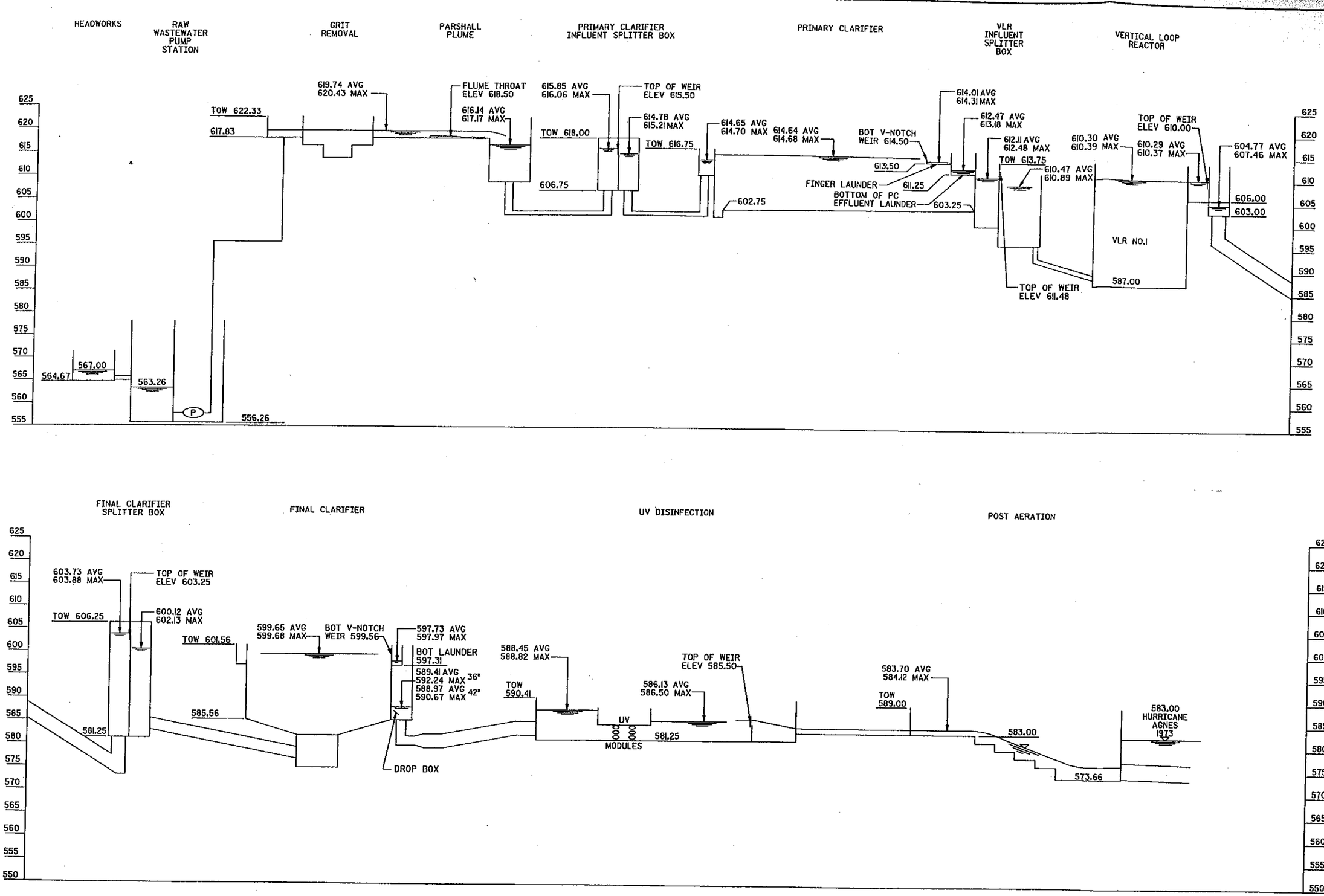


HYDRAULIC PROFILE

BUCHART HORN, INC.
Engineers, Architects and Planners

BOROUGH OF CHAMBERSBURG

CHAMBERSBURG REGIONAL WASTEWATER TREATMENT PLANT ALTERATIONS

HYDRAULIC PROFILE

NO.	REVISION	BY	DATE

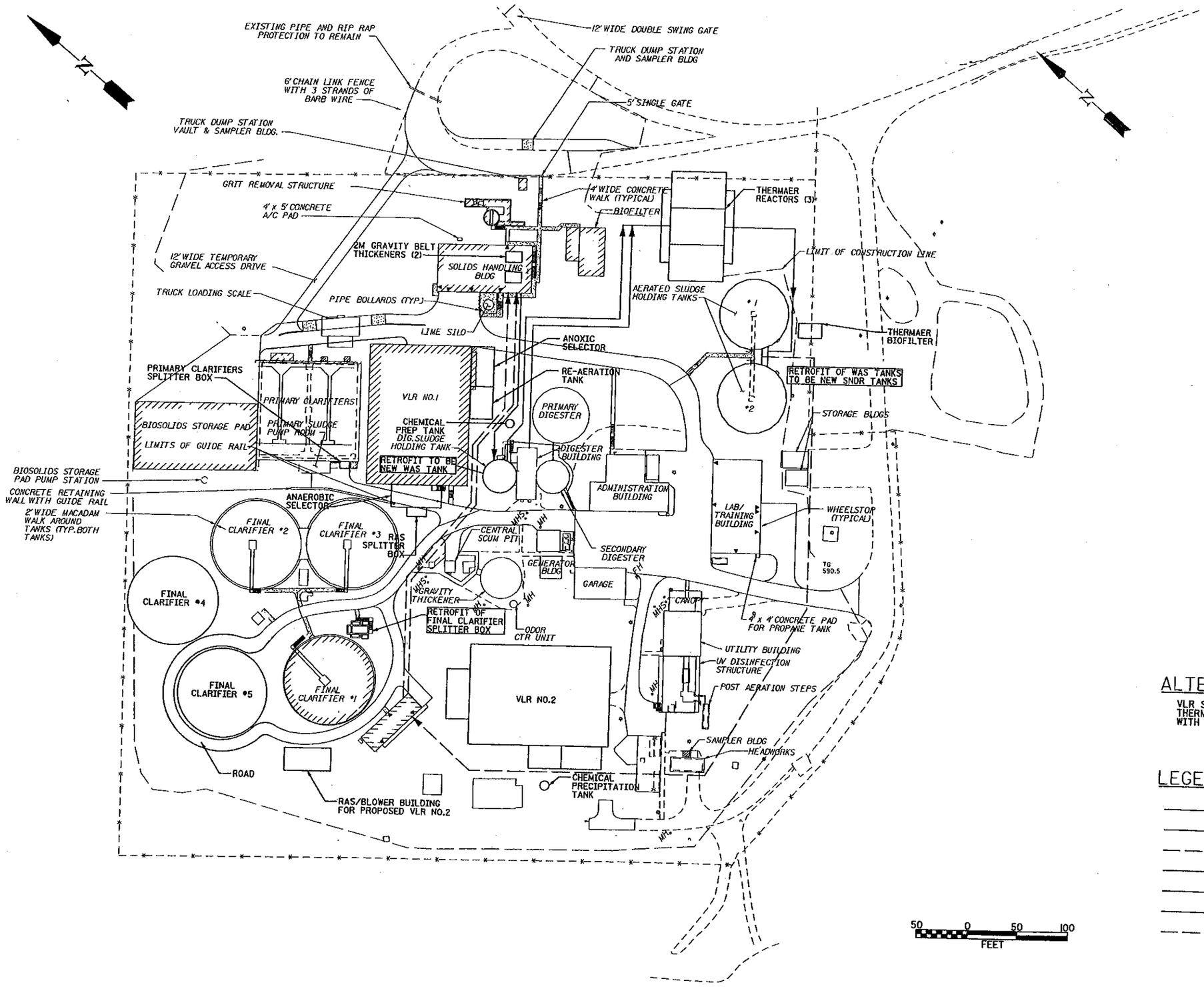
PROJECT NO.: 76374-00
CAD FILE:
ENGR./ARCH.: MCP
DESIGN BY: AC
DRAWN BY: KS
CHECKED BY:
DATE: 3-07

SHEET TITLE

FIGURE V-2

DRAWING NO.

SHEET OF



ALTERNATIVE # 1

VLR SYSTEM
THERMAER
WITH ANAEROBIC DIGESTION SYSTEM

LEGEND

- PROPOSED CONSTRUCTION
- RETROFIT
- UNTHICKENED WAS
- THICKENED WAS
- PRIMARY DIGESTED SLUDGE
- COMBINED SLUDGES
- CLASS A SLUDGE

BUCHART HORN, INC.
Engineers, Architects and Planners

BOROUGH OF CHAMBERSBURG

CHAMBERSBURG REGIONAL WASTEWATER TREATMENT PLANT ALTERATIONS

NO.	REVISION	BY	DATE

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DATE: 3-07

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SHEET TITLE

FIGURE V-3

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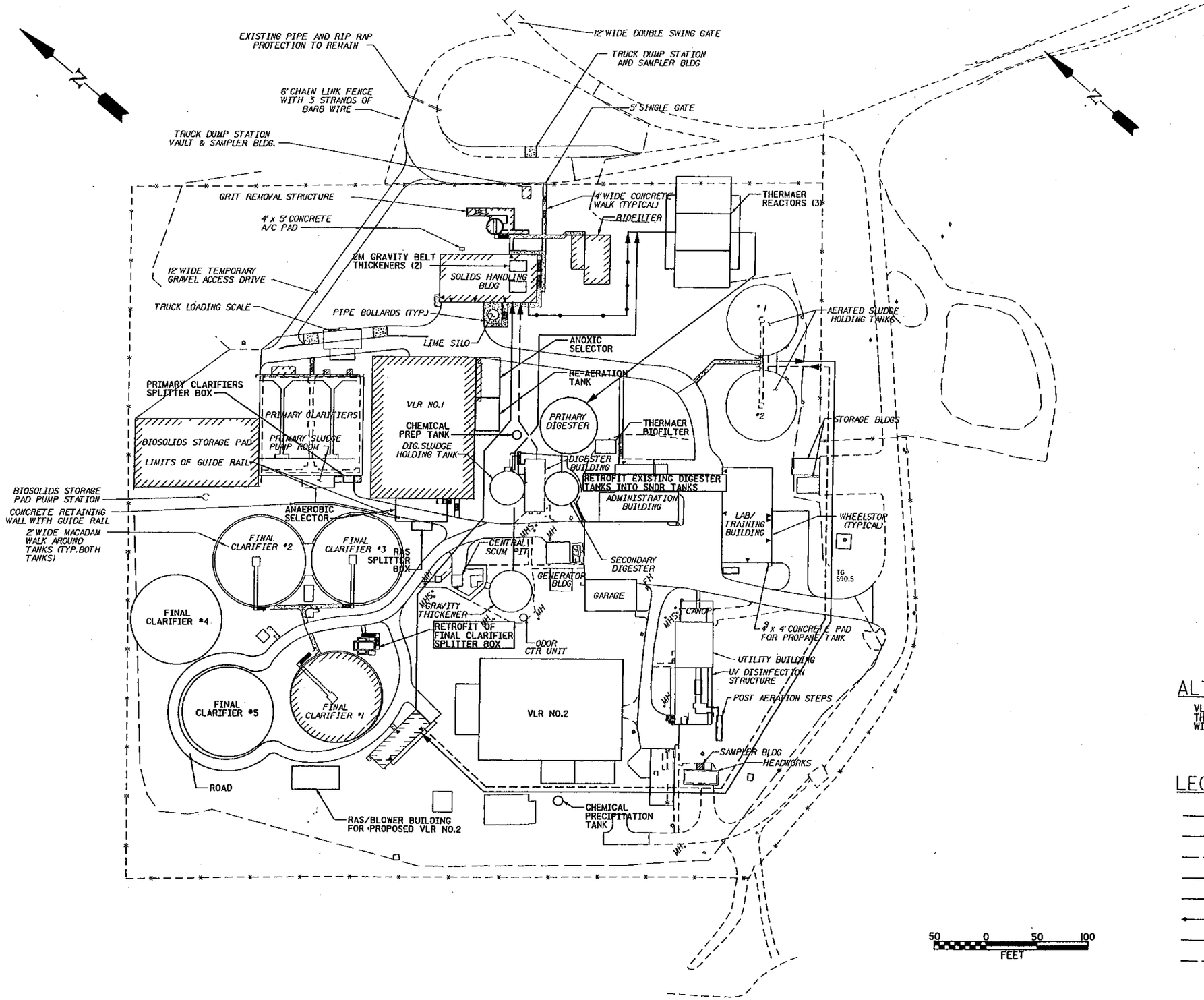

ALTERNATIVE #2

VLR SYSTEM
THERMAER
WITHOUT ANAEROBIC SYSTEM

LEGEND

- PROPOSED CONSTRUCTION
- RETROFIT
- UNTHICKENED WAS
- THICKENED WAS
- PRIMARY DIGESTED SLUDGE
- GRAVITY BELT THICKENED WAS
- COMBINED SLUDGES
- CLASS A SLUDGE

BUCHART HORN, INC.
Engineers, Architects and Planners

BOROUGH OF CHAMBERSBURG

CHAMBERSBURG REGIONAL WASTEWATER TREATMENT PLANT ALTERATIONS

NO.	REVISION	BY	DATE

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DATE: 3-07

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SHEET TITLE

FIGURE V-4

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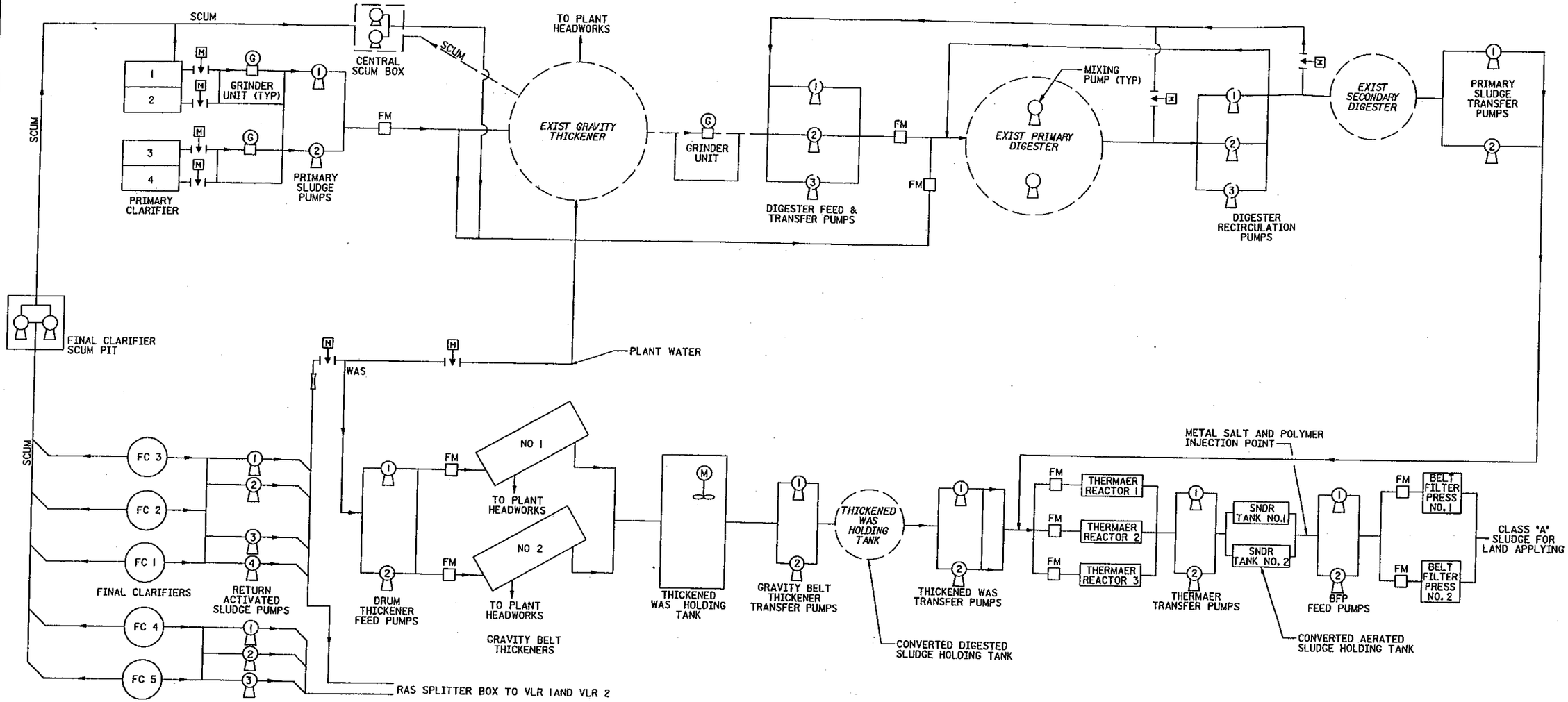

SOLIDS FLOW SCHEMATIC ALTERNATIVE I
THERMAER WITH ANAEROBIC DIGESTION SYSTEM

BUCHART HORN, INC.
Engineers, architects and Planners

BOROUGH OF CHAMBERSBURG

CHAMBERSBURG REGIONAL
WASTEWATER TREATMENT PLANT
ALTERATIONS

SOLIDS FLOW SCHEMATIC - ALTERNATIVE I

NO.	REVISION	BY	DATE

PROJECT NO.: 76374-00
CAD FILE:
ENGR./ARCH.: MCP
DESIGN BY: AC
DRAWN BY: KS
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DATE: 3-07

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SHEET TITLE

FIGURE V-5

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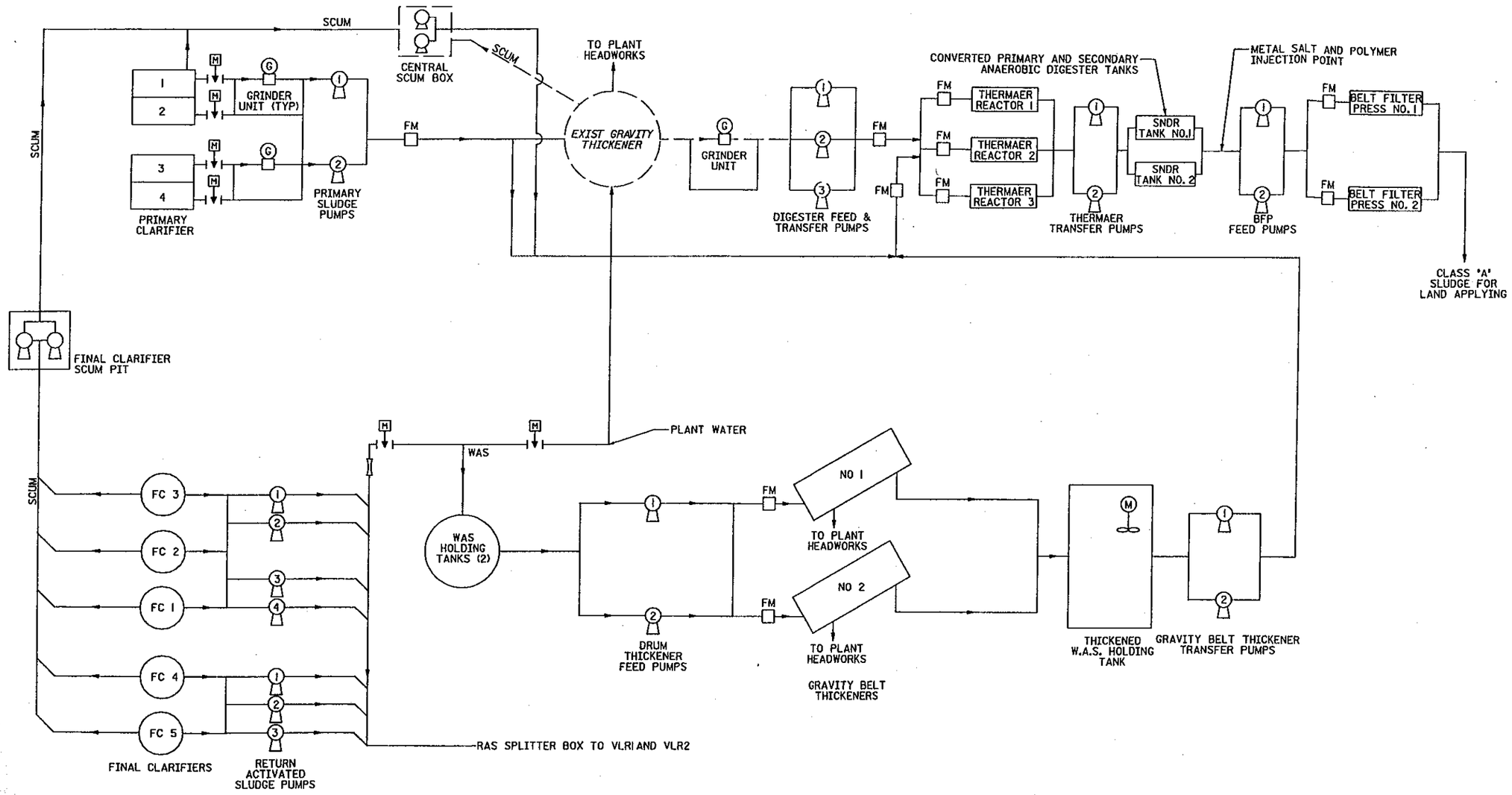

SOLIDS TRAIN SCHEMATIC ALTERNATIVE 2
THERMAER WITHOUT ANAEROBIC DIGESTION SYSTEM

BUCHART HORN, INC.
Engineers, Architects and Planners

BOROUGH OF CHAMBERSBURG

CHAMBERSBURG REGIONAL
WASTEWATER TREATMENT PLANT
ALTERATIONS

SOLIDS FLOW SCHEMATIC - ALTERNATIVE 2

NO.	REVISION	BY	DATE

PROJECT NO.: 76374-00
CAD FILE:
ENGR./ARCH.: MCP
DESIGN BY: AC
DRAWN BY: KS
CHECKED BY:
DATE: 3-07

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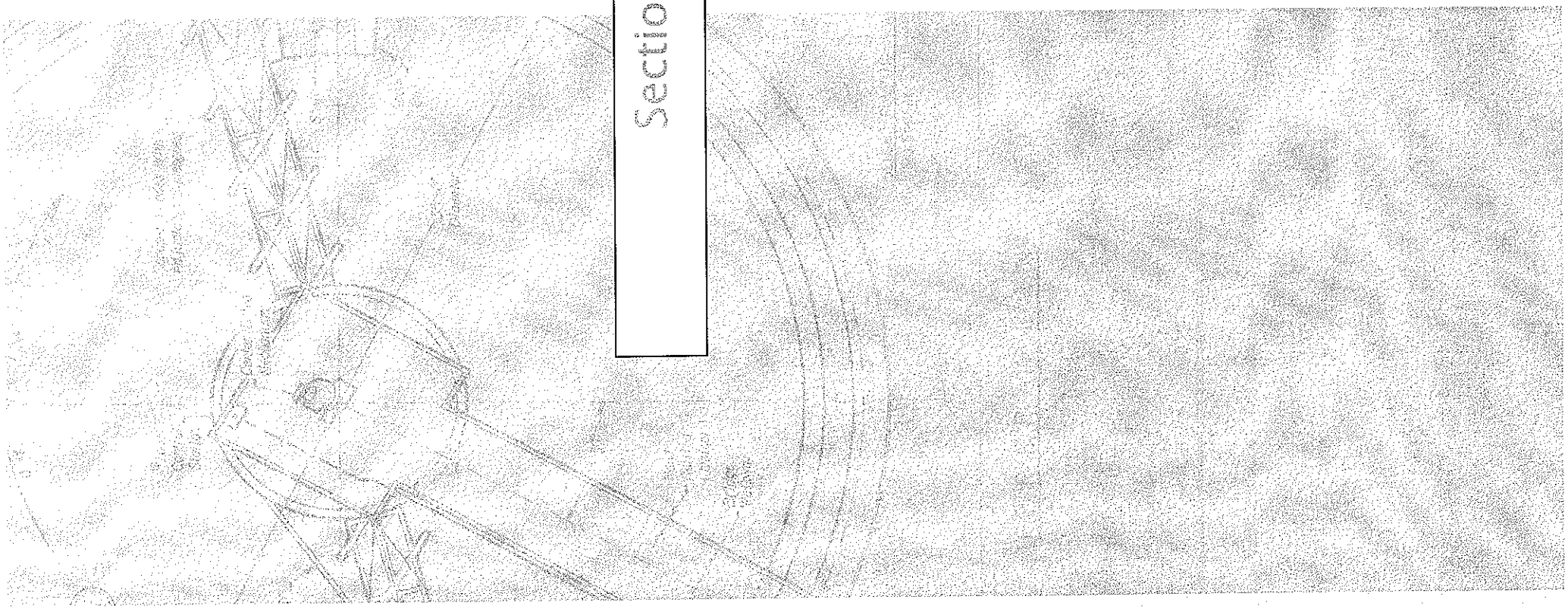
SHEET TITLE

FIGURE V-6

DRAWING NO.

SHEET OF

Section 6



VI.A. CONSISTENCY EVALUATION

Each alternative considered in this Plan for implementing nutrient removal at the Chambersburg Wastewater Treatment Plant (WWTP) was evaluated for consistency with other planning activities and with federal, state, and local regulatory programs.

VI.A.1. CLEAN STREAMS LAW

In accordance with the Clean Streams Law, Comprehensive Water Quality Management Plans (COWAMPs) were developed in the 1970's for all areas of Pennsylvania. Renovation of the existing Chambersburg WWTP, which was originally constructed in the 1910's, would be consistent with the out-of-print COWAMP.

VI.A.2. MUNICIPAL WASTELOAD MANAGEMENT PLANS AND REPORTS

The Borough of Chambersburg is currently entered into a Consent Order and Agreement with PADEP initiated on October 30, 2007. This COA was initiated after multiple raw sewage bypasses from the collection system occurred due to operational issues, equipment failures and emergency conditions related to flooding.

The immediate resolution to eliminate the raw sewage bypasses involved the repairing of various pieces of equipment, which were operating below their design capacity. Since the repairs were completed, bypasses have not occurred and the Borough has been able to operating the plant at its full capacity.

Conditions of the COA require the Borough to conduct a flow metering study within the Borough's collection system. This flow metering information will be used to generate an interim and final report to identify the following items:

a. Sources of inflow and major sources of infiltration (I&I).
b. Analyze flows for each metering point.
c. Compare metered flows to other metered flows (Township connections to the Borough's collection system).
d. Verify hydraulic design capacity of all associated sewage facilities.

Before submittal of the final flow metering report, the Borough will repair specific sources of inflow and infiltration that are quick, easy and relatively inexpensive to repair. A schedule will also be included detailing the rehabilitation and replacement work required to eliminate excessive sources of I&I.

In addition, the Borough will develop and maintain a Connection Accounting System that is divided by Municipal entity, sub-basin and interceptor that the sewage flows into. Also contained within this spreadsheet, will be approved and connected EDUs, with dates of connections.

The Consent Order and Agreement are to remain in effect until December 2009 or for 24 months after the latest bypass not related to a government issued declaration of emergency (although a revised 5 year consent order is being considered related primarily to flow metering and I&I reduction in all areas contributing to the WWTP).

The WWTP is not currently subject to any Corrective Action Plans developed under Title 25, Chapter 94 of the PA Code.

As indicated in Section III, the Chambersburg WWTP is permitted for a discharge of 6.8 million gallons per day (MGD). The NPDES permit for the plant states that this capacity is to be utilized in the preparation of the annual Municipal Wasteload Management (Chapter 94) Report to determine whether the WWTP is hydraulically overloaded. Title 25, Chapter 94 of the *Pennsylvania Code* defines hydraulic overload as, "The condition that occurs when the monthly average flow entering a plant exceeds the hydraulic design capacity for 3-consecutive months out of the preceding 12 months... " According to the Chambersburg' 2009 Chapter 94 Report, the 5-year average of the maximum three-month average flow (3MMF) for the years 2005 through 2009 was 6.403 MGD.

As indicated in Section V, the Pennsylvania Department of Environmental Protection (PADEP) adopted annual effluent caps of Total Nitrogen (TN) and Total Phosphorous (TP) for WWTPs in the Chesapeake Bay Watershed. These caps are to be based on the design influent flow of the plant.

As described in Section IV, projections of future wastewater flows to the Chambersburg WWTP indicate that the 3MMF may reach 10.83 MGD within the 20-year planning period. Based on the adopted strategy of achieving a cap load based on 6.0 mg/L TN and 0.8 mg/L TP at the plant's current design flow of 6.8 MGD, upgrades would be implemented as presented in Section V.

VI.A.3. CLEAN WATER ACT

Copies of the 1970's era "201" Plans that were developed under the Clean Water Act are no longer readily available. However, renovation of the Chambersburg WWTP, which was operational when these "201" Plans were developed, would be consistent with the provisions of that document.

VI.A.4. COMPREHENSIVE PLANS

Chambersburg Borough's Comprehensive Plan was discussed in Section IV. Renovating the Chambersburg WWTP to meet the anticipated TN and TP caps would be consistent with the following community planning goal included in the Comprehensive Plan:

> *"Maximize the efficient use of the Borough's public sewer facilities and identify additional capacity needs based upon future growth projections for residential, commercial, industrial, and institutional uses."*

VI.A.5. ANTI-DEGRADATION REQUIREMENTS

The discharge of treated effluent from the Chambersburg WWTP is regulated and monitored under an NPDES permit that was developed by the Pennsylvania Department of Environmental Protection (PADEP) to meet the requirements of Title 25, Chapters 93 and 95 of the Pennsylvania Code.

The PADEP will add the finalized TN and TP caps to the NPDES Permit. Therefore, renovation of the Chambersburg WWTP to meet the anticipated caps will be consistent with Chapters 93 and 95.

Prior to the start of construction, a Part II Water Quality Management (WQM) Permit would be obtained from the PADEP, in compliance with the anti-degradation requirements of the applicable Chapters of Title 25. Additionally, all necessary Erosion and Sedimentation Control (E&SC)-related permits would be secured to ensure compliance with Title 25, Chapter 102.

VI.A.6. STATE WATER PLANS

The State Water Plan developed in the 1970's has not been updated, and is no longer readily available for review. However, renovation of the existing Chambersburg WWTP, which was operational when the State Water Plan was first prepared, would be consistent with the provisions of that document.

VI.A.7. PRIME AGRICULTURAL LANDS POLICY

Construction activities for the renovation of the Chambersburg WWTP would be limited to the existing plant site. There are no Prime Agricultural Soils located on the site. Therefore, the Plan is consistent with Pennsylvania's Prime Agricultural Lands Policy.

VI.A.8. STORM WATER MANAGEMENT PLANS

Chambersburg Borough regulates storm water management through its Subdivision and Land Development Ordinance. Construction of the proposed WWTP facilities will require compliance with the Borough's storm water regulations.

VI.A.9. WETLAND PROTECTION

Again, construction activities for the renovation project would be limited to the existing plant site. As indicated in Section II, there are no delineated wetland areas on the WWTP site shown on National Wetland Inventory (NWI) mapping. Additionally, there are no hydric soils shown on United States Department of Agriculture Natural Resource Conservation Service (NRCS) mapping. Therefore, a field investigation of the WWTP site is not proposed.

It is anticipated that the existing WWTP outfall at the Conococheague Creek will continue to be utilized without modification. Therefore, it will not be necessary to apply for a General Permit (GP) 04 for Intake and Outfall Structures.

VI.A.10. PROTECTION OF PLANT AND ANIMAL SPECIES

A Pennsylvania Natural Diversity Inventory (PNDI) Search for the WWTP site was requested and conducted as part of this Plan (see correspondence in Appendix 1). The PNDI Environmental Review (ER) Receipt indicates one potential impact to protected plant or animal species. After review, The Pennsylvania Department of Conservation and Natural Resources found no potential impact to protected plant or animal species (see correspondence in Appendix 1).

VI.A.11. PROTECTION OF HISTORICAL AND ARCHEOLOGICAL RESOURCES

A preliminary historical and archaeological screening was requested and received from the Pennsylvania Historic and Museum Commission (PHMC) for the WWTP site (see correspondence in Appendix 1).

From the PHMC's response letter, dated June 21, 2007:

- "There is a high probability that prehistoric and historic archaeological resources are located in this project area."
- "In our opinion, the activity described in your proposal should have no effect on such resources."
- "In our opinion no evaluation of historic structures will be necessary for this project area."

As with all projects, the actual discovery of any archaeological resources during construction would temporarily halt work until an appropriate investigation could be completed.

VI.B. RESOLUTION OF INCONSISTENCIES

No potential inconsistencies were identified in Section VI.A.

VI.C. EVALUATION OF ALTERNATIVES WITH RESPECT TO WATER QUALITY STANDARDS

Refer to Section VI.A.5. for a discussion of water quality standards and effluent limitations.

As part of the Chesapeake Bay Tributaries Strategy, the PADEP intends to implement a nutrient credit-trading program. Under this program, the owners of WWTPs would have the ability to purchase credits for TN and TP from other point and non-point sources. These credits would allow such WWTPs to discharge TN and TP at levels above their cap, thereby acting to supplement or replace construction of facilities to remove the nutrients from their own discharge.

The Borough will continue to monitor the development of this program.

VI.D. COST ANALYSIS FOR ALTERNATIVES

Estimates of construction costs and associated project costs (engineering, legal services, etc.) were prepared for the proposed WWTP upgrade. The cost estimates are included in Appendix 2 and summarized in the following sections.

VI.D.1. COST ESTIMATES FOR WWTP UPGRADE

The estimates are provided for the three alternatives that involve the existing vertical loop reactor system as outlined in Sections V.A.3.b., V.A.3.c. and V.A.3.d.

VI.D.1.a UPGRADE OF THE EXISTING VLR SYSTEM

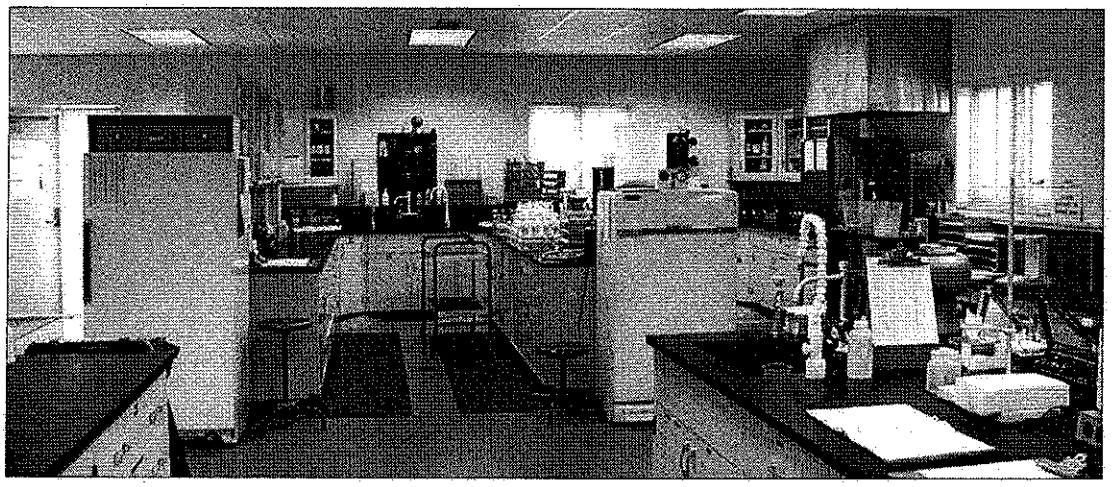
As described in Section V.A.3.b, the plant upgrade to meet the nutrient cap loads at the current influent design flow of 6.8 MGD would include the following:

- construct an anaerobic tank upstream of the existing VLR,
- construct an anoxic tank followed by a re-aeration tank downstream of the existing VLR,
- modifications to existing electrical and SCADA systems,
- installation of metal salt feed system for phosphorous removal, and
- installation of soluble carbon source feed for denitrification.

The estimated construction cost for this WWTP upgrade is $8,165,000. This estimate includes a 25% contingency.

Related project costs, including engineering, legal and financial services, etc. are estimated at $1,633,000.

Therefore, the total project cost to implement the nutrient removal upgrade is estimated at $9,798,000.



VI.D.1.b EXPANSION OF THE EXISTING VLR SYSTEM

As described in Section V.A.3.c, the plant expansion to increase the plant capacity to handle a project daily flow of 10.83 MGD would consist of the following:

- construct a second VLR train identical to the existing train,
- construct an additional two final clarifiers,
- construct a primary clarifier splitter box and RAS splitter box,
- construct a new RAS/blower building for proposed VLR No. 2,
- retrofit of final clarifier splitter box, and
- upgrade the plant electrical service
- upgrade the plant SCADA system,
- expansion of the UV disinfection system, and
- replacement of emergency generator.

The estimated construction cost for this WWTP upgrade is $17,176,000. This estimate includes a 25% contingency.

Related project costs, including engineering, legal and financial services, etc. are estimated at $3,435,200.

Therefore, the total project cost to implement the nutrient removal upgrade is estimated at $20,611,200.

VI.D.1.c EXPANSION AND UPGRADE OF THE EXISTING VLR SYSTEM

As described in Section V.A.3.d, the plant expansion and upgrade will consist of the following:

- construct an anaerobic tank upstream of the existing VLR,
- construct an anoxic tank followed by a re-aeration tank downstream of the existing VLR,
- construct a second VLR train identical to the existing train,
- construct an anaerobic tank upstream of the new VLR system,
- construct an anoxic tank followed by a re-aeration tank downstream of the new VLR system,
- construct an additional two final clarifiers,
- construct a primary clarifier splitter box and RAS splitter box,
- construct a new RAS/blower building for proposed VLR No. 2,
- retrofit of final clarifier splitter box,
- upgrade the plant electrical service,
- upgrade the plant SCADA system,
- installation of metal salt feed system for phosphorous removal,
- installation of soluble carbon source feed for denitrification,
- expand UV disinfection system,
- replacement of emergency generator.

The estimated construction cost for this WWTP upgrade is $21,046,300. This estimate includes a 25% contingency.

Related project costs, including engineering, legal and financial services, etc. are estimated at $4,209,300.

Therefore, the total project cost to implement the nutrient removal upgrade and expansion is estimated at $25,255,600.

VI.D.2. COST ESTIMATES FOR NEW SOLIDS DEWATERING FACILITIES

As noted in Section V, the Borough is upgrading its solids dewatering facilities at the WWTP. Of the two ATAD alternatives analyzed, the first alternative was chosen for the following reasons:

- Continued operation of existing anaerobic digesters during installation of the ATAD system.
- Continued generation of methane for anaerobic digester and surrounding building heating.
- Optimization of mechanical components recently installed for the anaerobic digesters.

VI.D.2.a ATAD SYSTEM WITH ANAEROBIC DIGESTION

With the selected alternative, the WWTP would utilize Thermal Process Systems' ThermAer™ with anaerobic digestion. The process would require the following:

- Installation of three ThermAer™ reactors,
- Conversion of the dual WAS tanks to be the new Simultaneous Nitrification Denitrification Reactors (SNDR),
- Construction of a Biofilter for the ATAD system,
- Modifications to existing primary clarifier gravity thickener,
- Modifications to existing Primary and Secondary Anaerobic Digesters,
- Conversion of existing digested sludge holding tank to new Thickened Waste Activated Sludge (WAS) tank,
- Replacement of existing rotary drum thickeners with gravity belt thickeners,
- Replacement of existing belt filter presses,
- Installation of ancillary components for complete installation.

The estimated construction cost for this WWTP upgrade is $11,574,300. This estimate includes a 25% contingency.

Related project costs, including engineering, legal and financial services, etc. are estimated at $2,314,900.

Therefore, the total project cost to implement the solids treatment upgrade is estimated at $13,889,200.

VI.D.2.b ATAD SYSTEM WITHOUT ANAEROBIC DIGESTION

With this alternative, the WWTP would utilize Thermal Process Systems' ThermAer™ without anaerobic digestion. The process would require the following:

- installation of three ThermAer™ reactors,
- conversion of primary and secondary anaerobic digester tanks to two SNDR (simultaneous nitrification, denitrification reaction) tanks,
- temporary disposal of primary clarifier sludge that would have normally gone to the anaerobic digesters,
- installation of BiofiltAer™ odor control system,
- installation of two gravity belt thickeners,
- installation of temporary dewatering equipment,
- replacement of existing belt filter presses, and
- installation of polymer feed systems.

The estimated construction cost for this WWTP upgrade is $13,799,400. This estimate includes a 25% contingency.

Related project costs, including engineering, legal and financial services, etc. are estimated at $2,759,900.

Therefore, the total project cost to implement the solids treatment upgrade is estimated at $16,559,300.

VI.D.3. FINANCIAL ANALYSIS OF DEWATERING ALTERNATIVES

As shown in the previous section, utilizing Thermal Process Systems' ThermAer™ with anaerobic digestion has the lower capital cost of the two dewatering alternative; thus, this alternative is the preferred solids handling upgrade at the plant.

The cost of the two ATAD systems is within 6% of each other when a present worth cost analysis of the two alternatives was performed. This analysis looked at the capital costs for the ATAD system and sludge dewatering equipment, associated costs associated with operating the ATAD, the cost to operate the anaerobic digesters (for the first alternative) and the cost of dewatering the ATAD generated sludge.

Accounting for these differences, the relative present worth of each alternative was calculated as follows:

- ATAD Alternative 1 - Thermal Process Systems' ThermAer™ with anaerobic digestion: $20,581,000
- ATAD Alternative 2 - Thermal Process Systems' ThermAer™ without anaerobic digestion: $22,273,000

The predicted relative present-worth values of the first two alternatives are within 7.6% of each other.

As described in Section V, ATAD Alternative 1 has been selected for the solids dewatering process.

VI.E. ANALYSIS OF FUNDING METHODS FOR ALTERNATIVES

VI.E.1. POTENTIAL FUNDING SOURCES

With the termination of the federal Construction Grants Program in the 1990's, general grant funding of wastewater construction projects ended. A reduced level of federal funding, the Clean Water State Revolving Fund (CWSRF), continues to capitalize state revolving loan funds, including the PENNVEST Program in Pennsylvania.

PENNVEST primarily benefits low-income communities with low interest loans and grants. Limited funding forces PENNVEST to assess a higher rate of interest on larger, more affluent municipalities. These often find that administrative and other add-on costs of participation in this program outweigh the benefits.

The CWSRF annual budget is currently $900 million. An October 28, 2005 White House proposal to rescind $166 million from the CWSRF would further hinder this already limited funding source.

Small grants have continued to be provided through various special grants programs focusing on regional or national problems or innovative/alternative technologies.

Current active special programs include:

Water Quality Cooperative Agreement Allocation (CFDA 66.463) - This program is administered through the Environmental Protection Agency (USEPA). Grants have been limited to $10,000 to $500,000, typically to research and pilot test processes related to current goals such a nutrient removal and energy efficiency.

Community Facilities Loan and Grant Program – This program is administered through the Rural Utilities Service (USRUS). Grants are limited to $250,000 for qualified sewer and water projects for rural and small communities. The availability of these grants is "very limited".

Chesapeake Bay Program Grants - This program is administered through USEPA. Grants have averaged $300,000 for projects to reduce and prevent pollution to the Chesapeake Bay. Funding through this program has been severely reduced in recent years.

Sizable grant funding for specific sewer projects (usually projects that match current federal priorities such as nutrient management or elimination of sewer overflows) has largely been provided individually or to sets of grantees through USEPA appropriations bills. These grants are administered through the Army Corps of Engineers (USACE).

To date, Pennsylvania has indicated that significant state funding may be provided for the construction projects required to upgrade WWTPs to meet the proposed nutrient limits imposed under the Chesapeake Bay initiative and the Borough has applied applying for an H2O grant.

VI.E.2. DEBT SERVICE AND USER RATE CALCULATIONS

For the purposes of this analysis, it is presumed that the capital cost required to implement the nutrient removal upgrade and expansion project will be completely financed through a public bond issue. Assuming that a 20-year bond would be obtained at a rate of 5.00%, the annual debt service has been shown for the following upgrade alternatives:

VI.E.2.a BIOLOGICAL PROCESSES

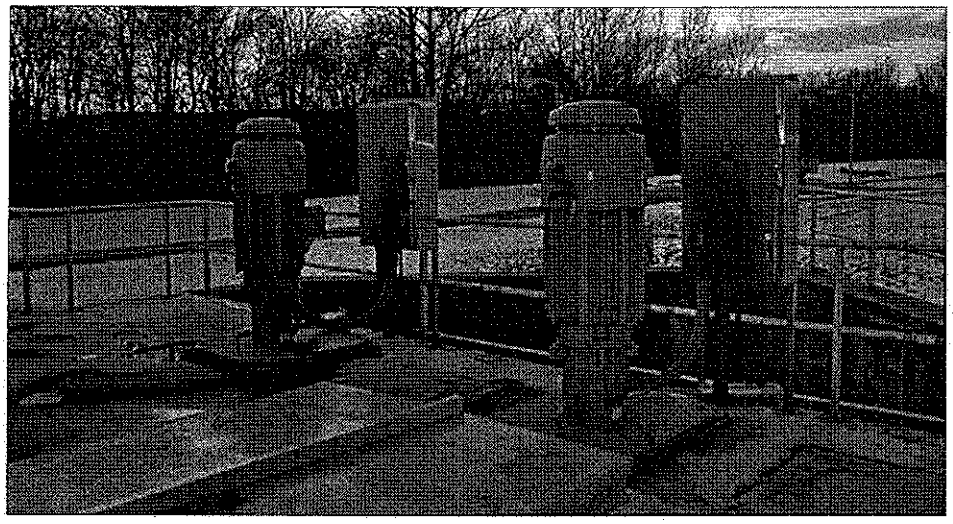
i. Upgrade of the existing VLR System

The upgrade of the existing vertical loop reactor would be based upon the current inter-municipal agreements. Based on these documents, the Borough of Chambersburg's portion of the cost for the increase would be directly tied to its allocated percentage of the plant design flow. As Chambersburg's allocation is 2.73 MGD, and the design flow is 6.8 MGD, the Borough would be responsible for approximately 40.1% of the cost for this upgrade to meet the annual TP and TN cap loads.

The estimated total project cost for the upgrade of the existing vertical loop reactor system is $9,789,900 of which the Borough would be financially responsible for $3,931,000. The annual debt service for this principal value would be $315,500.

There are approximately 13,955 equivalent dwelling units (EDU) connected to the Chambersburg wastewater system. As documented in Section IV, the rate of growth within Chambersburg has been estimated at an approximate rate of 1% per year over the next 20 years. Therefore, the annual debt service will need to be covered largely by the existing customer base. As such, the initial new annual debt service per customer will be approximately $23 per year. Currently, the average customer connected to the

Chambersburg wastewater system pays approximately $195 per EDU per year for service. Therefore, without substantial Federal or State funding assistance, the inclusion of the debt service for the plant upgrade would require a 12% increase in the average user rate, to $218per EDU per year.



ii. Expansion of the Existing VLR System

The expansion of the existing vertical loop reactor would be based upon the new inter-municipal agreements. Based on these new agreements, the Borough of Chambersburg's portion of the cost for the increase would be directly tied to its allocated percentage of the increase in plant design flow. Chambersburg's increase above its current allotment of 2.73 MGD would be 0.78 MGD, and the plant would be increased to a new design flow of 10.83 MGD (4.03 MGD higher). Therefore, Borough would be responsible for approximately 19.3% (0.78 divided by 4.03) of the cost for this expansion in flow.

The estimated total project cost for the expansion of the existing vertical loop reactor system is $20,611,200, of which the Borough would be financially responsible for $3,978,000. The annual debt service for this principal value would be $319,000.

There are approximately 13,955 equivalent dwelling units (EDU) connected to the Chambersburg wastewater system. As documented in Section IV, the rate of growth within Chambersburg has been estimated at an approximate rate of 2% per year over the next 20 years. Therefore, the annual debt service will need to be covered largely by the existing customer base. As such, the initial new annual debt service per customer will be approximately $23 per year. This amount would be added to the cost per EDU after the Upgrade to the existing VLR system. Therefore, the average customer connected to the Chambersburg wastewater system would be paying approximately $218 per EDU per year for service. Without substantial Federal or State funding assistance, the inclusion of the debt service for the plant upgrade would require a 10% increase in the average user rate, to $241 per EDU per year (note that this is in addition to the increase needed to upgrade for nutrient removal).

iii. Expansion and Upgrade of the Existing VLR System

The total cost to both upgrade and expand the plant from the first two options is $30,401,100. The total Borough share of these two options is $7,909,000. This represents 26% of the total cost. This same ratio should be applied to the third option, which is to simultaneously upgrade and expand the WWTP.

The estimated total project cost for the expansion and upgrade of the existing vertical loop reactor system is $25,255,600, of which the Borough would be financially responsible for $6,566,300. The annual debt service for this principal value would be $526,900.

There are approximately 13,955 equivalent dwelling units (EDU) connected to the Chambersburg wastewater system. As documented in Section IV, the rate of growth within Chambersburg has been estimated at an approximate rate of 1% per year over the next 20 years. Therefore, the annual debt service will need to be covered largely by the existing customer base. As such, the initial new annual debt service per customer will be approximately $38 per year. Currently, the average customer connected to the Chambersburg wastewater system pays approximately $195 per EDU per year for service. Therefore, without substantial Federal or State funding assistance, the inclusion of the debt service for the plant upgrade would require a 19% increase in the average user rate, to $233 per EDU per year.

VI.E.2.b DEWATERING PROCESSES

I. ATAD with Anaerobic Digestion

The installation of the ATAD (autothermal thermophillic aerobic digestion) with anaerobic digestion system would be in conjunction with either of the plant flow expansion alternatives discussed above. Based on the cost sharing described above for the combined upgrade / expansion project, the Borough of Chambersburg's portion of the cost would be 26%.

The estimated total project cost for the installation of the ATAD system is $13,889,200, of which the Borough would be financially responsible for $3,611,200. The annual debt service for this principal value would be $289,800.

There are approximately 13,955 equivalent dwelling units (EDU) connected to the Chambersburg wastewater system. As documented in Section IV, the rate of growth within Chambersburg has been estimated at an approximate rate of 1% per year over the next 20 years. Therefore, the annual debt service will need to be covered largely by the existing customer base. As such, the initial new annual debt service per customer will be approximately $21.00 per year for the solids dewatering improvements. This would represent an approximate increase of 9% over the new user rates ($233) per EDU listed above. Therefore, without substantial Federal or State funding assistance, the inclusion of the debt service for the plant upgrade would increase the average user rate to approximately $254 per EDU per year.

The various debt service scenarios are summarized in Table VI-1.

TABLE VI-1
DEBT SERVICE SUMMARY

Alternative	Estimated Project Cost	Borough of Chambersburg's Portion of Alternative	Additional Annual Debt Service [a]	Initial Additional Annual Debt Service per Borough Customer[b]
Upgrade of Existing VLR System to meet Annual TN & TP cap loads	$9,789,000	$3,931,000 (40.1%)	$315,500	$22.60
Expansion of Existing VLR System to meet projected flow increase.	$20,611,200	$3,978,000 (19.3%)	$319,000	$22.90
Expansion and Upgrade of Existing VLR System to meet projected flow increase and annual TN & TP cap loads	$25,255,600	$6,566,300 (26%)	$526,900	$38.00
Construct Autothermal Thermophillic Aerobic Digestion (ATAD) with anaerobic digestion.	$13,889,200	$3,611,200 (26%)	$289,800	$21.00

[a] based on a 30-year bond issue of all capital costs at 5% interest
[b] based on 13,955 existing EDUs

VI.F. IMPLEMENTATION OF ALTERNATIVES

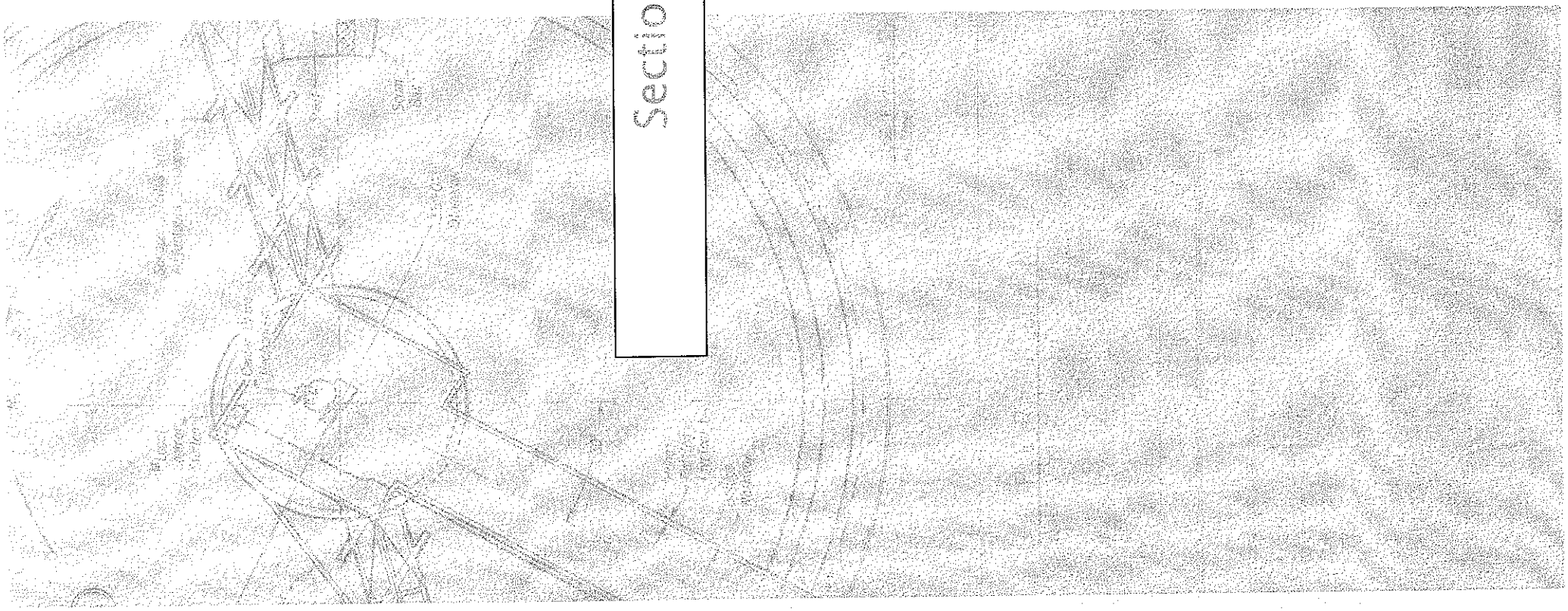
The current NPDES permit issued by the PADEP for this WWTP contains a compliance schedule that details that the BNR improvements need to be substantially completed by August 1, 2011 and in full compliance with effluent limitations by September 30, 2013. Presuming an 18 to 24 month construction contract period, construction of the facility upgrades must begin by early 2010 to ensure compliance with the permit deadline.

VI.G. EVALUATION OF ORGANIZATIONS AND LEGAL AUTHORITY NECESSARY FOR PLAN IMPLEMENTATION

Once completed and approved, the Chambersburg Borough Council must enact a resolution to adopt this Act 537 Sewage Facilities Plan.

The Borough owns and finances all municipal wastewater facilities within Chambersburg. Since its inception, the Borough itself has been responsible for the planning, design, permitting, and construction of all renovations to the municipal wastewater facilities within the Borough.

Section 7



VII.A. ANALYSIS OF WASTEWATER TREATMENT AUTHORITIES

VII.A.1. FINANCIAL AND DEBT STATUS

According to their annual audit, as of December 31, 2006, the Borough had total current assets at approximately $39,051,000. The net value of property, plant, and equipment, less depreciation, was $109,000,597 for a total asset value of approximately $148,052,000. Current liabilities as of the same date were reported to be approximately $7,330,364, with long-term liabilities of $24,135,962. Therefore, total liabilities were $31,466,326. Based upon these figures, the Borough's assets exceeded its liabilities by approximately $116,585,717 at the end of 2006.

Chambersburg Sewer Department had total revenues of approximately $3,770,173 in 2007. The vast majority of this revenue came from sewer service charges consisting of user and tapping fees. Total expenses for the treatment plant and collection system for 2007 were reported as $3,778,307, which included a $200,000 transfer to the Sewer Capital Reserve fund.

The Sewer Capital Reserve fund had total revenues of approximately $2,260,426 in 2007. Total expenditures for 2007 from this fund totaled $647,267, leaving an available balance year end of $1,613,159.

VII.A.2. STAFF AND ADMINISTRATIVE RESOURCES

Currently, the Chambersburg Borough wastewater staff consists of a Manager, an Assistant Manager, and an operations staff of five. Additional Borough staff members involved in wastewater activities include the Borough Manager, Financial Manager, and billing staff.

VII.A.3. LEGAL AUTHORITY

Since the plant's first construction in the early 1910's, the Borough has been responsible for ownership, operation, and maintenance of all public wastewater facilities within Chambersburg Borough. The wastewater operation, maintenance, and administrative staff are employees of the Borough.

The Borough also oversees the planning, design, permitting, and construction of renovations to the public sewer system within Chambersburg. Smaller maintenance and repair projects are completed with in-house staff and equipment. Private contractors, through contracts administered by the Borough, generally perform larger construction projects. The Borough also reviews the design and construction of any connections to, and/or extensions of, the public sewer system that are undertaken by Developers to serve new land development projects.

The Borough is responsible for setting and collecting both the annual user rentals billed to customers and the tapping fees charged for new connections to the municipal wastewater system.

The Borough also oversees enforcement actions taken against violators of the Borough's ordinances pertaining to the municipal wastewater system. The Borough is generally responsible for enforcing ordinances pertaining to the few on-lot sewage disposal systems (OLDS) that exist within Chambersburg.

The Borough is responsible for enforcement of the Chambersburg Borough industrial wastewater pretreatment standards, listed in Article 173-39.

The Borough entered into an inter-municipal agreement with Greene, Hamilton, and Guilford Townships for the conveyance and treatment of wastewater generated in the Townships. Revision of these existing agreements would be required to implement the upgrade to the existing VLR (vertical loop reactor) system required to meet the annual cap loads for total nitrogen and total phosphorous as described in this Plan.

These inter-municipal agreements will need to be revised to allow for expansion of the Borough's wastewater treatment plant to meet the projected flow increases.

The Borough is also responsible for funding construction, operation, and maintenance activities related to the municipal wastewater system.

VII.B. ANALYSIS OF INSTITUTIONAL ALTERNATIVES

No new municipal departments or authorities would be required to implement the activities described in this Plan. However, a new inter-municipal agreement must be in place in order to proceed with a WWTP expansion.

As with past projects, Chambersburg would be responsible for the design, permitting, and construction of all proposed facilities

VII.C. ADMINISTRATIVE AND LEGAL ACTIVITIES REQUIRED FOR PLAN IMPLEMENTATION

No new ordinances, regulations, or standards would need to be developed to implement the activities described in this Plan.

Revision of the current inter-municipal agreements would be required to implement the Upgrade to the Existing VLR (vertical loop reactor) System required to meet the annual cap loads for total nitrogen and total phosphorous as described in this Plan. Expansion of the Borough's wastewater treatment plant requires revision of the existing inter-municipal agreements.

VII.D. IDENTIFICATION OF PROPOSED INSTITUTIONAL ALTERNATIVE

As described in Section VI, the Chambersburg Borough Council must enact a resolution to adopt this Act 537 Sewage Facilities Plan.

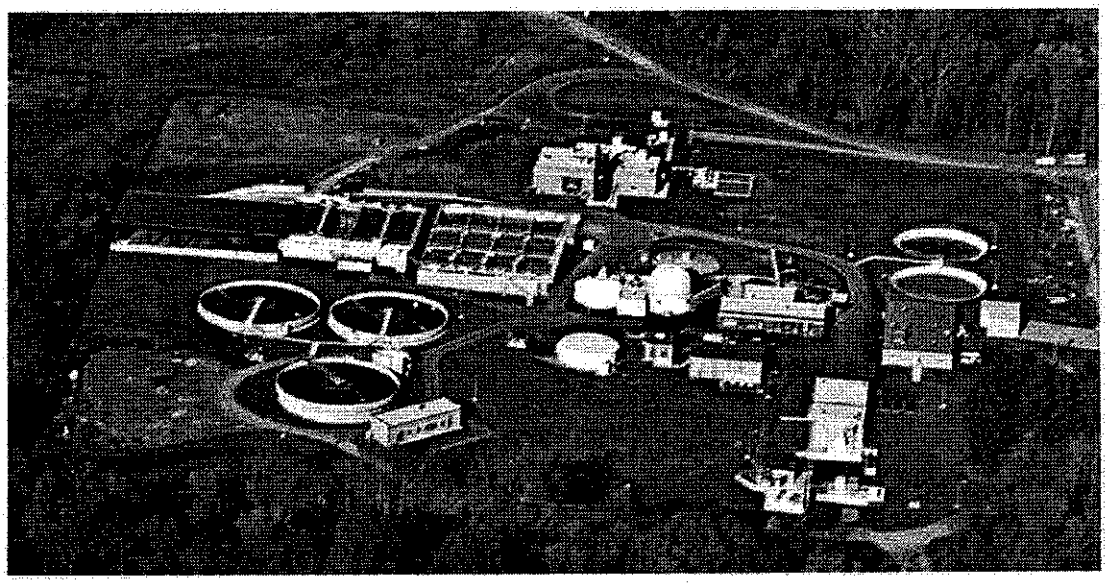
Once that has been completed, the Borough will be responsible for implementing the activities described in the Plan in accordance with the schedule presented in Sections VI and VIII.

Section 8

VIII. Implementation Schedule and Justification for Selected Technical and Institutional Alernatives

VIII.A. SELECTED TECHNICAL WASTEWATER DISPOSAL ALTERNATIVE

As indicated in previous sections, the existing Chambersburg Wastewater Treatment Plant (WWTP) will be subject to new Total Phosphorous (TP) and Total Nitrogen (TN) limits in regards to the Commonwealth of Pennsylvania's Chesapeake Bay Tributary Strategy. In its current configuration, the existing WWTP will not be able to meet the anticipated TP and TN limits. In addition, significant projected population increases in surrounding townships requires a plant expansion from 6.8 MGD to 10.83 MGD.



VIII.A.1 BIOLOGICAL PROCESSES

The Borough of Chambersburg has determined that the WWTP will be upgraded to meet the new limits (annual cap loads for TN and TP) contained in the revised NPDES permit by implementing the following changes to the biological process. These changes have been outlined in the biological process alternative labeled as Upgrade and Expansion of the Existing VLR System, as shown below:

- Construction of a second Vertical Loop Reactor (VLR) train identical to the existing VLR train.
- Construction of one (1) anaerobic selector tank to be located upstream of each VLR train, for a total of two (2) anaerobic selector tanks.
- Construction of one (1) secondary anoxic tank followed by one (1) re-aeration tank that will receive the effluent from each VLR, for a total of two (2) secondary anoxic tanks and two (2) re-aeration tanks.
- Construction of two (2) additional final clarifiers.
- Construction of a primary clarifier effluent splitter box to divide the flow to both VLRs.
- Construction of a Return Activated Sludge (RAS) splitter box to divide the RAS flow to both VLRs.
- Construction of a new RAS Pump Station/Blower Building for the proposed VLR.
- Retrofit of the final clarifier splitter box to accommodate two (2) new final clarifiers.
- Expansion of the UV Disinfection System

- Upgrade of the plant electrical service and SCADA system.

This upgrade to the biological process will allow the facility to meet the annual total nitrogen and total phosphorous cap loads at the new design flow rate of 10.83 MGD.

As noted in Section IV, the Borough and contributing Townships have projected an increase in flow to the facility to reach 10.83 MGD by 2026. To facilitate the expansion of the wastewater treatment plant to handle this increase in flow, new inter-municipal agreements have been implemented. The estimated total project cost for the expansion and upgrade of the existing vertical loop reactor system is $25,255,600 of which the Borough would be financially responsible for 26% of this cost, which is $6,566,300. The annual debt service for this principal value would be $526,900. The increase in annual debt service per customer will be approximately $38.00 per year. Currently, the average customer connected to the Chambersburg wastewater system pays approximately $195 per EDU per year for service. Therefore, without substantial Federal or State funding assistance, the inclusion of the debt service for the plant expansion and upgrade would require a 19% increase in the average user rate, to $233 per EDU per year.

VIII.A.2. DEWATERING PROCESSES

As noted in Sections V and VI, the Borough is also upgrading the existing solids handling system at the WWTP, with the following facilities:

- Construction of three (3) new, second generation, Autothermal Thermophilic Aerobic Digesters (ATAD). This system will be the ThermAer Process as manufactured by Thermal Process Systems.
- Conversion of the dual WAS tanks to be the new Simultaneous Nitrification Denitrification Reactors (SNDR).
- Construction of a Biofilter for the ATAD system.
- Modifications to existing primary clarifier gravity thickener.
- Modifications to existing Primary and Secondary Anaerobic Digesters.
- Conversion of existing digested sludge holding tank to new Thickened Waste Activated Sludge (WAS) tank.
- Replacement of existing rotary drum thickeners with gravity belt thickeners.
- Replacement of existing belt filter presses.
- Installation of ancillary components for complete installation.

The total project cost for the upgrade to the solids handling facilities described in the previous section is estimated at $13,889,200. Implementing both the WWTP expansion and upgrade along with the upgrade to the solids handling facilities results in an estimated total project cost of $39,144,800. Since these facilities are going to be constructed in conjunction with the nutrient removal upgrade, the resultant debt service will require a 30% increase in Chambersburg user rates, to $254 per year.

VIII.B. Capital Financing Plan

There is a possibility that Federal or State grant funding may be available for the construction projects required to upgrade WWTPs to meet the proposed nutrient limits imposed by the Chesapeake Bay Initiative. The sizes of potential grants through DCED's H2O PA grant program

are unknown (although maximum is twenty million dollars). Although grants are being vigorously pursued, the financial analysis was done conservatively and did not include grant monies as a source of revenue. Therefore, it is presumed that the mandated plant upgrade will be financed through a 20-year bond issue.

Because of the burden that will be imposed on the Borough's existing wastewater customers by the new debt service, all potential funding sources that may be available to supplement a bond issue will be analyzed as project planning continues.

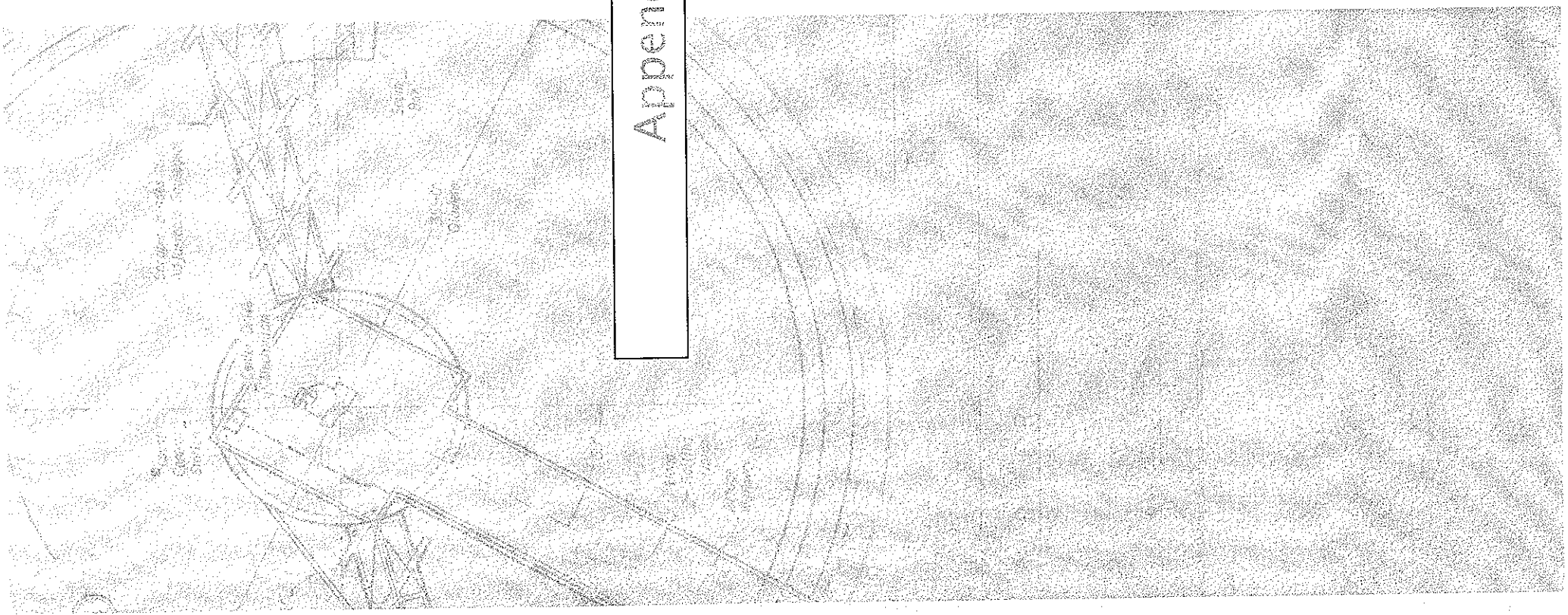
VIII.C. Implementation Schedule

As indicated in Section VI, the PADEP has indicated that all WWTPs must begin meeting the TN and TP caps. The following schedule is proposed for the WWTP upgrade:

TABLE VIII-1
IMPLEMENTATION SCHEDULE FOR THE
CHAMBERSBURG WWTP UPGRADE AND EXPANSION PROJECT

Activity	Date
Start Flow Metering Study	January 2008
Advertise for Public Comment	March 2009
Identify Conveyance Capacity Needs	June 2009
Execute Inter Municipal Agreements	September 13, 2010
Submit Act 537 Plan to PADEP	October 2010
PADEP Approval	January 2011
Begin WWTP Design	January 2011
Submit WQM Part II Permit to PADEP	April 2011
Part II Approval by PADEP	June 2011
Award Construction Contract	August 2011
Substantial Construction of WWTP Project	February 2013
Compliance With Effluent Limitations	March 2013
Complete Flow Metering Study	March 2013

Appendix 1



Commonwealth of Pennsylvania
Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120-0093
www.phmc.state.pa.us

June 21, 2007

Philip M. DePoe, E.I.T.
Buchart Horn, Inc.
445 W. Philadelphia Street
York, PA 17401-3383

TO EXPEDITE REVIEW USE
BHP REFERENCE NUMBER

Re: File No. ER 94-0158-055-C
DEP Water Management Permit: Act 537 Sewage Facilities Plan, Existing Wastewater Treatment Plant Upgrade, Chambersburg Borough, Franklin County

Dear Mr. DePoe:

The Bureau for Historic Preservation has reviewed the above named project under the authority of the Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988). This review includes comments on the project's potential effect on both historic and archaeological resources.

There is a high probability that prehistoric and historic archaeological resources are located in this project area. In our opinion, the activity described in your proposal should have no effect on such resources. Should the scope of the project be amended to include additional ground disturbing activity this office should be contacted immediately and a Phase I Archaeological Survey may be necessary to locate all potentially significant archaeological resources.

In our opinion no evaluation of historic structures will be necessary for this project area.

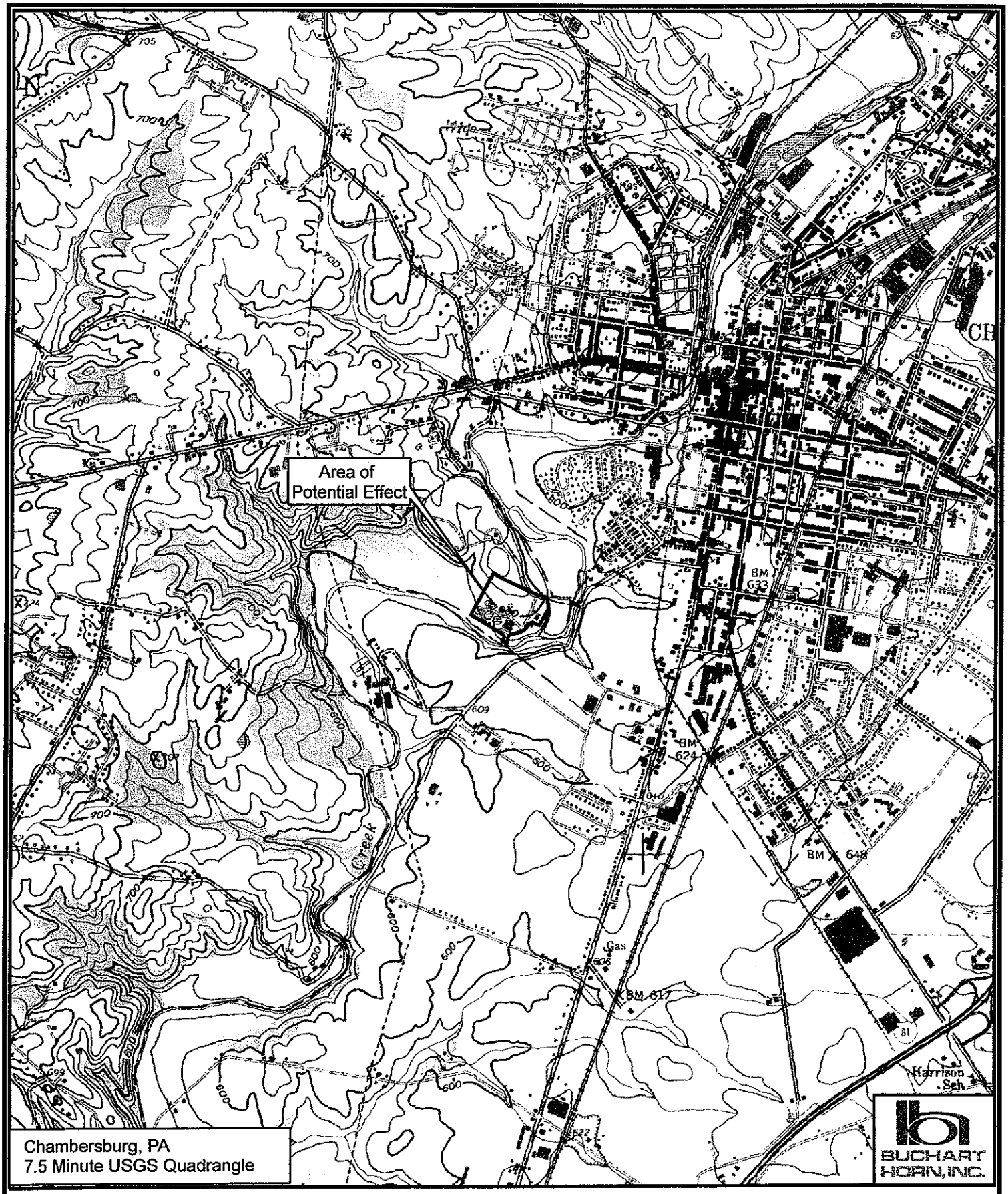
If you need further information in this matter please consult Doug McLearen at (717) 772-0925.

Sincerely,

Douglas C. McLearen, Chief
Division of Archaeology & Protection

Cc: DEP, Southcentral Regional Office

DCM/tmw



Legend

Area of Potential Effect

1,000 500 0 1,000 2,000 Feet

1 inch equals 2,000 feet

Chambersburg WWTP
Act 537 Plan Update
Franklin County, Pennsylvania
BH No. 76374-00

J:\PROJ\76374-00\GIS\Projects\Chambersburg WWTP Location Map.mxd .pdf

Legend

Project Location

250 125 0 250 500 Feet

1 inch equals 500 feet

Chambersburg WWTP
Act 537 Plan Update
Franklin County, Pennsylvania
BH No. 76374-00

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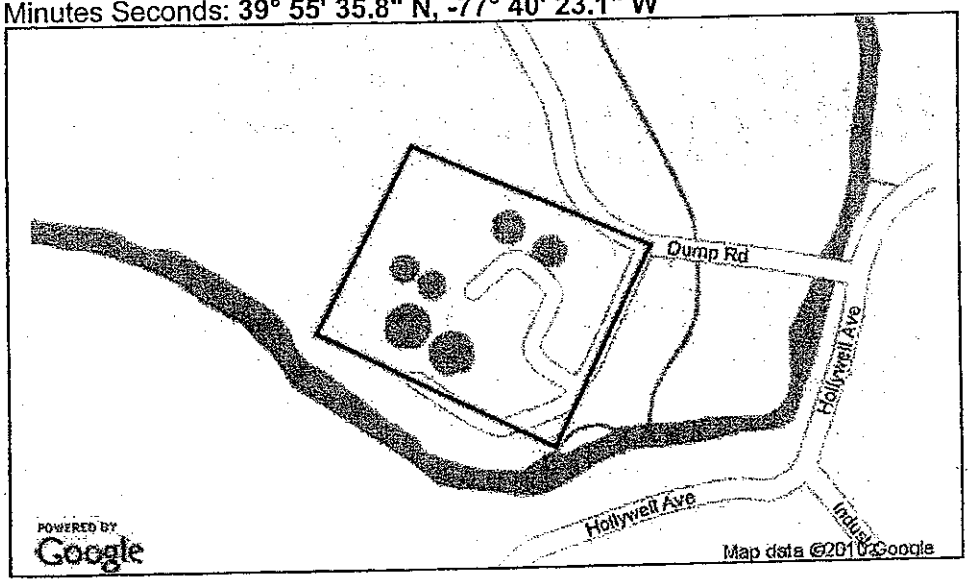
PNDI Project Environmental Review Receipt Project Search ID: 20100412238364

1. PROJECT INFORMATION

Project Name: **Chambersburg Act 537 - 2010 Submission**
Date of review: **4/12/2010 10:04:00 AM**
Project Category: **Waste Transfer, Treatment, and Disposal,Liquid waste/Effluent,Sewage module/Act 537 plan**
Project Area: **14.3** acres
County: **Franklin** Township/Municipality: **Chambersburg**
Quadrangle Name: **CHAMBERSBURG** ~ ZIP Code: **17201**
Decimal Degrees: **39.926621 N, -77.673082 W**
Degrees Minutes Seconds: **39° 55' 35.8" N, -77° 40' 23.1" W**



2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for one year** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt.

PA Game Commission

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

DCNR Species:
Scientific Name: Ruellia strepens
Common Name: Limestone Petunia
Current Status: Threatened
Proposed Status: Threatened

RESPONSE: Further review of this project is necessary to resolve the potential impacts(s). Please send project information to this agency for review (see WHAT TO SEND).

PA Fish and Boat Commission

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service

RESPONSE: No impacts to federally listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

* Special Concern Species or Resource - Plant or animal species classified as rare, tentatively undetermined or candidate as well as other taxa of conservation concern, significant natural communities, special concern populations (plants or animals) and unique geologic features.
** Sensitive Species - Species identified by the jurisdictinal agency as collectible, having economic value, or

being susceptible to decline as a result of visitation.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, send the following information to the agency(s) seeking this information (see AGENCY CONTACT INFORMATION).

Check-list of *Minimum* Materials to be submitted:

✓ **SIGNED** copy of this Project Environmental Review Receipt
____Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
____Project location information (name of USGS Quadrangle, Township/Municipality, and County)
____USGS 7.5-minute Quadrangle with project boundary clearly indicated, and quad name on the map

The inclusion of the following information may expedite the review process.
____A basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams
____The DEP permit(s) required for this project

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. For cases where a "Potential Impact" to threatened and endangered species has been identified before the application has been submitted to DEP, the application should not be submitted until the impact has been resolved. For cases where "Potential Impact" to special concern species and resources has been identified before the application has been submitted, the application should be submitted to DEP along with the PNDI receipt, a completed PNDI form and a USGS 7.5 minute quadrangle map with the project boundaries delineated on the map. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. DEP and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at http://www.naturalheritage.state.pa.us.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a **preliminary** screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552, Harrisburg, PA. 17105-8552
Fax:(717) 772-0271

U.S. Fish and Wildlife Service
Endangered Species Section
315 South Allen Street, Suite 322, State College, PA. 16801-4851
NO Faxes Please.

PA Fish and Boat Commission
Division of Environmental Services
450 Robinson Lane, Bellefonte, PA. 16823-7437
NO Faxes Please

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA. 17110-9797
Fax:(717) 787-6957

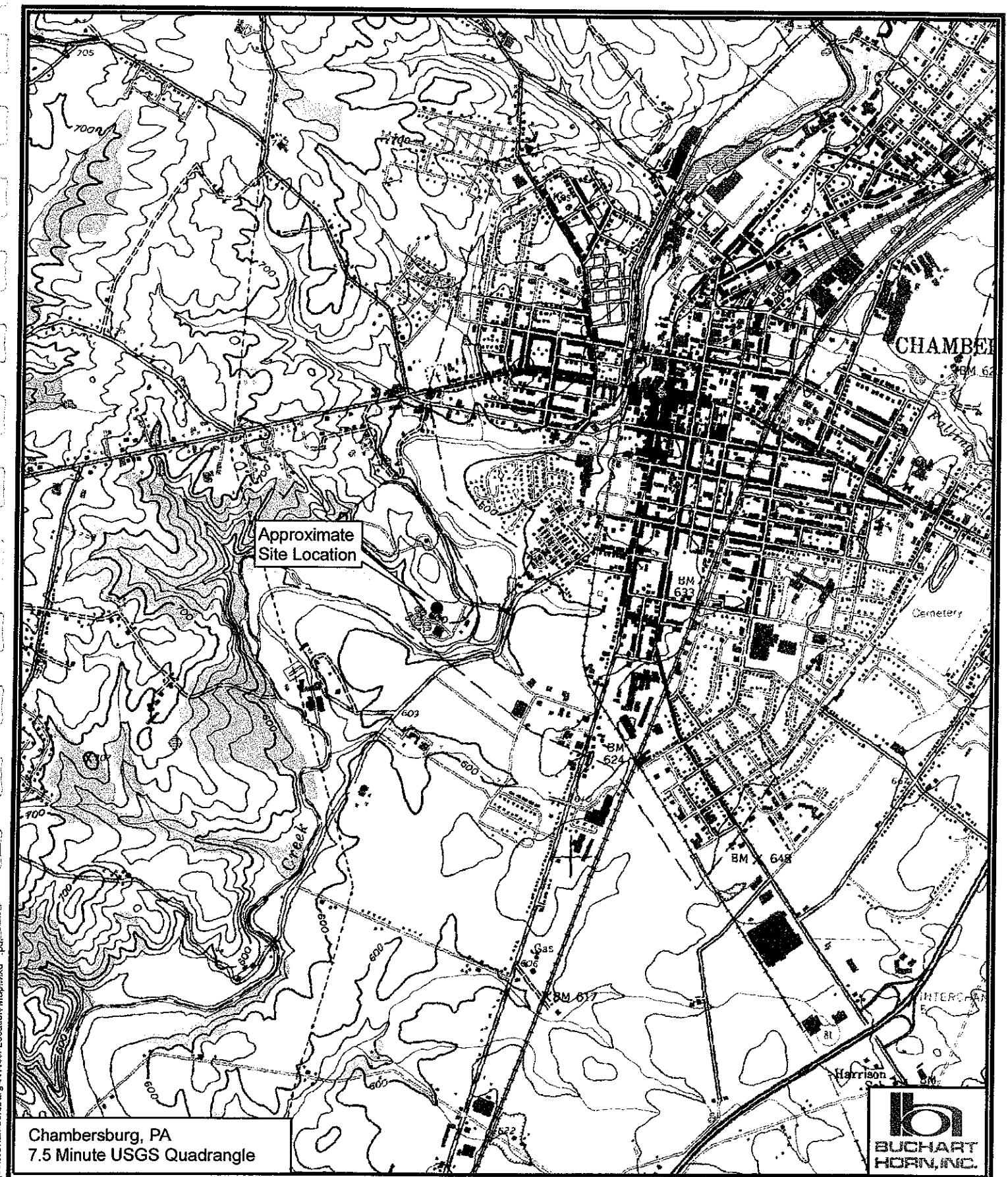
7. PROJECT CONTACT INFORMATION

Name: Philip M. DePoe
Company/Business Name: Buchart Horn, Inc.
Address: 445 W. Philadelphia St.
City, State, Zip: York, PA 17401
Phone:(717) 852-1480 Fax:(717) 852-1615
Email: pdepoe@bh-ba.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

Philip M. DePoe 4/12/10
applicant/project proponent signature date



Legend

- Site Location

N

1,000 500 0 1,000 2,000 Feet

1 inch equals 2,000 feet

Chambersburg WWTP
Act 537 Plan Update
Franklin County, Pennsylvania
BH No. 76374-00

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pennsylvania
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

BUREAU OF FORESTRY

Date April 15, 2010

PNDI Number: 20100412238364
Update for 189205

Phil DePoe
Buchart Horn, Inc.
445 West Philadelphia Street
York, PA 17401
Fax: 717-852-1615 (hard copy will not follow)

Re: Chambersburg 537 Plan
County: Franklin Township/Municipality: Chambersburg

Dear Mr. DePoe,

Thank you for submission of the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt Number 20100412238364 for review. PA Department of Conservation and Natural Resources screened this project for potential impacts to species and resources of concern under DCNR's responsibility, which includes plants, terrestrial invertebrates, natural communities, and geologic features only.
No Impact Anticipated

PNDI records indicate species or resources of concern are located in the vicinity of the project. However, based on the information you submitted concerning the nature of the project, the immediate location, and our detailed resource information, DCNR has determined that no impact is likely. No further coordination with our agency is needed for this project.

This response represents the most up-to-date summary of the PNDI data files and is valid for one (1) year from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on-site. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

Should the proposed work continue beyond the period covered by this letter, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative and accurate map). If the proposed work has not changed and no additional information concerning listed species is found, the project will be cleared for PNDI requirements under this agency for an additional year.

This finding applies to impacts to DCNR only. To complete your review of state and federally-listed threatened and endangered species and species of special concern, please be sure the U.S. Fish and Wildlife Service, PA Game Commission, and the Pennsylvania Fish and Boat Commission have been contacted regarding this project as directed by the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Sincerely,

Richard Shockey, Environmental Review Specialist FOR Chris Firestone, Wild Plant Program Mgr. Ph: 717-772-0263 F: 717-772-0271 ~ c-rshockey@state.pa.us

APPENDIX 2

CONSTRUCTION COST ESTIMATES

OPINION OF PROBABLE CONSTRUCTION COST

Client: Borough of Chambersburg
Location: Chambersburg, PA
Subject: WWTP - 537 Plan
Common to both Alternatives
Burdens:
State Sales Tax: 0.0%
Labor Burden (Payroll Taxes & Insur.): 55%

Estimate No.: **76374**
Estimator: EGW
Checker: MP

04/02/08

12-Oct-10

Approx. cost = $21,046,300

DESCRIPTION OF WORK	QUANTITY	UNIT	UNIT PRICE MATERIAL	TOT. EST. MATERIAL	UNIT PRICE LABOR	TOT. EST. LABOR	UNIT PRICE EQUIPMENT	TOT. EST. EQUIPMENT	UNIT PRICE SUBCONT.	SUBCONT.	TOTAL W/ BURDENS
				$0		$0		$0		$0	$0
Headworks				$0		$0		$0		$0	$0
Add Raw Waste pump- 10% install	2	ea	95,600.00	$191,200	9,580.00	$19,160		$0		$0	$340,790
Piping, mods	1	ls		$0		$0		$0	18,000.00	$18,000	$27,770
				$0		$0		$0		$0	$0
Add screen system 10% install	1	ls	137,500.00	$137,500	13,750.00	$13,750		$0		$0	$245,008
				$0		$0		$0		$0	$0
Add dumpster	1	ls	6,600.00	$6,600		$0		$0	6,600.00	$6,600	$20,364
Cover 25' x 12'	300	sf		$0		$0		$0	56.00	$16,800	$25,918
Conveyors - two total feet	90	lf		$0		$0		$0	1,100.00	$99,000	$152,732
10% install	90	lf		$0		$0		$0	110.00	$9,900	$15,273
				$0		$0		$0		$0	$0
Primary Clarifiers				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
Add drop box - Option A	1	ls		$0		$0		$0	29,000.00	$29,000	$44,740
Cut openings	1	ls		$0		$0		$0	5,300.00	$5,300	$8,177
SS Slide gate	1	ea	14,600.00	$14,600	4,200.00	$4,200	2,300.00	$2,300		$0	$36,116
				$0		$0		$0		$0	$0
Add splitter Box Option B	1	ls		$0		$0		$0	46,000.00	$46,000	$70,967
SS Slide gates - 6'	2	ea	14,600.00	$29,200	4,200.00	$8,400	2,300.00	$4,600		$0	$72,232
Weirs, etc	1	ls		$0		$0		$0	4,100.00	$4,100	$6,325
				$0		$0		$0		$0	$0
VLR # 1				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
Add Additional Equipment	1	ls	105,800.00	$105,800		$0		$0		$0	$163,223
25% Demo & Install	1	ls		$0	26,500.00	$26,500		$0		$0	$63,368
Site work - some rock	1	ls		$0		$0		$0	80,000.00	$80,000	$123,420
Tanks: 30' x 30', 33' x 33'	2500	sf		$0		$0		$0	80.00	$200,000	$308,550
				$0		$0		$0		$0	$0
Demo Existing Blowers	1	ls		$0		$0		$0		$0	$0
Install New Blowers	1	ls		$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
VLR # 2				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
VLR Equipment	1	ls	1,155,000.00	$1,155,000		$0		$0		$0	$1,781,876
12.5% Install	1	ls		$0	144,500.00	$144,500		$0		$0	$345,537
Site work - rock	1	ls		$0		$0		$0	220,000.00	$220,000	$339,405
Tanks: 110' x 154' , 30' x 30', 33' x 33	18500	sf		$0		$0		$0	80.00	$1,480,000	$2,283,270
				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
Flow From Primary Clar. to VLRs				$0		$0		$0		$0	$0
both units				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0

42" 45 elbow DI	4	ea	11,200.00	$44,800	620.00	$2,480	400.00	$1,600		$0	$77,514
42" 90 elbow DI	8	ea	13,300.00	$106,400	820.00	$6,560	485.00	$3,880		$0	$185,821
42" pipe DI	700	lf	175.00	$122,500	80.00	$56,000	70.00	$49,000		$0	$398,492
Trench/backfill	700	lf		$0		$0		$0	140.00	$98,000	$151,190
				$0		$0		$0		$0	$0
From VLR # 2 to Sec Clar. Sp. Box				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
30" tee DI	1	ea	13,780.00	$13,780	820.00	$820	360.00	$360		$0	$23,775
36" 45 elbow DI	3	ea	7,700.00	$23,100	460.00	$1,380	265.00	$795		$0	$40,164
36" 90 elbow DI	4	ea	11,000.00	$44,000	620.00	$2,480	360.00	$1,440		$0	$76,033
36" pipe DI	270	lf	145.00	$39,150	66.00	$17,820	45.00	$12,150		$0	$121,755
Trench/backfill	270	lf		$0		$0		$0	120.00	$32,400	$49,985
				$0		$0		$0		$0	$0
Sec. Clar. Splitter box				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
Add 2 weirs	1	ls		$0		$0		$0	6,600.00	$6,600	$10,182
				$0		$0		$0		$0	$0
Box mods	1	ls		$0		$0		$0	9,900.00	$9,900	$15,273
				$0		$0		$0		$0	$0
Splitter Box to Sec. Clar.				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
30" pipe DI	500	lf	115.00	$57,500	52.00	$26,000	26.00	$13,000		$0	$170,937
30" 90 elbows DI	8	ea	8,200.00	$65,600	460.00	$3,680	230.00	$1,840		$0	$112,843
30" 45 elbows DI	4	ea	5,800.00	$22,400	460.00	$1,840	230.00	$920		$0	$40,377
Trench/backfill	500	lf		$0		$0		$0	92.00	$46,000	$70,967
24" pipe DI	240	lf	82.00	$19,680	32.00	$7,680	13.00	$3,120		$0	$53,540
24" 45 elbows DI	10	ea	4,000.00	$40,000	350.00	$3,500	150.00	$1,500		$0	$72,394
Trenching/backfill	240	lf		$0		$0		$0	80.00	$19,200	$29,621
				$0		$0		$0		$0	$0
Two New 88' Sec. Clarifiers				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
Equipment - 2 units 10% install.	1	ls	346,500.00	$346,500	34,600.00	$34,600		$0		$0	$617,301
				$0		$0		$0		$0	$0
Concrete, misc. metal, etc	2	ea		$0		$0		$0	300,000.00	$600,000	$925,650
				$0		$0		$0		$0	$0
Excav/backfill	2	ea		$0		$0		$0	75,000.00	$150,000	$231,413
Rock - blasting	1	ls		$0		$0		$0	25,000.00	$25,000	$38,569
				$0		$0		$0		$0	$0
Algae sweep system incl. Install.	2	ea	37,400.00	$74,800	3,800.00	$7,600		$0		$0	$133,571
				$0		$0		$0		$0	$0
Paint launders	1	ls		$0		$0		$0	12,000.00	$12,000	$18,513
				$0		$0		$0		$0	$0
Access roadway 12' x 300' = 400 sy				$0		$0		$0		$0	$0
Stone base	400	sy	13.00	$5,200	0.60	$240	1.50	$600		$0	$9,522
4" binder	400	sy	12.00	$4,800	2.00	$800	2.00	$800		$0	$10,552
3" wearing	400	sy	10.00	$4,000	2.00	$800	2.00	$800		$0	$9,318
Site excav., etc	1	ls		$0		$0		$0	4,500.00	$4,500	$6,942
				$0		$0		$0		$0	$0
Sec. Clar. to UV				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
36" x 24" wye DI	2	ea	14,700.00	$29,400	700.00	$1,400	400.00	$800		$0	$49,939
24" pipe DI	100	lf	82.00	$8,200	32.00	$3,200	13.00	$1,300		$0	$22,308
Trenching/backfill - assume deep	100	lf		$0		$0		$0	80.00	$8,000	$12,342
24" fittings ??	6	ea	4,000.00	$24,000	350.00	$2,100	150.00	$900		$0	$43,436
				$0		$0		$0		$0	$0
BFP				$0		$0		$0		$0	$0

Demo Existing Belt Filter Presses	2	ls		$0		$0		$0	8,000.00	$16,000	$24,684
Demo conveyor	1	ls		$0		$0		$0	5,000.00	$5,000	$7,714
Demo Polymer System	1	ls		$0		$0		$0	7,500.00	$7,500	$11,571
Demo Lime Conveyor	1	ls		$0		$0		$0	5,000.00	$5,000	$7,714
Demo Lime Silo	1	ls		$0		$0		$0	15,000.00	$15,000	$23,141
				$0		$0		$0		$0	$0
2.0 Meter Belt Filter Press	3	ea	255,000.00	$765,000	25,500.00	$76,500		$0		$0	$1,363,135
- 304 SST Frame Adder	3	ea	32,000.00	$96,000		$0		$0		$0	$148,104
				$0		$0		$0		$0	$0
Polymer System	3	ea	12,000.00	$36,000	2,400.00	$7,200		$0		$0	$72,756
				$0		$0		$0		$0	$0
New Conveyor System	100	lf		$0		$0		$0	1,100.00	$110,000	$169,703
				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
RAS Pumps and Piping				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
pumps	1	ls	209,000.00	$209,000	20,900.00	$20,900		$0		$0	$372,412
20" DIP and fittings	260	lf	150.00	$39,000	60.00	$15,600	30.00	$7,800		$0	$109,504
				$0		$0		$0		$0	$0
New Scum Box	2	ls		$0		$0		$0	50,000.00	$100,000	$154,275
Pumps	1	ls	76,450.00	$76,450		$0		$0		$0	$117,943
				$0		$0		$0		$0	$0
ph System	1	ls	330,000.00	$330,000	33,000.00	$33,000		$0		$0	$588,019
				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
Gravity Thickener				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
Dilution water system	1	ls		$0		$0		$0	55,000.00	$55,000	$84,851
4" DI piping	250	lf	16.00	$4,000	8.00	$2,000	5.00	$1,250		$0	$12,882
4" DI Fittings	8	ea	250.00	$2,000	90.00	$720		$0		$0	$4,807
trench/backfill	250	lf		$0		$0		$0	30.00	$7,500	$11,571
				$0		$0		$0		$0	$0
RAS/Blower Building				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
2 story - 38' x 22' Masonry	850	sf		$0		$0		$0	180.00	$153,000	$236,041
Site work	1	ls		$0		$0		$0	26,000.00	$26,000	$40,112
RAS Pumps install Only	1	ls		$0	64,000.00	$64,000		$0		$0	$153,041
Blowers - install Only	1	ls		$0	120,000.00	$120,000		$0		$0	$286,952
Rotary Drum Moyno Pumps	3	ea	25,000.00	$75,000	2,500.00	$7,500		$0		$0	$133,641
Interior piping	1	ls		$0		$0		$0	150,000.00	$150,000	$231,413
Sump pump	1	ls	5,400.00	$5,400	550.00	$550		$0		$0	$9,646
				$0		$0		$0		$0	$0
Blower lines 6" DI	600	lf	17.00	$10,200	10.00	$6,000	5.00	$3,000		$0	$34,712
Fittings	14	ea	300.00	$4,200	100.00	$1,400		$0		$0	$9,827
Trenching/backfill	800	lf		$0		$0		$0	65.00	$52,000	$80,223
Fittings ????	18	ea	1,800.00	$32,400	250.00	$4,500	100.00	$1,800		$0	$63,523
				$0		$0		$0		$0	$0
RAS Splitter Box				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
Box - incl excav/bkfill	1	ls		$0		$0		$0	70,000.00	$70,000	$107,993
Weirs	1	ls		$0		$0		$0	8,500.00	$8,500	$13,113
Slide gates	2	ea	16,500.00	$33,000	6,000.00	$12,000	4,000.00	$8,000		$0	$91,948
				$0		$0		$0		$0	$0
Anerobic Selector tank				$0		$0		$0		$0	$0
25' x 55' two tanks	2800	sf		$0		$0		$0	80.00	$224,000	$345,576
Site work	2800	sf		$0		$0		$0	10.00	$28,000	$43,197

Rock?				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
Anoxic Selector				$0		$0		$0		$0	$0
25' x 88' two tanks	5600	sf		$0		$0		$0	80.00	$448,000	$691,152
Site work	5600	sf		$0		$0		$0	10.00	$56,000	$86,394
Rock				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
Re-aeration Tanks				$0		$0		$0		$0	$0
25' x 36' two tanks	1800	sf		$0		$0		$0	80.00	$144,000	$222,156
Sitework	1800	sf		$0		$0		$0	10.00	$18,000	$27,770
Rock				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
SCADA Upgrades	1	ls		$0		$0		$0	240,000.00	$240,000	$370,260
				$0		$0		$0		$0	$0
ELECTRICAL	1	ls		$0		$0		$0	1,925,000.00	$1,925,000	$2,969,794
Power & instrumentation				$0		$0		$0		$0	$0
Generator - 1200 kW - Diesel	1	ls	395,200.00	$395,200	39,500.00	$39,500		$0		$0	$704,150
Power Feed to ATS	300	lf		$0		$0		$0	1,000.00	$300,000	$462,825
Concrete Pad	300	sqft		$0		$0		$0	88.00	$26,400	$40,729
				$0		$0		$0		$0	$0
				==========		==========		==========		==========	==========
				$4,848,560		$808,860		$123,555		$7,416,200	$21,046,270
Mean's Local Cost Adjustment			0.00%	$0	0.00%	$0	0.00%	$0		n/a	
				==========		==========		==========		==========	
				$4,848,560		$808,860		$123,555		$7,416,200	
Taxes & Insurance				$0		$444,873		n/a		n/a	
				==========		==========		==========		==========	
				$4,848,560		$1,253,733		$123,555		$7,416,200	

ESTIMATE SUMMARY:

MATERIAL:		$4,848,560
LABOR:		$1,253,733
EQUIPMENT:		$123,555
SUBCONTRACTS:		$7,416,200
		==========
ADD-ONS:		$13,642,048
GEN. CONDITIONS & OVERHEAD:	10%	$1,364,205
		==========
		$15,006,253
PROFIT:	10%	$1,500,625
		==========
		$16,506,878
BONDING & INSURANCE:	2%	$330,138
		==========
		$16,837,016
CONTINGENCY:	25%	$4,209,254
		==========
		$21,046,270
INFLATION - ONE YEAR:	0%	$0
		==========
		$21,046,270
OPINION OF PROBABLE CONSTRUCTION COST		**$21,046,300**

OPINION OF PROBABLE CONSTRUCTION COST

Client: Borough of Chambersburg
Location: Chambersburg, PA
Subject: WWTP - 537 Plan
Alternative # 1

Estimate No.: **76374**
Estimator: EGW
Checker: MP

12-Oct-10

Burdens:
State Sales Tax: 0.0%
Labor Burden (Payroll Taxes & Insur.): 55%

03/07/07

Approx. cost = $11,574,300

DESCRIPTION OF WORK	QUANTITY	UNIT	UNIT PRICE MATERIAL	TOT. EST. MATERIAL	UNIT PRICE LABOR	TOT. EST. LABOR	UNIT PRICE EQUIPMENT	TOT. EST. EQUIPMENT	UNIT PRICE SUBCONT.	SUBCONT.	TOTAL W/ BURDENS
				$0		$0		$0		$0	$0
ThermAer Reactor				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
Equipment - Base proposal	1	ls	2,362,000.00	$2,362,000		$0		$0		$0	$3,643,976
10% install	1	ls		$0	236,200.00	$236,200		$0		$0	$564,816
				$0		$0		$0		$0	$0
Valve package	1	ls	496,000.00	$496,000		$0		$0		$0	$765,204
10% install	1	ls		$0	49,600.00	$49,600		$0		$0	$118,607
				$0		$0		$0		$0	$0
Tank - 40 x 60	7200	sf		$0		$0		$0	80.00	$576,000	$888,624
Site work	1	ls		$0		$0		$0	72,000.00	$72,000	$111,078
				$0		$0		$0		$0	$0
RAS/Blower bldg.				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
Single story - 20'W x 80'L x 12' H	2400	sf		$0		$0		$0	180.00	$432,000	$666,468
site work	1	ls		$0		$0		$0	31,000.00	$31,000	$47,825
Equipment - above				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
Interior piping	1	ls		$0		$0		$0	92,500.00	$92,500	$142,704
				$0		$0		$0		$0	$0
BioFilter				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
Concrete shelter 30' x 60' x 10'	1800	sf		$0		$0		$0	150.00	$270,000	$416,543
Site work	1	ls		$0		$0		$0	16,000.00	$16,000	$24,684
				$0		$0		$0		$0	$0
12" DIP	150	lF	32.00	$4,800	15.00	$2,250	7.00	$1,050		$0	$14,405
12" DI Fitings	6	ea	725.00	$4,350	150.00	$900	65.00	$390		$0	$9,465
trench/backfill	150	lf		$0		$0		$0	50.00	$7,500	$11,571
				$0		$0		$0		$0	$0
Solids Handling Bldg				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
Demo 2 drum thickeners	2	ls		$0		$0		$0	7,700.00	$15,400	$15,400
				$0		$0		$0		$0	$0
Two new Belt Thickeners	2	ea	170,000.00	$340,000	17,000.00	$34,000		$0		$0	$392,700
- 304 SST Frame Adder	2	ea	6,700.00	$13,400		$0		$0		$0	$13,400
				$0		$0		$0		$0	$0
Polymer System	2	ea	12,000.00	$24,000	2,400.00	$4,800		$0		$0	$31,440
				$0		$0		$0		$0	$0
New Conveyor System	65	lf		$0		$0		$0	1,100.00	$71,500	$71,500
				$0		$0		$0		$0	$0
DEMOLITION	1	ls		$0		$0		$0	35,000.00	$35,000	$53,996
				$0		$0		$0		$0	$0
Concrete Tank Covers				$0		$0		$0		$0	$0

two - 70' diam., 12" thick	300	cy		$0	150.00	$45,000	26.00	$7,800	900.00	$270,000	$536,183
Columns	100	cy		$0	325.00	$32,500	35.00	$3,500	900.00	$90,000	$221,963
Insul.	7750	sf	11.00	$85,250	6.00	$46,500		$0		$0	$242,713
				$0		$0		$0		$0	$0
Piping - 12" TA tanks to SNDR	150	lf	32.00	$4,800	15.00	$2,250	7.00	$1,050		$0	$14,405
Fittings	12	ea	700.00	$8,400	150.00	$1,800	60.00	$720		$0	$18,374
trench/backfill	150	lf		$0		$0		$0	50.00	$7,500	$11,571
				$0		$0		$0		$0	$0
Phosphorus Removal				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
Pumps	2	ea	2,500.00	$5,000	250.00	$500		$0		$0	$8,909
Tanks - 1500 gal.	2	ea	2,650.00	$5,300	265.00	$530		$0		$0	$9,444
Piping	1	ls	4,500.00	$4,500	3,600.00	$3,600		$0		$0	$15,551
				$0		$0		$0		$0	$0
ELECTRICAL	1	ls		$0		$0		$0	1,430,000.00	$1,430,000	$2,206,133
				$0		$0		$0		$0	$0
				$0		$0		$0		$0	$0
				==========		==========		==========		==========	==========
				$3,357,800		$460,430		$14,510		$3,416,400	$11,289,652
Mean's Local Cost Adjustment			0.00%	$0	0.00%	$0	0.00%	$0		n/a	
				==========		==========		==========		==========	
				$3,357,800		$460,430		$14,510		$3,416,400	
Taxes & Insurance				$0		$253,237		n/a		n/a	
				==========		==========		==========		==========	
				$3,357,800		$713,667		$14,510		$3,416,400	

ESTIMATE SUMMARY:

MATERIAL:		$3,357,800
LABOR:		$713,667
EQUIPMENT:		$14,510
SUBCONTRACTS:		$3,416,400
		==========
ADD-ONS:		$7,502,377
GEN. CONDITIONS & OVERHEAD:	10%	$750,238
		==========
		$8,252,614
PROFIT:	10%	$825,261
		==========
		$9,077,876
BONDING & INSURANCE:	2%	$181,558
		==========
		$9,259,433
CONTINGENCY:	25%	$2,314,858
		==========
		$11,574,291
INFLATION - ONE YEAR:	0%	$0
		==========
		$11,574,291
OPINION OF PROBABLE CONSTRUCTION COST		**$11,574,300**

APPENDIX 3

PUBLIC NOTICE, COMMENTS, & RESPONSES

Proof of Publication of Legal Notice

(Under Provisions of "Newspaper Advertising Act" of Pennsylvania and its Supplements)

STATEMENT

It is hereby stated and declared that PUBLIC OPINION is a daily newspaper, as defined under the "Newspaper Advertising Act" of the Commonwealth of Pennsylvania approved May 16, 1929, and its several supplements and amendments, published at its place of business in the Borough of Chambersburg, Franklin County, Pennsylvania, and is of a general circulation throughout the County; that it was established as a daily newspaper in the year 1901 and has been issued regularly, continuously circulated and distributed from the date of its establishment to the present time; that said newspaper is owned by Texas-New Mexico Newspapers Partnership and published by Texas-New Mexico Newspapers Partnership, a partnership organized and existing under the laws of the State of Delaware, whose established place of business is located at 77 North Third Street, Chambersburg, Pennsylvania.

THAT a legal notice, a true copy of which exactly as printed and published, is securely attached hereto, was published and appeared in the regular editions and issues of PUBLIC OPINION on the following dates, viz:

2/27/09

Copy of Notice or Publication

PUBLIC NOTICE

The Borough of Chambersburg intends to adopt an Act 537 Sewage Facilities Plan to address the sewage treatment needs of the Borough and portions of Greene, Guilford and Hamilton Townships. The Plan calls for treatment and solids dewatering system improvements and a projected 30% gradual increase in user rates. The Plan is available for public review and comment at the Chambersburg Borough Hall, 2nd floor, 100 South Second Street, Chambersburg, PA. Review of the document is available beginning February 27, 2009 during normal business hours. Written comments must be received by March 30, 2009 and sent to the attention of Eric W. Over Borough Manager, 100 South Second Street, Chambersburg, PA 17201. 418

RECEIVED
MAR 06 2009
BOROUGH OF CHAMBERSBURG

Texas-New Mexico Newspapers Partnership

Commonwealth of Pennsylvania

County of Franklin on the 2nd day of March, 2009 before me

the subscriber, a Notary Public in and for said state and County,

personally come the above-named Melinda Woods who having been by me duly sworn according to law on his oath

deposes and says that he/she is the Staff Accountant of Texas-New Mexico Newspapers Partnership, and is a designated agent duly authorized by resolution of the Board of Directors of said corporation to make the foregoing statement and this affidavit on its behalf: that the affiant is not interested in the subject matter of the notice or advertising referred to in the foregoing statement and that all of the allegations contained in the foregoing statement as to the time, place and character of publication therein referred to are true.

NOTARIAL SEAL
CONSTANCE E ABBOTT
Notary Public
CHAMBERSBURG BOROUGH, FRANKLIN COUNTY
My Commission Expires May 17, 2011

Sworn to and subscribed before me the day and year aforesaid.

Notary Public

My commission expires May 17, 2011

My office is maintained in the borough of Chambersburg, Franklin County, Pa.

Statement of Advertising Costs

To: Texas-New Mexico Newspapers Partnership

For publishing notice or advertisement attached Hereto on the above dates

	5 ½"
	$ 83.88
Probating same	$ 15.00
	$ 98.88

FC
PC

Franklin County Planning Commission
Administrative Annex
218 North Second Street
Chambersburg, PA 17201-1642

Phone: 717-261-3855
Fax: 717-264-8667
TDD: 717-264-8474
Email: sclayton@co.franklin.pa.us

April 7, 2009

Phil Wolgemuth, Planner
Borough of Chambersburg
100 South Second Street
Chambersburg, PA 17201

RE: Act 537 Plan

Dear Mr. Wolgemuth,

The Franklin County Planning Department recently received a copy of the proposed Chambersburg Borough Act 537 Plan. Staff has reviewed the plan and finds that Section IV, pertaining to the Franklin County Planning Documents, is inaccurate and needs to be amended. Upon revising this text, we would recommend the plan for approval.

If you have any questions, please feel free to contact this office.

Sincerely,

Phil Tarquino
Director

PAT/slc
c: file

DePoe, Phil

From: Schober, Mike
Sent: Thursday, April 09, 2009 4:44 PM
To: DePoe, Phil
Subject: FW: Act 537 Plan Revision

From: tmickey@chbgboro.com [mailto:tmickey@chbgboro.com]
Sent: Thursday, April 09, 2009 2:44 PM
To: Schober, Mike
Cc: Eric
Subject: Fwd: Act 537 Plan Revision

Mike - here are the Franklin County Planning Commission changes for the 537 Plan - Page IV - 2 (Section IV.A.1d.)

Our Planner obtained this information from the County Planner. Hope it helps. Tannie

Tanya Mickey
Borough Secretary
Borough of Chambersburg
100 South Second Street
Chambersburg, PA 17201
phone- 717-261-3254
fax - 717-264-0224

-----Original Message-----
From: pwolgemuth@chbgboro.com [mailto:pwolgemuth@chbgboro.com]
Sent: Thursday, April 9, 2009 01:19 PM
To: 'Mickey, Tannie'
Subject: Act 537 Plan Revision

Hi Tannie,

In response to Phil Tarquino's letter regarding the Act 537 Plan, the information in Section IV should be removed and replaced with the following:

Section IV.A.1.d. Franklin County Land Planning Documents (Page IV-2)

The Franklin County Comprehensive Plan, adopted in 1999, includes an objective for new development to be directed toward areas already served or adjacent to areas served by central water and sewer systems.

Please see me with questions or if you need more information.

Thanks.

Phil

Previous Information:

IV.A.1.d. Franklin County Land Planning Documents

The following planning documents were developed by Franklin County and are applicable to all municipalities within its boundaries.

- *Subdivision and Land Development Ordinance* – Adopted September 1991, last amended January 1997. This Ordinance sets the minimum standards for growth and development throughout the County. The jurisdictional section of the document states that where more stringent requirements are set forth at the Municipal level, then the more stringent requirements apply.
- *Comprehensive Plan* – 2006. The County is currently in the process of updating sections of this plan. The County plan utilizes an Urban Growth Boundaries (UGBs) concept to ensure the orderly extension of development. Proposed new development is directed toward areas already served or adjacent to areas served by central water and sewer systems.

APPENDIX 4

PLAN ADOPTION

RESOLUTION

WHEREAS, Section 5 of the Act of January 24, 1966, P. L. 1535, No. 537, known as the "Pennsylvania Sewage Facilities Act," as amended, and the Rules and Regulations of the Department of Environmental Protection (Department) adopted there under, 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 water 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 Borough of Chambersburg has prepared an Act 537 Sewage Facilities Plan dated February, 2009 which provides for sewage facilities in Chambersburg Borough and portions of Greene, Guilford and Hamilton Townships (with a portion of Letterkenny Township being served through Hamilton Township) , said sewage facilities consisting of the proposed upgrade and expansion of the J. Hase Mowrey Regional Wastewater Treatment Plant as outlined in the Alternatives of the Plan, and

WHEREAS, Chambersburg Borough finds that the Sewage Facilities Plan conforms to applicable zoning, subdivision, and other municipal ordinances and plans and to a comprehensive program of pollution control and water quality management.

NOW, THEREFORE, BE IT RESOLVED, that the Mayor and Town Council of the Borough of Chambersburg hereby adopt and submit to the Department of Environmental Protection for its approval as a revision of the "Official Plan" of the municipality, the above referenced Sewage Facilities Plan. The municipality hereby assures the Department of the complete and timely implementation of the said plan as required by law (Section 5, Pennsylvania Sewage Facilities Act, as amended).

THIS RESOLUTION DULY ADOPTED according to law on this 13th day of April, 2009 at a duly advertized meeting of the Borough Council of the Borough of Chambersburg.

BOROUGH OF CHAMBERSBURG

By _____

William F. McLaughlin,
President, Borough Council

Attest:

_____

Tanya Mickey, Borough Secretary

H:\COUNCIL INFO\RESOLUTION - Act 537 Plan - 4-13-09.doc

APPENDIX 5

ACT 537 PLAN CHECK LIST

PART 2 ADMINISTRATIVE COMPLETENESS CHECKLIST

DEP Use Only	Indicate Page #(s) in Plan	In addition to the main body of the plan, the plan must include items one through eight listed below to be accepted for formal review by the department. Incomplete Plans will be returned unless the municipality is clearly requesting an advisory review.
_____	TC	1. **Table of Contents**
		2. **Plan Summary**
_____	PS-1	A. Identify the proposed service areas and major problems evaluated in the plan. (Reference - Title 25, §71.21.a.7.i).
_____	PS-2	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).
_____	PS-3	C. Present the estimated 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).
_____	PS-3	D. Identify the municipal commitments necessary to implement the Plan. (Reference Title 25, §71.21.a.7.iii).
_____	PS-4	E. Provide a schedule of implementation for the project that identifies the MAJOR milestones with dates necessary to accomplish the project to the point of operational status. (Reference Title 25, §71.21.a.7.iv).
_____	Appx 4	3. **Municipal Adoption: Original,** signed and sealed Resolution of Adoption by the municipality which contains, at a minimum, alternatives chosen and a commitment to implement the Plan in accordance with the implementation schedule. (Reference Title 25, §71.31.f) Section V.F. of the Planning Guide.
_____	Appx 1	4. **Planning Commission / County Health Department Comments**: 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 area wide jurisdiction (where applicable), and any existing county or joint county departments of health. (Reference-Title 25, §71.31.b) Section V.E.1 of the Planning Guide.
_____	Appx 3	5. **Publication:** Proof of Public Notice which documents the proposed plan adoption, plan summary, and the establishment and conduct of a 30 day comment period. (Reference-Title 25, §71.31.c) Section V.E.2 of the Planning Guide.
_____	Appx 3	6. **Comments and Responses**: Copies 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 the Planning Guide.
_____	VIII-3	7. **Implementation Schedule:** A complete project implementation schedule with milestone dates specific for each existing and future area of need. Other activities in the project implementation schedule should be indicated as occurring a finite number of days from a major milestone. (Reference-Title 25, §71.31.d) Section V.F. of the Planning Guide. 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.c).
_____	Appx 1	8. **Consistency Documentation:** 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 the Planning Guide.

PART 3 GENERAL PLAN CONTENT CHECKLIST

DEP Use Only	Indicate Page #(s) in Plan		Item Required
_____	I-1	I.	**Previous Wastewater Planning**
			A. Identify, describe and briefly analyze all past wastewater planning for its impact on the current planning effort:
_____	I-1		1. Previously undertaken under the Sewage Facilities Act (Act 537). (Reference-Act 537, Section 5 §d.1).
_____	I-1		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 the Planning Guide.
_____	I-1		3. Is anticipated or planned by applicable sewer authorities or approved under a Chapter 94 Corrective Action Plan. (Reference-Title 25, §71.21.a.5.i.A&B). Section V.D. of the Planning Guide.
_____	I-1		4. Through planning modules for new land development, planning "exemptions" and addenda. (Reference-Title 25, §71.21.a.5.i.A).
_____	II-1	II.	**Physical and Demographic Analysis utilizing written description and mapping** (All items listed below require maps, and all maps should show all current lots and structures and be of appropriate scale to clearly show significant information).
_____	II-1		A. Identification of planning area(s), municipal boundaries, Sewer Authority/Management Agency service area boundaries. (Reference-Title 25, §71.21.a.1.i).
_____	II-1		B. Identification of physical characteristics (streams, lakes, impoundments, natural conveyance, channels, drainage basins in the planning area). (Reference-Title 25, §71.21.a.1.ii).
_____	II-1		C. Soils - Analysis with description by soil type and soils mapping for areas not presently served by sanitary sewer service. Show areas suitable for in-ground onlot systems, elevated sand mounds, individual residential spray irrigation systems, and areas unsuitable for soil dependent systems. (Reference-Title 25, §71.21.a.1.iii). Show Prime Agricultural Soils and any locally protected agricultural soils. (Reference-Title 25, §71.21.a.1.iii).
_____	II-1		D. Geologic Features - (1) Identification through analysis, (2) mapping and (3) their relation to existing or potential nitrate-nitrogen pollution and drinking water sources. Include areas where existing nitrate-nitrogen levels are in excess of 5 mg/L. (Reference-Title 25, §71.21.a.1.iii).
_____	II-1		E. Topography - Depict areas with slopes that are suitable for conventional systems; slopes that are suitable for elevated sand mounds and slopes that are unsuitable for onlot systems. (Reference-Title 25, §71.21.a.1.ii).
_____	II-1		F. Potable Water Supplies - Identification through mapping, description and analysis. Include public water supply service areas and available public water supply capacity and aquifer yield for groundwater supplies. (Reference-Title 25 §71.21.a.1.vi). Section V.C. of the Planning Guide.

_____ II-1 G. Wetlands-Identify wetlands as defined in Title 25, Chapter 105 by description, analysis and mapping. Include National Wetland Inventory mapping and potential wetland areas per USDA, SCS mapped hydric soils. 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 of the Planning Guide.

_____ III-1 **III. Existing Sewage Facilities in the Planning Area - Identifying the Existing Needs**

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

_____ III-1 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, §71.21a.2.i.A).

_____ III-10 2. A narrative and schematic diagram of the facility's basic treatment processes including the facility's NPDES permitted capacity, and the Clean Streams Law permit number. (Reference-Title 25, §71.21.a.2.i.A).

_____ III-13 3. A description of problems with existing facilities (collection, conveyance and/or treatment), including existing or projected overload under Title 25, Chapter 94 (relating to municipal wasteload management) or violations of the NPDES permit, Clean Streams Law permit, or other permit, rule or regulation of DEP. (Reference-Title 25, §71.21.a.2.i.B).

_____ III-14 4. Details of scheduled or in-progress upgrading or expansion of .treatment facilities and the anticipated completion date of the improvements. Discuss any remaining reserve capacity and the policy concerning the allocation of reserve capacity. 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).

_____ III-14 5. A detailed description of the municipality's operation and maintenance requirements for small flow treatment facility systems, including 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).

_____ III-14 6. Disposal areas, if other than stream discharge, and any applicable groundwater limitations. (Reference-Title 25, §71.21.a.4.i & ii).

_____ III-14 B. Using DEP's publication titled *Sewage Disposal Needs Identification*, identify, map and describe areas that utilize individual and community onlot sewage disposal and, unpermitted collection and disposal systems ("wildcat" sewers, borehole disposal, etc.) and retaining tank systems in the planning area including:

_____ III-14 1. The types of onlot systems in use. (Reference-Title 25, §71.21.a.2.ii.A).

_____ III-14 2. A sanitary survey complete with description, map and tabulation 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 Stream Law or regulations promulgated thereunder. (Reference-Title 25, §71.21.a.2.ii.B).

_____ III-14 3. A comparison of the types of onlot 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).

_____ III-14 4. An individual water supply survey to identify possible contamination by malfunctioning onlot sewage disposal systems consistent with DEP's *Sewage Disposal Needs Identification* publication. (Reference-Title 25 §71.21.a.2.ii.B).

_____ III-14 5. Detailed description of operation and maintenance requirements of the municipality for individual and small volume community onlot systems, including 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).

_____ III-15 C. Identify wastewater sludge and septage generation, transport and disposal methods. Include this information in the sewage facilities alternative analysis including:

_____ III-15 1. Location of sources of wastewater sludge or septage (Septic tanks, holding tanks, wastewater treatment facilities). (Reference-Title 25 §71.71).

_____ III-15 2. Quantities of the types of sludges or septage generated. (Reference-Title 25 §71.71).

_____ III-15 3. Present disposal methods, locations, capacities and transportation methods. (Reference-Title 25 §71.71).

_____ IV-1 **IV. Future Growth and Land Development**

A. Identify and briefly summarize all municipal and county planning documents adopted pursuant to the Pennsylvania Municipalities Planning Code (Act 247) including:

_____ IV-1 1. All land use plans and zoning maps that identify residential, commercial, industrial, agricultural, recreational and open space areas. (Reference-Title 25, §71.21.a.3.iv).

_____ IV-3 2. Zoning or subdivision regulations that establish lot sizes predicated on sewage disposal methods. (Reference – Title 25§71.21.a.3.iv).

_____ IV-3 3. All limitations and plans related to floodplain and stormwater management and special protection (Ch. 93) areas. (Reference-Title 25 §71.21.a.3.iv) Appendix B, Section II.F of the Planning Guide.

B. Delineate and describe the following through map, text and analysis.

_____ IV-4 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 EDU's remaining to be developed (include time schedule for EDU's remaining to be developed). (Reference-Title 25, §71.21.a.3.i).

_____ IV-4 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). Include a comparison of proposed land use as allowed by zoning and existing sewage facility planning. (Reference-Title 25, §71.21.a.3.iv).

_____ IV-5 3. Future growth areas with population and EDU projections for these areas using historical, current and future population figures and projections of the municipality. Discuss and evaluate discrepancies between local, county, state and federal projections as they relate to sewage facilities. (Reference-Title 25, §71.21.a.1.iv). (Reference-Title 25, §71.21.a.3.iii).

IV-7 4. Zoning, and/or subdivision regulations; local, county or regional comprehensive plans; and existing plans of any other agency relating to the development, use and protection of land and water resources with special attention to: (Reference-Title 25, §71.21.a.3.iv).

--public ground/surface water supplies

--recreational water use areas

--groundwater recharge areas

--industrial water use

--wetlands

IV-7 5. Sewage planning necessary to provide adequate wastewater treatment for five and ten year future planning periods based on projected growth of existing and proposed wastewater collection and treatment facilities. (Reference-Title 25, §71.21.a.3.v).

V-1 **V. Identify Alternatives to Provide New or Improved Wastewater Disposal Facilities**

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

V-1 1. The potential for regional wastewater treatment. (Reference-Title 25, §71.21.a.4).

V-1 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).

V-1 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).

V-2 a. Repair. (Reference-Title 25, §71.21.a.4.ii.A).

V-2 b. Upgrading. (Reference-Title 25, §71.21.a.4.ii.B).

V-2 c. Reduction of hydraulic or organic loading to existing facilities. (Reference-Title 25, §71.71).

V-2 d. Improved operation and maintenance. Reference-Title 25, §71.21.a.4.ii.C).

V-2 e. Other applicable actions that will resolve or abate the identified problems. (Reference-Title 25, §71.21.a.4.ii.D)

V-10 4. Repair or replacement of existing collection and conveyance system components. (Reference-Title 25, §71.21.a.4.ii.A)

V-10 5. The need for construction of new community sewage systems including sewer systems and/or treatment facilities. (Reference-Title 25, §71.21.a.4.iii).

V-11 6. Use of innovative/alternative methods of collection/conveyance to serve needs areas using existing wastewater treatment facilities. (Reference-Title 25, §71.21.a.4.ii.B).

V-11 B. The use of individual sewage disposal systems including individual residential spray irrigation systems based on:

V-11 1. Soil and slope suitability. (Reference-Title 25, §71.21.a.2.ii.C).

V-11 2. Preliminary hydrogeologic evaluation. (Reference-Title 25, §71.21.a.2.ii.C).

V-11 3. The establishment of a sewage management program. (Reference-Title 25, §71.21.a.4.iv). See also Part "F" below.

V-11 4. The repair, replacement or upgrading of existing malfunctioning systems in

areas suitable for onlot disposal considering: (Reference-Title 25, §71.21.a.4).

____ V-11 a. Existing technology and sizing requirements of Title 25 Chapter 73. (Reference-Title 25, §73.31-73.72).

____ V-11 b. Use of expanded absorption areas or alternating absorption areas. (Reference-Title 25, §73.16).

____ V-11 c. Use of water conservation devices. (Reference-Title 25, §71.73.b.2.iii).

____ V-11 C. The use of small flow sewage treatment facilities or package treatment facilities to serve individual homes or clusters of homes with consideration of: (Reference-Title 25, §71.64.d).

____ V-11 1. Treatment and discharge requirements. (Reference-Title 25, §71.64.d).

____ V-11 2. Soil suitability. (Reference-Title 25, §71.64.c.I).

____ V-11 3. Preliminary hydrogeologic evaluation. (Reference-Title 25, §71.64.c.2).

____ V-11 4. Municipal, Local, Agency or other controls over operation and maintenance requirements through a Sewage Management Program. (Reference-Title 25, §71.64.d). See Part "F" below.

____ V-11 D. The use of community land disposal alternatives including:

____ V-11 1. Soil and site suitability. (Reference-Title 25, §71.21.a.2.ii.C).

____ V-11 2. Preliminary hydrogeologic evaluation. (Reference-Title 25, §71.21.a.2.ii.C).

____ V-11 3. Municipality, Local Agency or Other Controls over operation and maintenance requirements through a Sewage Management Program (Reference-Title25, §71.21.a.2.ii.C). See Part "F" below.

____ V-11 4. The rehabilitation or replacement of existing malfunctioning community land disposal systems. (See Part "V", B, 4, a, b, c above). See also Part "F" below.

____ V-11 E. The use of retaining tank alternatives on a temporary or permanent basis including: (Reference- Title 25, §71.21.a.4).

____ V-11 1. Commercial, residential and industrial use. (Reference-Title 25, §71.63.e).

____ V-11 2 Designated conveyance facilities (pumper trucks). (Reference-Title 25, §71.63.b.2).

____ V-11 3. Designated treatment facilities or disposal site. (Reference-Title 25, §71.63.b.2).

____ V-11 4. Implementation of a retaining tank ordinance by the municipality. (Reference-Title 25, §71.63.c.3). See Part "F" below.

____ V-11 5. Financial guarantees when retaining tanks are used as an interim sewage disposal measure. (Reference-Title 25, §71.63.c.2).

____ V-11 F. Sewage Management Programs to assure the future operation and maintenance of existing and proposed sewage facilities through:

____ V-11 1. Municipal ownership or control over the operation and maintenance of individual onlot sewage disposal systems, small flow treatment facilities, or other traditionally non-municipal treatment facilities. (Reference-Title 25, §71.21.a.4.iv).

____ V-11 2. Required inspection of sewage disposal systems on a schedule established by the municipality. (Reference-Title 25, §71.73.b.1.).

____ V-11 3. Required maintenance of sewage disposal systems including septic and aerobic treatment tanks and other system components on a schedule

established by the municipality. (Reference-Title 25, §71.73.b.2).

_____ V-11 4. Repair, replacement or upgrading of malfunctioning onlot sewage systems. (Reference-Title 25, §71.21.a.4.iv) and §71.73.b.5 through:

_____ V-11 a. Aggressive pro-active enforcement of ordinances that require operation and maintenance and prohibit malfunctioning systems. (Reference-Title 25, §71.73.b.5).

_____ V-11 b. Public education programs to encourage proper operation and maintenance and repair of sewage disposal systems.

_____ V-11 5. Establishment of joint municipal sewage management programs. (Reference-Title 25, §71.73.b.8).

_____ V-11 6. Requirements for bonding, escrow accounts, management agencies or associations to assure operation and maintenance for non-municipal facilities. (Reference-Title 25, §71.71).

_____ V-11 G. 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).

1. Modification of existing comprehensive plans involving:

_____ V-11 a. Land use designations. (Reference-Title 25, §71.21.a.4).

_____ V-11 b. Densities. (Reference-Title 25, §71.21.a.4).

_____ V-11 c. Municipal ordinances and regulations. (Reference-Title 25, §71.21.a.4).

_____ V-11 d. Improved enforcement. (Reference-Title 25, §71.21.a.4).

_____ V-11 e. Protection of drinking water sources. (Reference-Title 25, §71.21.a.4).

_____ V-11 2. Consideration of a local comprehensive plan to assist in producing sound economic and consistent land development. (Reference-Title 25, §71.21.a.4).

_____ V-11 3. Alternatives for creating or changing municipal subdivision regulations to assure long-term use of on-site sewage disposal that consider lot sizes and protection of replacement areas. (Reference-Title 25, §71.21.a.4).

_____ V-11 4. Evaluation of existing local agency programs and the need for technical or administrative training. (Reference-Title 25, §71.21.a.4).

_____ V-11 H. A no-action alternative which includes discussion of both short-term and long-term impacts on: (Reference-Title 25, §71.21.a.4).

_____ V-11 1. Water Quality/Public Health. (Reference-Title 25, §71.21.a.4).

_____ V-11 2. Growth potential (residential, commercial, industrial). (Reference-Title 25, §71.21.a.4).

_____ V-11 3. Community economic conditions. (Reference-Title 25, §71.21.a.4).

_____ V-11 4. Recreational opportunities. (Reference-Title 25, §71.21.a.4).

_____ V-11 5. Drinking water sources. (Reference-Title 25, §71.21.a.4).

_____ V-11 6. Other environmental concerns. (Reference-Title 25, §71.21.a.4).

_____ VI-1 **VI. Evaluation of Alternatives**

A. Technically feasible alternatives 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.).

_____ VI-1 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 of the

Planning Guide.

_____ VI-1 2. Municipal wasteload management **Corrective Action Plans or Annual Reports** 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 of the Planning Guide.

_____ VI-2 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 of the Planning Guide.

_____ VI-2 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 of the Planning Guide.

_____ VI-3 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 of the Planning Guide.

_____ VI-3 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 of the Planning Guide.

_____ VI-3 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 of the Planning Guide.

_____ VI-3 8. **County Stormwater Management Plans** approved by DEP 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 of the Planning Guide.

_____ VI-3 9. **Wetland Protection.** Using wetland mapping developed under Checklist Section II.G, identify and discuss mitigative measures including the need to obtain permits for any encroachments on wetlands from the construction or operation of any proposed wastewater facilities. (Reference-Title 25, §71.21.a.5.i.I) Appendix B, Section II.I of the Planning Guide.

_____ VI-4 10. **Protection of rare, endangered or threatened plant and animal species** as identified by the Pennsylvania Natural Diversity Inventory (PNDI). (Reference-Title 25, §71.21.a.5.i.J). Provide DEP with a copy of the completed Request For PNDI Search document. Also provide a copy of the response letter from the Department of Conservation and Natural Resources' Bureau of Forestry regarding the findings of the PNDI search. Appendix B, Section II.J of the Planning Guide.

_____ VI-4 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 a Cultural Resource Notice

request of 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 of the Planning Guide.

_____ VI-4 B. Provide for the resolution of any inconsistencies in any of the points identified in Section VI.A. of this checklist by submitting a letter from the appropriate agency stating that the agency has received, reviewed and concurred with the resolution of identified inconsistencies. (Reference-Title 25, §71.21.a.5.ii). Appendix B of the Planning Guide.

_____ VI-4 C. Evaluate alternatives 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).

_____ VI-5 D. Provide cost estimates using present worth analysis for construction, financing, on going administration, operation and maintenance and user fees for alternatives identified in Section V of this checklist. Estimates shall be limited to areas identified in the plan as needing improved sewage facilities within five years from the date of plan submission. (Reference-Title 25, §71.21.a.5.iv).

_____ VI-9 E. Provide an analysis of the funding methods available to finance 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).

_____ VI-14 F. Analyze the need for immediate or phased implementation of each alternative proposed in Section V of this checklist including: (Reference-Title 25, §71.21.a.5.vi).

_____ VI-14 1. A description of any activities necessary to abate critical public health hazards pending completion of sewage facilities or implementation of sewage management programs. (Reference-Title 25, §71.21.a.5.vi.A).

_____ VI-14 2. A description of the advantages, if any, in phasing construction of the facilities or implementation of a sewage management program justifying time schedules for each phase. (Reference-Title 25, §71.21.a.5.vi.B).

_____ VI-14 G. Evaluate administrative organizations and legal authority necessary for plan implementation. (Reference - Title 25, §71.21.a.5.vi.D.).

_____ VII-1 **VII. Institutional Evaluation**

A. Provide an analysis of all existing wastewater treatment authorities, their past actions and present performance including:

_____ VII-1 1. Financial and debt status. (Reference-Title 25, §71.61.d.2).

_____ VII-1 2. Available staff and administrative resources. (Reference-Title 25, §71.61.d.2)

_____ VII-1 3. Existing legal authority to:

_____ VII-1 a. Implement wastewater planning recommendations. (Reference-Title 25, §71.61.d.2).

_____ VII-1 b. Implement system-wide operation and maintenance activities. (Reference-Title 25, §71.61.d.2).

_____ VII-1 c. Set user fees and take purchasing actions. (Reference-Title 25, §71.61.d.2).

_____ VII-1 d. Take enforcement actions against ordinance violators. (Reference-Title 25,

§71.61.d.2).

VII-1 e. Negotiate agreements with other parties. (Reference-Title 25, §71.61.d.2).

VII-1 f. Raise capital for construction and operation and maintenance of facilities. (Reference-Title 25,§71.61.d.2).

VII-2 B. Provide an analysis and description of the various institutional alternatives necessary to implement the proposed technical alternatives including:

VII-2 1. Need for new municipal departments or municipal authorities. (Reference-Title 25, §71.61.d.2).

VII-2 2. Functions of existing and proposed organizations (sewer authorities, onlot maintenance agencies, etc.). (Reference-Title 25, §71.61.d.2).

VII-2 3. Cost of administration, implementability, and the capability of the authority/agency to react to future needs. (Reference-Title 25, §71.61.d.2).

VII-2 C. Describe all necessary administrative and legal activities to be completed and adopted to ensure the implementation of the recommended alternative including:

VII-2 1. Incorporation of authorities or agencies. (Reference-Title 25, §71.61.d.2).

VII-2 2. Development of all required ordinances, regulations, standards and inter-municipal agreements. (Reference-Title 25, §71.61.d.2).

VII-2 3. Description of activities to provide rights-of-way, easements and land transfers. (Reference-Title 25, §71.61.d.2).

VII-2 4. Adoption of other municipal sewage facilities plans. (Reference-Title 25, §71.61.d.2).

VII-2 5. Any other legal documents. (Reference-Title 25, §71.61.d.2).

VII-2 6. Dates or timeframes for items 1-5 above on the project's implementation schedule.

VII-3 D. Identify the proposed institutional alternative for implementing the chosen technical wastewater disposal alternative. Provide justification for choosing the specific institutional alternative considering administrative issues, organizational needs and enabling legal authority. (Reference-Title 25, §71.61.d.2).

VIII-1 **VIII. Implementation Schedule and Justification for Selected Technical & Institutional Alternatives**

A. Identify the technical wastewater disposal alternative which best meets the wastewater treatment needs of each study area of the municipality. Justify the choice by providing documentation which shows that it is the best alternative based on:

VIII-1 1. Existing wastewater disposal needs. (Reference-Title 25, §71.21.a.6).

VIII-1 2. Future wastewater disposal needs. (five and ten years growth areas). (Reference-Title 25, §71.21.a.6).

VIII-1 3. Operation and maintenance considerations. (Reference-Title 25, §71.21.a.6).

VIII-1 4. Cost-effectiveness. (Reference-Title 25, §71.21.a.6).

VIII-1 5. Available management and administrative systems. (Reference-Title 25, §71.21.a.6).

VIII-1 6. Available financing methods. (Reference-Title 25, §71.21.a.6).

_____ VIII-1 7. Environmental soundness and compliance with natural resource planning and preservation programs. (Reference-Title 25, §71.21.a.6).

_____ VIII-2 B. Designate and describe the capital financing plan chosen to implement the selected alternative(s). Designate and describe the chosen back-up financing plan. (Reference-Title 25, §71.21.a.6)

_____ VIII-3 C. Designate and describe the implementation schedule for the recommended alternative, including justification for any proposed phasing of construction or implementation of a Sewage Management Program. (Reference – Title 25 §71.31d)

IX. Environmental Report (ER) generated from the Uniform Environmental Review Process (UER)

_____ N/A A. Complete an ER as required by the UER process and as described in the DEP Technical Guidance 381-5511-111. Include this document as "Appendix A" to the Act 537 Plan Update Revision. Note: *An ER is required only for Wastewater projects proposing funding through any of the funding sources identified in the UER.*

APPENDIX 6

CONSENT ORDER AND AGREEMENT

SALZMANN HUGHES, P.C.
Attorneys at Law
EXPERIENCE · INTEGRITY · INNOVATION

79 St. Paul Drive · Chambersburg, PA · 17201 · (717) 263-2121 · Fax: (717) 263-0663
354 Alexander Spring Road · Suite 1 · Carlisle, PA · 17015 · (717) 249-6333 · Fax: (717) 249-7334
239 E. Main St. · Waynesboro, PA · 17268 · (717) 762-3170 · Fax: (717) 762-0988
105 N. Front St. · Suite 401 · Harrisburg, PA · 17101 · (717) 234-6700 · Fax: (717) 249-7334

*Please reply to *Chambersburg Office*

March 18, 2010

Borough of Chambersburg
Mr. Jeffrey Stonehill, Borough Manager
100 South Second Street
Chambersburg, PA 17201

RE: 2nd Consent Order and Agreement

Dear Jeffrey:

Please find enclosed a fully executed original 2nd Consent Order and Agreement between the Borough and the Department of Environmental Protection dated March 10, 2010 for your file.

Very truly yours,

Salzmann Hughes, PC

By: G. Bryan Salzmann, Esquire

GBS/sal
Enclosure

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In the Matter of:

Chambersburg Borough	:	Clean Streams Law
Franklin County	:	Pennsylvania Sewage Facilities Act

SECOND CONSENT ORDER AND AGREEMENT

This Second Consent Order and Agreement is entered into this 10th day of March, 2010, by and between the Commonwealth of Pennsylvania, Department of Environmental Protection (hereinafter "Department"), and Chambersburg Borough, Franklin County.

FINDINGS

The Department has found and determined the following:

A. The Department is the agency with the duty and authority to administer and enforce the Pennsylvania Sewage Facilities Act, Act of January 24, 1966, P.L. (1965) 1535, as amended, 35 P.S. §750.1 et seq. ("Pennsylvania Sewage Facilities Act"); the Clean Streams Law, Act of June 22, 1937, P.L. 1987, as amended, 35 P.S. §691.1 et seq. ("Clean Streams Law"); Section 1917-A of the Administrative Code of 1929, Act of April 9, 1929, P.L. 177, as amended, 71 P.S. §510-17 ("Administrative Code") and the rules and regulations promulgated thereunder.

B. Chambersburg Borough ("Chambersburg" or "Borough") is a municipality in Franklin County organized and existing under the laws of the Commonwealth of Pennsylvania, with an address of 100 Second Street Chambersburg PA 17201.

C. Chambersburg's sewage and collection system is a sanitary sewer system that collects and conveys, and treats "sewage" as defined in Section 1 of the Clean Streams Law, 35 P.S. § 691.1. Tributary to Chambersburg's sanitary sewer system are sewer systems in Hamilton, Greene and Guilford Townships. A schematic showing political boundaries and the various interceptors is attached as Exhibit 1.

D. 25 Pa. Code § 94.1 defines "sewerage facilities" as "the terms used to collectively describe a plant and sewer system owned by or serving a municipality."

E. Chambersburg operates under NPDES Permit No. PA 0026051 and WQM Part II Permit No. 2896404. The plant has a permitted hydraulic design capacity of 6.8 million gallons per day as an average daily flow and 17 MGD as a peak flow. Sewage flowing to the plant is collected in a wet well before being pumped into the plant.

F. The Department and Chambersburg entered into a Consent Order and Agreement on October 30, 2007, which addressed, among other things flow metering, connections and surcharges and overflows in the Chambersburg sewage and collection system ("2007 COA").

G. The Department and Chambersburg met on several occasions in 2008, 2009 and 2010 to discuss the 2007 COA and information regarding the Chambersburg system.

H. Among other things, the Department required pursuant to Chapter 94 of the Department's regulation that Chambersburg to adopt and implement a multi-year plan to identify and administer inflow and infiltration into the Chambersburg sewerage facilities. Chambersburg indicated its willingness to adopt and implement a plan.

I. Chambersburg has told the Department that the Borough intends to submit a proposal to the Department to install additional temporary pumping capacity as a means of preventing or limiting overflows. The Department has agreed to read the report and determine if the plant has the capacity to handle the additional flows.

J. Chambersburg and its three tributary municipalities are installing additional flow meters and implementing a unified flow monitoring program. Chambersburg has told the Department that: (1) if an overflow occurs, the Borough will be able to determine which tributary interceptor(s) caused the overflow; and (2) that Chambersburg intends to institute the prohibition required by Paragraph 4(b) below only on the interceptor(s) that Chambersburg concludes caused the overflow. The Department told Chambersburg that this procedure is acceptable so long as the report that Chambersburg is required to submit pursuant to Paragraph 4(a) substantiates Chambersburg's conclusion.

ORDER

After full and complete negotiation of all matters set forth in this Consent Order and Agreement and upon mutual exchange of covenants contained herein, the parties desiring to avoid litigation and intending to be legally bound, it is hereby ORDERED by the Department and AGREED to by Chambersburg as follows:

1. **Authority.** This Consent Order and Agreement is an Order of the Department authorized and issued pursuant to: Section 5 of the Clean Streams Law, 35 P.S. § 691.5, Section 10 of the Sewage Facilities Act, 35 P.S. § 750.10, and Section 1917-A of the Administrative Code, supra. Failure of Chambersburg to comply with any term or condition of this Consent Order and Agreement shall subject Chambersburg to all penalties and remedies provided by those statutes for failing to comply with an order of the Department.

2. **Findings.**

(a) Chambersburg agrees that the findings in Paragraphs A through G are true and correct and, in any matter or proceeding involving the Chambersburg and the Department, the Chambersburg shall not challenge the accuracy or validity of these findings.

(b) The parties do not authorize any other persons to use the findings in this Consent Order and Agreement in any matter or proceeding.

3. **Comprehensive Inflow and Infiltration Plan.**

Chambersburg shall develop and implement the plan and schedule attached as Exhibit A and may modify the plan in the future with the Department's written approval as more documentation and information becomes available.

4. **Overflows/Additional Pumping.**

(a) Chambersburg shall report all storm related occurrences of backups into buildings or auxiliary facilities related to collection system or treatment works and sanitary sewer overflows (as defined in 25 Pa. Code §94.1) ("overflows") to the Department within 24 hours of the discovery of each occurrence. Chambersburg shall submit written reports of overflows within twenty-four hours of finding the occurrence

(b) In the event of an overflow or back up not caused during an event which is declared by the Governor to be a flood emergency for the area that includes Chambersburg, Chambersburg shall immediately institute, without notice from the Department, a connection prohibition tributary to the area of the bypass, backup, or overflow in accordance with 25 Pa. Code § 94.21. The prohibition shall remain in effect until such time the Department modifies or lifts the prohibition in conjunction with the receipt of an acceptable CAP in accordance with Chapter 94.21.

(c) Upon approval by the Department, Chambersburg shall install the temporary pumping described in Paragraph I. Chambersburg shall submit a written report each time the temporary pumping is used within twenty-four hours following cessation of the pumping. Among other things, the report shall include information about the period of time the temporary pumps were used, the quantity of water pumped and the operation of the plant during the period of that the temporary pumps were utilized. Any additional pumping capacity created by use of the pumps required by this paragraph is a temporary measure and Chambersburg shall terminate the temporary pumping when the treatment plant is upgraded/expanded.

5. **Stipulated Civil Penalties.**

(a) In the event Chambersburg fails to comply in a timely manner with any term or provision of Paragraph 3 above, Chambersburg shall be in violation of this Consent Order and Agreement and, in addition to other applicable remedies, shall pay a civil penalty in the amount of $100 per day for the first thirty (30) days of the violation, and $200 per day each violation extending beyond the first thirty 30 days.

(b) For each overflow where Chambersburg reports pursuant to Section 4(a), Chambersburg shall pay a stipulated penalty of $1000 per overflow per storm event.

(c) For any overflow which occurs but which is not reported to the Department in accordance with Paragraph 4(a), Chambersburg shall pay a civil penalty of $3000 per incident.

(d) For each connection approved or building permit issued after a connection prohibition pursuant to Paragraph 4(b) is instituted or should have been instituted within Chambersburg, a fine of $1,000 per connection or building permit.

(e) Stipulated civil penalties shall be due automatically and without notice, and shall be payable monthly on or before the fifteenth day of each succeeding month, and shall be forwarded as described in Paragraph 9 (Correspondence with Department) below.

(f) Any payment under this paragraph shall neither waive the Chambersburg's duty to meet its obligations under this Consent Order and Agreement nor preclude the Department from commencing an action to compel the Chambersburg compliance with the terms and conditions of this Consent Order and Agreement. The payment resolves only the Chambersburg's liability for civil penalties arising from the violation of this Consent Order and Agreement for which the payment is made.

(g) The Department will not assess stipulated penalties otherwise owed pursuant to Subparagraph 4(b) if the Governor has declared a flood emergency for the area that includes Chambersburg.

6. **Additional Remedies.**

(a) In the event Chambersburg fails to comply with any provision of this Consent Order and Agreement, the Department may, in addition to the remedies prescribed herein, pursue any remedy available for a violation of an order of the Department, including an action to enforce this Consent Order and Agreement.

(b) The remedies provided by this paragraph and Paragraph 5 (Stipulated Civil Penalties) are cumulative and the exercise of one does not preclude the exercise of any other. The failure of the Department to pursue any remedy shall not be deemed to be a waiver of that remedy. The payment of a stipulated civil penalty, however, shall preclude any further assessment of civil penalties for the violation for which the stipulated civil penalty is paid.

7. **Reservation of Rights.** The Department reserves the right to require additional measures to achieve compliance with applicable law. Chambersburg reserves the right to challenge any action which the Department may take to require those measures, except that Chambersburg may not appeal a prohibition instituted pursuant to Paragraph 4.b.

8. **Liability of Chambersburg.** Chambersburg shall be liable for any violations of the Consent Order and Agreement, including those caused by, contributed to, or allowed by its officers, agents, employees, or contractors. Chambersburg also shall be liable for any violation of this Consent Order and Agreement caused by, contributed to, or allowed by its successors and assigns.

9. **Correspondence with Department.** All correspondence with the Department concerning this Consent Order and Agreement shall be addressed to:

Jay Patel
DEP Water Management Program
909 Elmerton Avenue
Harrisburg, PA 17110-8200

10. **Correspondence with Chambersburg.** All correspondence with Chambersburg concerning this Consent Order and Agreement shall be addressed to:

Jeffrey M. Stonehill
Borough Manager
Borough of Chambersburg
100 South Second Street
Chambersburg, PA 17201

Chambersburg shall notify the Department whenever there is a change in the contact person's name, title, or address. Service of any notice or any legal process for any purpose under this Consent Order and Agreement, including its enforcement, may be made by mailing a copy by first class mail to the above addresses.

11. **Force Majeure.**

(a) In the event that Chambersburg is prevented from complying in a timely manner with any time limit imposed in this Consent Order and Agreement solely because of a strike, fire, flood, act of God, or other circumstances beyond the Chambersburg's control and which Chambersburg, by the exercise of all reasonable diligence, is unable to prevent, then Chambersburg may petition the Department for an extension of time An increase in the cost of performing the obligations set forth in this Consent Order and Agreement shall not constitute circumstances beyond Chambersburg's control. Chambersburg's economic inability to comply with any of the obligations of this Consent Order and Agreement shall not be grounds for any extension of time.

(b) Chambersburg shall only be entitled to the benefits of this paragraph if it notifies the Department within five (5) working days by telephone and within ten (10) working days in writing of the date it becomes aware or reasonably should have become aware of the event impeding performance. The written submission shall include all necessary documentation, as well as a notarized affidavit from an authorized individual specifying the reasons for the delay, the expected duration of the delay, and the efforts which have been made and are being made by the Chambersburg to mitigate the effects of the event and to minimize the length of the delay. The initial written submission may be supplemented within 10 working days of its submission. Chambersburg's failure to comply with the requirements of this paragraph specifically and in a timely fashion shall render this paragraph null and of no effect as to the particular incident involved .

(c) The Department will decide whether to grant all or part of the extension requested on the basis of all documentation submitted by Chambersburg and other information available to the Department. In any subsequent litigation, the operator shall have the burden of proving that the Department's refusal to grant the requested extension was an abuse of discretion based upon the information then available to it.

12. **Semi-Annual Meetings.**

(a) Chambersburg and the Department shall meet at least semi-annually, on or about February 1 and August 1, during the term of this Consent Order and Agreement to review the reports required by Paragraph 3, the schedule or work to be completed the following year, the results of ongoing metering and other matters relevant to this Consent Order and Agreement.

(b) Any party may request that additional meetings be held.

13. **Severability.** The paragraphs of this Consent Order and Agreement shall be severable and should any part hereof be declared invalid or unenforceable, the remainder shall continue in full force and effect between the parties.

14. **Entire Agreement.** This Consent Order and Agreement shall constitute the entire integrated agreement of the parties. No prior or contemporaneous communications or prior drafts shall be relevant or admissible for purposes of determining the meaning or extent of any provisions herein in any litigation or any other proceeding.

15. **Attorney Fees.** The parties shall bear their respective attorney fees, expenses and other costs in the prosecution or defense of this matter or any related matters, arising prior to execution of this Consent Order and Agreement.

16. **Modifications.** No changes, additions, modifications, or amendments of this Consent Order and Agreement shall be effective unless they are set out in writing and signed by the parties hereto.

17. **Titles.** A title used at the beginning of any paragraph of this Consent Order and Agreement may be used to aid in the construction of that paragraph, but shall not be treated as controlling.

18. **Decisions under Consent Order.** Any decision which the Department makes under the provisions of this Consent Order and Agreement, including a notice that stipulated civil penalties are due, is intended to be neither a final action under 25 Pa. Code § 1021.2, nor an adjudication under 2 Pa. C.S. § 101. Any objection, which Chambersburg may have to the decision, will be preserved until the Department enforces this Consent Order and Agreement.

19. **2007 COA.** The obligations of the 2007 COA are superseded by this agreement.

20. **Submissions.** So long as it is complete, the Department agrees to review any submission required by this Consent Order and Agreement as soon as is reasonable.

21. **Termination.** The obligations required by Paragraph 3, 4 and 5 of this Consent Order and Agreement shall terminate when the monitoring required by that paragraph has concluded and the Department has approved a revised Act 537 plan.

IN WITNESS WHEREOF, the parties hereto have caused this Consent Order and Agreement to be executed by their duly authorized representatives. The undersigned representatives of Chambersburg certify under penalty of law, as provided by 18 Pa. C.S. §4904, that they are authorized to execute this Consent Order and Agreement on behalf of the Chambersburg; that Chambersburg consents to the entry of this Consent Order and Agreement as a final ORDER of the Department; and that Chambersburg hereby knowingly waives its rights to appeal this Consent Order and Agreement and to challenge its content or validity, which rights may be available under Section 4 of the Environmental Hearing Board Act, the Act of July 13, 1988, P.L. 530, No. 1988-94, 35 P.S. §7514; the Administrative Agency Law, 2 Pa. C.S. §103(a) and Chapters 5A and 7A; or any other provision of law. Signature by Chambersburg's attorney certifies only that the agreement has been signed after consulting with counsel.

FOR CHAMBERSBURG:

Jeffrey M. Stonehill
Borough Manager

FOR THE COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL
PROTECTION:

Lee McDonnell
Program Manager

G. Bryan Salzmann
Attorney for Chambersburg

Martin H. Sokolow, Jr.
Regional Counsel

Chambersburg Borough proposes the following comprehensive 5-year plan to identify and manage Inflow and Infiltration (I&I) of ground or surface water into the sanitary sewer collection system within the Borough of Chambersburg. The goals of the plan are to reduce the potential for hydraulic overload conditions, prevent future hydraulic overload conditions from occurring and ensure capacity for future planned growth and development.

Each of the municipalities' tributary to the Chambersburg collection and conveyance system will be responsible for preparing and following their own I/I plan for each of their collection and conveyance systems.

Chambersburg Borough I/I Strategy

A. Flow Monitoring

1. Chambersburg will monitor both the Collection and Conveyance System, which includes the Conococheague, the West Conococheague and Southern interceptors, and the Chambersburg Collection system.
2. Flow Monitoring: Interceptor System
   a. Interceptor Flows will be monitored utilizing a Flo-Dar flow meter as manufactured by Marsh-McBirney, Inc. Six permanent flow meters will be installed at the major flow connections of the tributary municipalities. The Borough sent a September 28, 2009 letter to the tributary municipalities informing them of the Borough's intent to begin installation of these meters. Three permanent flow meters will be installed on the three major interceptors up stream of the WWTP. Data from the flow meters will be available in increments ranging from 1 minute to 15 minutes. Data will be available via the internet to all interested parties.

- Figure 1 identifies the drainage basins and the locations of the permanent flow meters, municipal flow meters (which are permanent), temporary flow meters and rain gauge locations. Permanent Key Location Meters within Chambersburg's System are depicted on Figure 1 . These Key Location Meters are in addition to the permanent locations that will be installed and the key location meters will provide long term data and will be kept in and maintained for the duration of the Plan. Figure 1 clearly depicts all the meters and their location and the attached table identifies the meters, their location, and the type of meter.
- The flow data will be analyzed; erratic velocity and depth data will be identified, evaluated, and explained. For data gaps greater than four hours, calculated flows or historical data will be used to estimate flows.

   b. The existing WWTP influent flow meter (Flo-Dar manufactured by Marsh-McBirney) will be monitored. Data from the rain gauge will be available in increments ranging from 1 minute to 15 minutes. Data will be available via the internet to all interested parties. A new influent flow meter will be installed at the WWTP when the plant is upgraded and expanded, which will more accurately measure the flows.
   c. Rainfall will be monitored with an automated rain gauge located at the Chambersburg Wastewater Treatment Plant. Data from the rain gauge

will be available in increments ranging from 1 minute to 15 minutes. Data will be available via the internet to all interested parties.

d. Groundwater levels have been monitored utilizing USGS Franklin County Observation Well: 395322077365301 FR 818. Data from this observation well is maintained in one hour increments and is available from USGS on the internet. The Franklin County Observation Well is located 2.35 miles southeast of Chambersburg in Guilford Township. PADEP expressed concern that this well does not adequately react to localized rainfall and requested the Borough to investigate the possibility of finding a local well that could be used for this purpose. Chambersburg will investigate this possibility.

3. Flow Monitoring: Chambersburg Collection System

a. A flow metering program has been used to prioritize sub-basins of the Chambersburg collection system. Subsequent flow metering will be performed in each of the sub-basins starting with the higher priority sub-basins. The flow metering study to date has identified several sub-basins as potentially having excessive I/I. The sub basins with peaking factors greater than 5 are suspect of high levels of inflow and require additional analysis. These include the basins metered by F013, F017 F018 and F021.
- Basin F013 serves the West Commerce and Broad St areas.
- Basin F017 serves portions of the Wilson College and northern residential areas.
- Basin F018 and F021 serve a portion of Wilson College and Northern Chambersburg Borough.
- Basins F004, F014, F015, F016 and F024 serve the south central Chambersburg, including portions of Wayne Ave and East McKinley Street.
The priority ranking will be continuously evaluated and discussed in the bi-annual flow monitoring reports. Meters will remain in sub-basins for multiple metering seasons in order to compile data for multiple events.

b. Flow metering will be performed utilizing area/velocity flow meters purchased by the Borough of Chambersburg. Flow meters are Sigma 910 as manufactured by Hach, and Flow-Totes as manufactured by Marsh McBirney. Data from the flow meters will be available in increments ranging from 1 minute to 15 minutes. The quantity of meters needed to asses a basin will be decided by the size of the basin to be metered, and the layout of the sewer mains.

c. Flow meters will be installed by sub-basin, and will be utilized to direct additional investigations and improvement programs designed to locate and reduce I/I. The flow meters will remain in the basins for multiple metering seasons.

B. Infiltration and Inflow Analysis

Chambersburg Borough will evaluate system wide flows per EDU. Each Sub-basin of the Borough collection system will be individually evaluated. An EDU count for each sub-basin will be performed and a corresponding flow rate will be attributed to the sub-basin.

A flow per EDU will be calculated and compared to the rest of the system. The sub-basins will be ranked by flow per EDU from highest to least. Those with the highest flow per EDU will receive the highest ranking for further investigation. The goal of this evaluation and rehabilitation is to have each sub-basin's flow per EDU to be within 10% of the median flow per EDU for the system.

1.
   a. Chambersburg will perform a detailed analysis of its collection system to determine EDU counts up-stream of each connection to an interceptor.
   b. An allowable flow per EDU will be identified to be used for further prioritizing both system assessment work and system improvements.
   c. Chambersburg will request EDU counts for each inter-municipal flow meter from the tributary municipalities.
   d. Chambersburg will provide EDU counts for each flow meter.
   e. Analyze the storm event at each flow meter in service during the storm event.
2. Quantify and assess all sanitary sewer overflows in the systems.
3. Analyze the magnitude of Inflow/Infiltration by sub-basin.
4. Establish sub-basin priority ranking based on what will be considered excessive.
5. Recommend additional metering and/or investigation.
6. Recommend future improvement projects.

C. Investigative Fieldwork
1. Perform house surveys for sump pump and downspout connections.
2. Televise for specific inflow sources such as inlets and lateral connections.
3. Perform smoke testing.
4. Locate area drains and possible storm sewer cross connections.
5. Inspect night-time wet weather mains, laterals and manholes to determine possible sources of I/I.
6. Establish trigger points and flow thresholds for additional wet weather flow inspections. The current wet weather flow investigation trigger point is plant flows of 15 mgd and rising. This trigger point is based on results from flow meter readings, surcharge indicators, and wet weather visual investigations. The combination of flow meter readings and surcharge indicators has revealed that the conveyance system begins to reach its capacity between 16 and 17 mgd. During wet weather visual investigations, there were no discernable sources of inflow unless the plant was operating at 16 mgd and there was at least an 1 inch of rain over a 6 hour period. Therefore, to allow Crews sufficient time to gear up for wet weather investigations, the trigger points have been established as a WWTP influent flow of 15 mgd and a minimum of 0.75 inches of rain.

D. Wet Weather Analysis and modeling of the Chambersburg Service Areas.
1. The purpose of the wet weather analysis is to identify locations and sub-basins within the study areas that are prone to experiencing wet weather problems, such as system overflows due to high infiltration and inflow and/or inadequate wet weather system conveyance capacity. This information will be used during

development of improvement alternatives so that both dry weather and wet weather capacity (peak flow) needs are met by the recommended alternative.

2. Develop input flow hydrographs for the system hydraulic models using wet weather flow monitoring data and rainfall data. Develop hydrographs to represent rainfall dependent infiltration and inflow (RDI/I) from storm events. RDI/I hydrographs will be developed using a unit hydrograph approach that is calibrated to actual flow monitoring data from the study area. The unit hydrograph technique will then be used to predict RDI/I hydrographs for the storm events.
3. Combine each of the RDI/I hydrographs for the storm events with one dry weather flow condition and route through the hydraulic models of the sewer systems. Identify predicted system deficiencies during wet weather flow conditions, such as hydraulic restrictions, surcharging, and/or overflows.
4. Develop hydrographs to simulate RDI/I reductions for two sewer rehabilitation scenarios. This evaluation will be used to identify potential combinations of sewer rehabilitation and facility improvements that may be more cost effective than facility improvements or sewer rehabilitation alone in some areas.
5. Select a design storm to use for modeling and prediction of the RDI/I hydrograph for the design storm condition. Using available wet weather flow data, perform I/I hydrograph parameter analyses using a computer model. (Confirm the design storm with DEP.)
6. Using the computer model and design parameters derived from historical flow data; predict the peak RDI/I hydrograph shapes and values of peak RDI/I for the design storm.
7. Input the above hydrographs into the computer models along with the data on pipe segment diameters and slopes to identify capacity problems, where surcharging will occur, and location of predicted sewer system overflows and volumes of overflow from the design storm.
8. Using the available sewer system evaluation data, perform an I/I analysis and cost effective analysis for rehabilitation to determine the role rehabilitation will play in addressing the hydraulic limitations and elimination of overflows.

E. Complete Act 537 Planning for the conveyance system. This would include; summarization and results from inspections, metering, modeling, wet weather modeling, future growth and land development, future flow analysis and alternative analysis for conveyance system improvements and upgrades.

F. Prepare a semi-annual I/I progress report. The report will discuss the status of the I/I plan implementation, flow monitoring results, results of any investigative fieldwork performed and updates to the schedule. The report will include recommended adjustments to approved work plan including but not limited to metering locations, metering effort, field observation, sub-basin and mini-basin recommended monitoring and rehabilitation work.

1. Submit the semi-annual progress reports on February 1 and August 1 of each calendar year.
2. Include a listing of any overflows which identifies the location, the date of the overflow, estimated duration of the overflow, estimated quantity of overflow,

remedial action taken at the time of the overflow, and actions taken to prevent future overflows at the location.

3. Identify the location and extents of known surcharges.
4. Prepare a flow meter report
   a. Provide raw flow meter data for each meter in the Chambersburg collection and conveyance system. Raw meter data will be provided on an hourly interval.
   b. Summarize the flow meter data from reporting period. Include: average daily flow (mgd), level (in) and velocity (fps) in a line hydrographs and a scatter graphs.
   c. Prepare storm flow reports for all storms over 0.75 inches of rain over a 6 hour period. As additional data is compiled, continually analyze the rationale for the trigger and provide the rationale in subsequent reports. Provide average flows on an hourly interval from storm events identify pre-storm and post-storm conditions. Include: average daily flow (mgd), level (in) and velocity (fps) in a line hydrographs and a scatter graphs.
   d. Identify any flow metering problems, and provide raw data not manipulated data for all data submissions. If there are problems with the data explain why and discuss remedy to problem
5. Report the information contained in section D. paragraph 2. for storm events of 0.75 inches or greater. This requirement may be adjusted as more flow data is obtained and as a greater understanding of how the system reacts to rainfall under various groundwater and soil saturation conditions progresses.
6. Identify future sewer replacement and/or improvement projects identified.

SCHEDULE

The following schedule has been developed to guide continued efforts to reduce I/I and improve the Chambersburg conveyance system. As this collection system monitoring and characterization continues, it will most likely be modified based on on-going planning efforts and any unknown issues discovered during this process.

A. Flow Monitoring	
Permanent Township Flow Meter Installation	August 31, 2010
Investigate Alternative Groundwater Monitoring Well	July 31, 2010
Install Groundwater Monitoring Equipment	August 31, 2010
Concentrate Meters in Wilson College Area (Priority 1 & 2 Areas as shown on Exhibit 2.1 Priority Basin Map)	April 30, 2010
Concentrate Meters in the McKinley St. Area (Priority 1 & 2 Areas as shown on Exhibit 2.1 Priority Basin Map)	February 28, 2011
B. Infiltration and Inflow Analysis	
Establish a Baseline Flow per EDU	June 1, 2010

Identify a Trigger to initiate Field Investigations	Junel, 2010
C. Investigative Field Work	
Televise Wilson College Area	October 31, 2010
Televise McKinley St. Area	June 30, 2011
D. Wet Weather Analysis & Modeling	
Develop a Baseline Computer Model of Interceptors	June 1, 2010
Develop Input Flow Hydrographs	June 1, 2010
E. Complete Act 537 Planning for Conveyance	August 30, 2011
F. Semi-Annual Progress Report	February 1st – August 1st
G. Televise Collection System[1]	August 2010 – August 2015
H. Sump Pump / Wet Weather Inspections[2]	August 2010 – August 2015

[1]The collection system flows will be metered, and approximately half the system will be televised. The first half will be based on priority ranking from the flow analysis. Based on the flow metering and CCTV analysis smoke testing and dye testing will be included. Specific schedules for these additional tasks are not yet known. Wet weather inspections will be utilized to enhance the flow metering results to further locate significant sources of I/I and will be performed as indicated based on rain fall and system flows.

[2]Sump pump / wet weather inspections will be performed basin by basin, based on priority. The initial priority will be the Wilson College area and portions of northern Chambersburg that have exhibited high I/I flow rates.

Chambersburg
Flow Metering Locations

Meter	Location	Type
M001	Immediately Downstream of the Wayne Avenue Meter	Past Temporary Meter
M002	Immediately Downstream of the Walker Road Meter	Past Temporary Meter
M003	Immediately Downstream of the Washington Street Meter	Past Temporary Meter
M004	Immediately Downstream of the Commerce Street Meter	Past Temporary Meter
M005	Immediately Downstream of the Penn Hall Meter	Past Temporary Meter
P001	South Interceptor Meter, just upstream of WWTP	Permanent Meter
P002	W Conococheague Interceptor Meter, just upstream of WWTP	Permanent Meter
P003	E Conococheague Interceptor Meter, just upstream of WWTP	Permanent Meter
WWTP	Influent at Wastewater Treatment Plant	Permanent Meter
F003	South Interceptor near Maryland Avenue	Temporary Meter - Past
F004	Garfield St Interceptor	Permanent Key Location Meter
F007	W Conococheague Interceptor along stream just downstream of King St.	Temporary Meter - Past
F008	E Conococheague Interceptor along stream just downstream of King St.	Temporary Meter - Past
F009	Falling Springs interceptor on King St.	Permanent Key Location Meter
F011	W Conococheague Interceptor downstream of Commerce St Interceptor	Permanent Key Location Meter
F012	W Conococheague Interceptor downstream of siphon near Vine St	Temporary Meter - Past
F013	Vine street sub-basin near W Conococheague Interceptor	Temporary Meter - Current
F014	Garfield St Interceptor near Black Ave	Temporary Meter - Current
F015	Garfield St Interceptor near Black Ave	Temporary Meter - Current
F016	Garfield St Interceptor near Fourth	Temporary Meter - Current
F017	College Ave sub-basin near W Conococheague Interceptor	Temporary Meter - Current
F018	Philadelphia Ave sub-basins near W Conococheague Interceptor	Temporary Meter - Current
F019	Penn Hall sub-basin near W Conococheague Interceptor	Temporary Meter - Current
F020	Upstream of Philadelphia Ave sub-basin near W Conococheague Interceptor	Temporary Meter - Current
F021	Pennsylvania Ave sub-basin near W Conococheague Interceptor	Temporary Meter - Current
F022	College Ave and Morrow Place	Temporary Meter - Current
F023	East Vine St and Philadelphia Ave	Temporary Meter - Current
F024	East McKinley St and Stanley Ct	Temporary Meter - Current
Wayne Avenue	Guilford Township Meter located at Wayne Avenue and the Borough Boundary	Municipal
Walker Road	Guilford Township Meter located at Walker Avenue and the Borough Boundary	Municipal
Washington Street	Hamilton Township Meter located at Washington St. near the Nitterhouse Park entrance	Municipal
Loudon Street	Hamilton Township Meter located between soccer fields in Nitterhouse Park	Municipal
Commerce Street	Hamilton Township Meter located at Commerce St. and the Borough Boundary	Municipal
Penn Hall	Greene Township Meter located near Wilson College and the Borough Boundary	Municipal

FIGURE 1

CHAMBERSBURG SEWER SYSTEM MAP

FRANKLIN COUNTY, PENNSYLVANIA