

WASTEWATER MANAGEMENT PLAN  
FOR  
HIGH BRIDGE BOROUGH  
HUNTERDON COUNTY, NEW JERSEY

MAY 23, 2005

STUDER AND McELDOWNEY, P.A.  
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CLINTON, NEW JERSEY 08809

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## Introduction

The purpose of this report is to provide a comprehensive analysis of sewage usage for the Borough of High Bridge. The Borough of High Bridge has agreements with the Town of Clinton to treat its sewage. High Bridge Borough also has agreements for sewage from Voorhees High School, Spruce Run Recreation Area, and Voorhees State Park to pass through the Borough collection system and pumped from the Borough pumping station to the Town of Clinton.

This Wastewater Management Plan contains an analysis of the current and projected sewer service area population and wastewater flows and conclusion as to potential available sewage capacity.

In preparing this report I have accessed the firm's files, which date back to 1972, have obtained flow data from Clinton and the Borough regarding Voorhees High School, and have spoken with the Town's engineer, Robert Clerico, P.E., and administrator, Robert Cutter.

I have examined the following documents:

1. *Wastewater Management Plan for Town of Clinton*, VanCleeef Engineering Associates, June 20, 2002
2. Agreement between The State of New Jersey, Department of Environmental Protection and the New Jersey Water Supply Authority, November 23, 1994
3. Agreement between the State of New Jersey and the Borough of High Bridge, October 4, 1983
4. Draft *Wastewater Management Issues*, Killam Associates, October 18, 2001
5. Agreement Between the Town of Clinton and Borough of High Bridge, February 7, 1974
6. Agreement between North Hunterdon Regional High School District and Borough of High Bridge, December 3, 1973
7. Agreement between the State of New Jersey and the Borough of High Bridge, June 1, 1970

## Existing Conditions

### ***Sewer Service Areas***

The sewer service area covers most of the Borough of High Bridge, including commercial and residential connections. The Borough also has force main connections from Voorhees High School and Spruce Run Recreation Area. Attached is Figure 1 – *Existing Wastewater Treatment Service Areas*, developed from the Borough tax map and from *Wastewater Management Plan for Town of Clinton* prepared by Van Cleef Engineering Associates.

## ***Service Area Population***

Based on the data from the 2000 census obtained from the Hunterdon County Planning Board, there were 3,776 people living in High Bridge Borough. Sanitary sewage is mostly generated from residential uses within the Borough, although some flow is generated by commercial and industrial users.

## ***Wastewater Flows***

The Borough of High Bridge has a contracted amount of sewage flow that can be sent to the Town of Clinton's Wastewater Treatment Plant. The original agreement between the Borough of High Bridge and the Town of Clinton is dated September 10<sup>th</sup> 1968 and was for 260,000 gallons of daily treatment capacity. The Borough's capacity was increased by 24,000 gallons per day (gpd) with the School Agreement dated December 3, 1973. A third agreement dated February 7, 1974 further increased the Borough's capacity by another 88,000 gpd, making the total daily reserved treatment capacity 372,000 gallons per gpd. It is stated on Page 17 of the 1974 agreement that if the Plant is re-rated the Borough will receive an additional flow as a result of this re-rating. The Department of Environmental Protection did re-rate the Plant from 2 million gpd to 2,030,000 gpd. That additional 30,000 gpd was assigned to the Borough for the Dewey Heights West (Hilltop) residential development.

The total amount the Borough may pump to the wastewater treatment plant is 402,000 gpd. However 24,000 gpd are for the sole use of the North Hunterdon Regional High School District as stated in the December 3, 1973 agreement between the Borough and School District. High Bridge can only use 378,000 gpd for its user area. Table – 1 *Contract Users* includes a breakdown of how the Borough acquired the 402,000 gpd and shows the different contract users that pass through the Borough and are included in the 402,000 gpd total.

The contract users that pass through the Borough are Spruce Run Recreational Facility and Voorhees State Park. The 1983 agreement between Borough of High Bridge and the State of New Jersey allocates 8,220 gpd to be reserved for the potential development of Voorhees State Park, 31,500 gpd to be reserved for the sewered area of Spruce Run Reservoir. An additional agreement in 1994 between the State of New Jersey and the New Jersey Water Supply Authority authorizes The Water Supply Authority 3,500 gpd of Spruce Run's reserve capacity. Per NJDEP's Division of Parks and Forestry a memorandum dated December 7, 1998 stated that the Voorhees Residential Group Center would be allowed to use the reserve capacity for Voorhees State Park.

We have received meter readings for Voorhees High School and the Spruce Run Recreational Area. Voorhees State Park does not send any sewer though High Bridge's system.

Monthly precipitation recorded at the National Oceanic and Atmospheric Administration's station in Long Valley, New Jersey was compared to the monthly

gallons treated at the wastewater treatment plant. There exists a correlation between higher rainfall events and higher monthly flows leading us to believe that infiltration/inflow into the system contributes to total flows (Figure 2). However, the contribution is not of sufficient magnitude to suggest that there is a problem of excessive infiltration/inflow that would warrant corrective measures at this time.

Chapter 14A of the New Jersey Administrative Code includes regulations governing the discharge of pollutants to surface and ground waters of the State. Included are rules covering the New Jersey Pollutant Discharge Elimination System (NJDPES) permit program and the Treatment Works Approval (TWA) program. A TWA is required for sewer extensions conveying 8,000 gpd or more or connections which will increase the projected flow of an existing sewer by 8,000 gpd. (7:14A-22.3).

In 7:14A-1.2 “Actual flow” is defined as *the volume of sewage and other wastes which a treatment works receives. Actual flow shall be determined by the arithmetic average of the metered daily volumes of waste received at a treatment works for the preceding period of three consecutive calendar months. Where peak flows have been determined by the Department to be seasonal in nature, the seasonal peak flow period shall be used in determining actual flow.*

“Committed flow” is defined as *the sum of the actual flow plus the sum of all flows which are anticipated from connections which have been approved but are not yet in operation. The flow to be anticipated from any such connections shall be that flow approved by the Department.* The “committed flow” would be what has been approved for Voorhees State Park and Spruce Run Recreational Facility.

Table 2-*Existing Usage* shows the peak three month rolling average for each year based on the Borough pumping records.

Table 5 – *Wastewater Treatment Plant Flows* includes actual sewage usage metered monthly, average daily flows, and the three-month rolling average, for years 2001-2004. From January 2001 to December 2004, the peak three-month rolling average occurred during December 2003 and January and February of 2004 and is 396,744 gpd.

The flow data indicates an unusually high flow during December 2003, affecting the peak three-month rolling average for both 2003 and 2004. We understand that this resulted from a non-recurring incident of inflow into the system. Table 5a takes out the recorded flow and instead includes a December 2003 flow based on the average percentage increase from November to December for years 2001, 2002 and 2004 in order to be more reflective of actual conditions. With the modified December 2003 data point the peak three-month rolling average occurred during April, May, and June of 2003 and is 388,132 gpd.

Table 3 – *Summary of Usage* includes the break down of the peak three-month rolling average, additional committed flows, the total committed flow and what the Borough has remaining in unused capacity. Table 3a – *Summary of Usage with modified December 2003 flow* shows the breakdown of what the Borough has remaining in

unused capacity based on Table 5a. This table shows the Borough's committed flows are exceeding the Borough's contracted amount of 378,000 gpd.

The flows that are included in the peak three-month rolling average are based on actual measurements taken from the wastewater treatment plant and include Voorhees High School's flows. Tables 3, 3a and 3b exclude the school's flows to determine the Borough's remaining unused sewage flow. The tables added in the total allocated amount for Voorhees State Park and Spruce Run Recreational Facility and subtracts out what they put into the system now.

The contracts the Borough has with the Town of Clinton do not reflect the requirements or definitions of 7:14A, which was adopted after the agreements were entered into. The agreements provide for the Town's accepting "up to" a specified number of "gallons of sewage per day, based on an average daily (24 hour) design flow." Table 3b includes the average daily flow, additional committed flow, the total committed flow and what the Borough has remaining in unused capacity for years 2001-2004. This table shows the Borough's committed flows fell below the Borough's contracted amount of 378,000 gpd in 2001, 2002 and in 2004 by 32,426 gpd.

## **Proposed Conditions**

The 20 year projected conditions should assume that all allocated sewage is being used by the contracted parties. If this were the case, then no new development besides an already contracted user would be permitted to send flows to the Town's wastewater treatment facility.

For potential development of the residential, commercial downtown business, open space and research/office/manufacturing zones, flows for future ultimate buildout were estimated. *The Land Use and Ordinance of the Borough of High Bridge 2004* was used to determine maximum commercial floor area ratios and residential units. The borough National Geomatica website was used to determine all undeveloped property within the Borough.

Properties within the Borough that can be developed result in an estimated additional 300 homes. Many existing homes are on septic systems but within the sewer service area. It is assumed that in the future 100 of these homes may have failing septic systems and require connecting to the sewer system. Future development could total as many as 400 new homes connecting to the system, which would produce a flow of 120,000 gpd.

There are approximately 7 acres of undeveloped land within the commercial zone. Based on a 35 percent maximum floor area ratio, approximately 109,500 sf of building floor area could be developed. The NJDEP projected flow criteria of 0.10 gpd per square foot of building area projects an additional 10,950 gpd.

The research/office/manufacturing zone has 2 lots that potentially could be developed. 46,800 sf of building area could be constructed on these lots, which

would result in an additional 4,680 gpd. The NJDEP projected flow criteria of 0.10 gpd per square foot was utilized for this zone as well.

The Downtown Business Zone has approximately 3 acres of undeveloped land. Using a maximum floor area ratio of 50 percent, 62,720 sf of building could be constructed in this zone. The NJDEP projected flow of 0.10 gpd per square foot was utilized for this zone, which results in a total flow from the downtown business zone of 6,272 gpd

Public buildings of a governmental or cultural nature may be constructed on the Permanently Dedicated Open Space. Since no building requirements are given and the Mayor and Common Council will determine the requirements on a case by case basis, a 0.05 % maximum floor area ratio was used with the NJDEP projected flow of 0.10 gpd per square foot. A potential 9,000 gpd could be generated from the 411 acres of the open space 411 acres.

The ultimate build out for the Borough based on modified “actual flow” and the above-mentioned future flows results in an average daily flow of approximately 534,746 gpd. Table 4 below shows the break down.

Table 4 Existing and Future Average Daily Flows

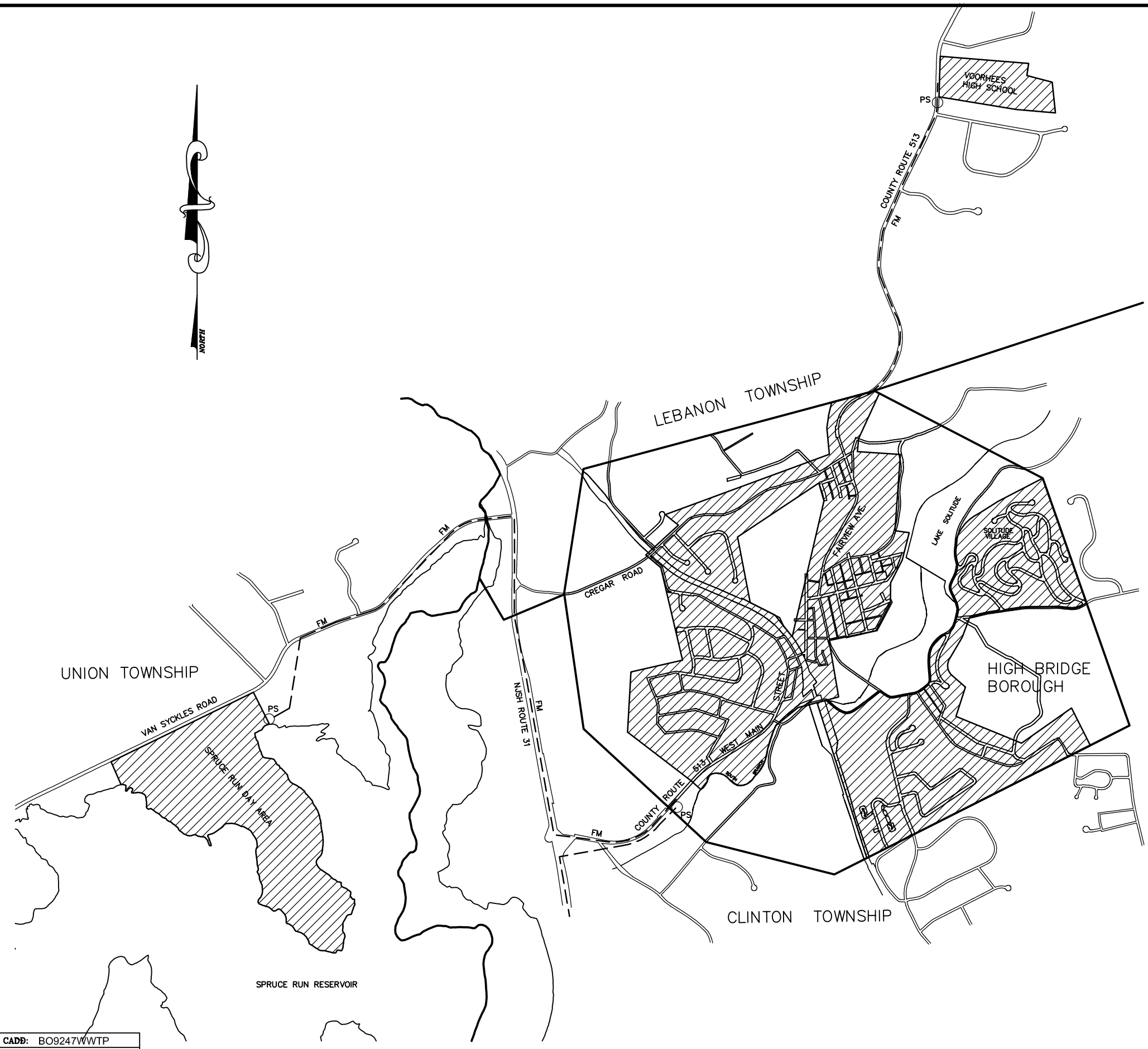
	Using “Actual Flow”	Using 2004 Ave.
Existing Flow	388,132 gpd	320,512 gpd
Future Residential (approx 387 homes)	120,000 gpd	120,000 gpd
Commercial Zone	10,950 gpd	10,950 gpd
Redevelopment of ROM Zone	4,680 gpd	4,680 gpd
Redevelopment of Downtown Business Zone	6,272 gpd	6,272 gpd
Permanently Dedicated Open Space	<u>9,000 gpd</u>	<u>9,000 gpd</u>
Total Future Flow	539,034 gpd	471,414 gpd

## Summary/Recommended Plan

Current and projected usage within High Bridge Borough, including the amount allocated for future development, meets or exceeds the contract treatment plant allocation with the Town of Clinton based on the average “committed flow”. The adjusted average daily flow of 332,232 gpd from 2001 to 2004 and 364,050 gpd over the past two years compares with the total contractual allocation of 378,000 gpd and indicates that based on average daily flow there are approximately 13,951 gpd available. This report illustrates that there is limited sewer capacity and insufficient sewer allocation available for the ultimate build-out for the Borough. Future developments should be limited to those properties which have soils and property configuration conducive to on-site sewage disposal systems

The Borough Council should review its policy regarding prioritization of sewage allocation. Sewer access should be limited to the health and safety of the borough, affordable housing commitments and the Borough's financial stability. Homeowners having failing septic systems and who do not have acceptable site conditions for replacing their disposal fields should be given priority for limited access to the sewer system. The Borough will not be able to meet affordable housing needs and be in compliance with State mandated affordable housing laws unless it prioritizes capacity for affordable housing. Consideration should be given to reserving capacity for commercial uses so as to help maintain the ratable tax base.

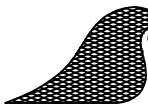
L:\MUNICIPAL\HBB\B09247 WWTP\dwg\WW TREATMENT FACILITIES.dwg, 3/1/2005 3:04:01 PM



SOURCE:  
"WASTEWATER MANAGEMENT PLAN FOR TOWN OF CLINTON,"  
PREPARED BY VAN CLEEF ENGINEERING ASSOCIATES, LAST  
DATED JUNE 20, 2002.

 EXISTING SERVICE AREA

CADD:	B09247WWTP
PROJECT NO.:	B09247
FILE:	HBB WWPT
GEOG. LOC.:	
BOOK:	
PAGE:	



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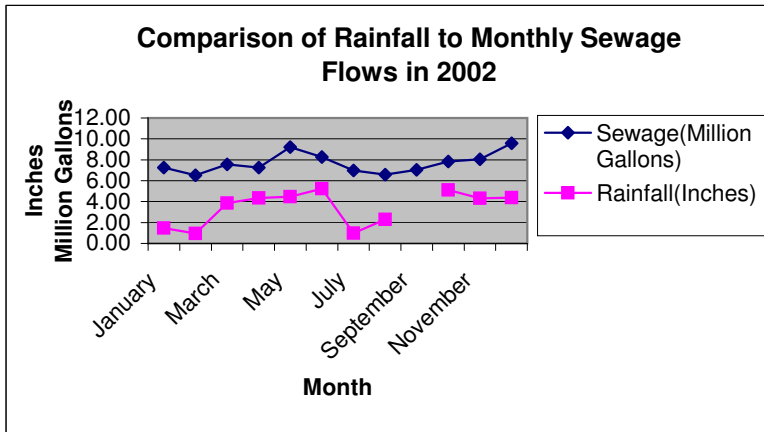
**FIGURE 1 - EXISTING WASTEWATER TREATMENT SERVICE AREAS FOR HIGH BRIDGE BOROUGH**  
TOWN OF CLINTON  
HUNTERDON COUNTY, NEW JERSEY

DRAWN BY: SLY  
CHECKED BY: DMB  
DATE: FEB. 2004  
SCALE: 1"= 2000'

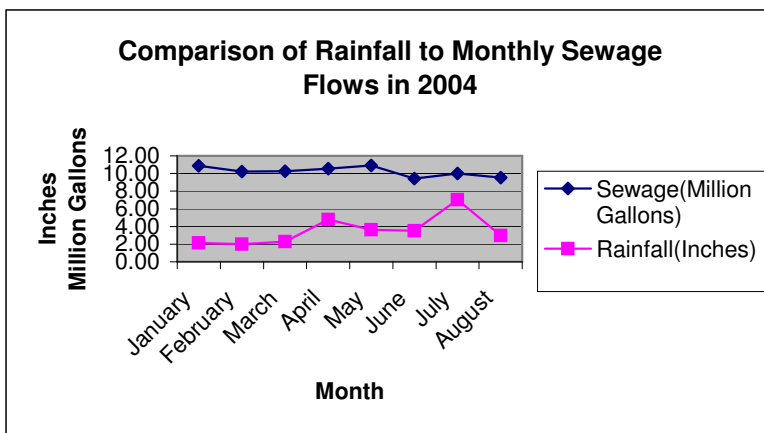
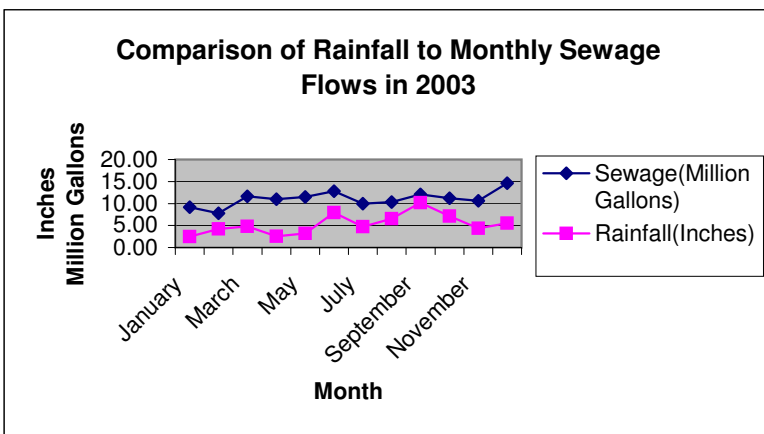
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SHEET NO. OF  
DRAWING NO.:  
**2720-A**

Figure 2 - Rainfall Sewage Flows Charts



Data element missing for September 2002. There was no precipitation measured during the month.



## Table 1- Contract Users

High Bridge Borough and Town of Clinton		402,000 gpd
Original Contract, 1968	260,000 gpd	
Additional Contract, 1974	88,000 gpd	
Re-rating of plant (Dewey Heights West), 1974	30,000 gpd	
School Contract, 1973	24,000 gpd	
North Hunterdon Regional High School District and High Bridge Borough for school only, 1973		24,000 gpd
Spruce Run Recreational Facility and High Bridge Borough		31,500 gpd
NJWSA Administration Building, 1994	3,500 gpd	
Voorhees State Park and High Bridge Borough		8,220 gpd
Residential Group Center, 1998	8,220 gpd	

Table 2 – Existing Usage

Year	Peak 3-month rolling Average shown in Gallons per day
2001	326,663 gpd
2002	276,826 gpd
2003	395,424 gpd
2004	396,744 gpd

Source Clinton Wastewater Treatment Plant flow readings

Table 3 - Summary of Usage

Year	Peak 3-month rolling Avg gpd	Voorhees State Park and Spruce Run Recreational Facility	Spruce Run Recreational Facility Peak 3-month rolling avg gpd (2)	Voorhees School Peak 3-month rolling avg gpd (1)	Total Committed Flow	Borough Remaining Unused Sewage from 378,000 gpd
2001	326,663	39,720	-12,365	-9,396	344,622	33,378
2002	276,826	39,720	-12,809	-9,504	294,233	83,767
2003	395,424	39,720	-14,296	-9,906	410,942	-32,942
2004	396,744	39,720	-18,852	-8,611	409,001	-31,001

(1) Source Voorhees High School monthly gallonage report from High Bridge (2001, 2002, 2003, 2004)

(2) Source Spruce Run Recreational Facility monthly gallonage report from Spruce Run (2001, 2002, 2003, 2004)

Table 3a - Summary of Usage with modified Dec. 2003 flow.

Year	Peak 3-month rolling Avg gpd	Voorhees State Park and Spruce Run Day Use Facility	Spruce Run Recreational Facility Peak 3-month rolling avg gpd (2)	Voorhees School Peak 3-month rolling avg gpd (1)	Total Committed Flow	Borough Remaining Unused Sewage from 378,000 gpd
2001	326,663	39,720	-12,365	-9,396	344,622	33,378
2002	276,826	39,720	-12,809	-9,504	294,233	83,767
2003	388,132	39,720	-14,296	-9,906	403,650	-25,650
2004	370,855	39,720	-18,852	-8,611	383,112	-5,112

(1) Source Voorhees High School monthly gallonage report from High Bridge (2001, 2002, 2003, 2004)

(2) Source Spruce Run Recreational Facility monthly gallonage report from Spruce Run (2001, 2002, 2003, 2004)

Table 3b - Summary of Usage using Avg gpd and modified Dec. 2003 flow

Year	Avg. gpd for year	Voorhees State Park and Spruce Run Day Use Facility	Spruce Run Recreational Facility avg. gpd for year (2)	Voorhees School avg. gpd for year (1)	Total Committed Flow	Borough Remaining Unused Sewage from 378,000 gpd
2001	294,846	39,720	-4,819	-8,212	321,535	56,465
2002	252,261	39,720	-4,838	-7,848	279,295	98,705
2003	356,733	39,720	-6,065	-7,863	382,525	-4,525
2004	320,512	39,720	-7,837	-6,821	345,574	32,426

(1) Source Voorhees High School monthly gallonage report from High Bridge (2001, 2002, 2003, 2004)

(2) Source Spruce Run Recreational Facility monthly gallonage report from Spruce Run (2001, 2002, 2003, 2004)

Table 5 - Wastewater Treatment Plant Flows

	Month	Avg.Gal/day	Actual sewage usage (gal)	days/month	3-month Rolling avg
2001	January	281,290	8,720,000	31	
	February	322,643	9,034,000	28	
	March	334,968	10,384,000	31	312,644
	April	321,833	9,655,000	30	<b>326,663</b>
	May	284,871	8,831,000	31	313,804
	June	295,533	8,866,000	30	300,571
	July	272,000	8,432,000	31	284,011
	August	299,871	9,296,000	31	289,065
	September	332,233	9,967,000	30	301,033
	October	298,355	9,249,000	31	309,913
	November	236,200	7,086,000	30	289,033
	December	258,355	8,009,000	31	264,609
Avg per year		<b>294,846</b>			
2002	January	234,032	7,255,000	31	242,935
	February	233,036	6,525,000	28	242,100
	March	243,548	7,550,000	31	237,000
	April	241,833	7,255,000	30	239,663
	May	297,323	9,217,000	31	261,109
	June	275,433	8,263,000	30	271,813
	July	225,452	6,989,000	31	265,967
	August	211,839	6,567,000	31	237,163
	September	234,433	7,033,000	30	223,793
	October	252,516	7,828,000	31	232,913
	November	268,267	8,048,000	30	251,747
	December	309,419	9,592,000	31	<b>276,826</b>
Avg per year		<b>252,261</b>			
2003	January	295,581	9,163,000	31	291,337
	February	278,714	7,804,000	28	295,100
	March	374,903	11,622,000	31	317,656
	April	366,733	11,002,000	30	341,888
	May	370,806	11,495,000	31	370,859
	June	427,433	12,823,000	30	388,132
	July	321,645	9,971,000	31	372,707
	August	333,903	10,351,000	31	360,272
	September	401,300	12,039,000	30	351,750
	October	360,129	11,164,000	31	364,717
	November	354,267	10,628,000	30	371,769
	December	470,548	14,587,000	31	<b>395,424</b>
Avg per year		<b>362,997</b>			
2004	January	351,355	10,892,000	31	392,467
	February	352,690	10,228,000	28	<b>396,744</b>
	March	331,419	10,274,000	31	348,822
	April	352,100	10,563,000	30	349,045
	May	352,129	10,916,000	31	345,141
	June	314,733	9,442,000	30	339,791
	July	322,419	9,995,000	31	329,924
	August	307,258	9,525,000	31	314,804
	September	325,833	9,775,000	30	318,424
	October	266,129	8,250,000	31	299,457
	November	271,333	8,140,000	30	287,527
	December	298,742	9,261,000	31	278,815
Avg per year		<b>320,512</b>			

Table 5a - Wastewater Treatment Plant Flows with modified Dec. 2003 flow

	Month	Avg. Gal/day	Actual sewage usage (gal)	days/month	3-month Rolling avg
2001	January	281,290	8,720,000	31	
	February	322,643	9,034,000	28	
	March	334,968	10,384,000	31	312,644
	April	321,833	9,655,000	30	<b>326,663</b>
	May	284,871	8,831,000	31	313,804
	June	295,533	8,866,000	30	300,571
	July	272,000	8,432,000	31	284,011
	August	299,871	9,296,000	31	289,065
	September	332,233	9,967,000	30	301,033
	October	298,355	9,249,000	31	309,913
	November	236,200	7,086,000	30	289,033
	December	258,355	8,009,000	31	264,609
Avg per year		<b>294,846</b>			
2002	January	234,032	7,255,000	31	242,935
	February	233,036	6,525,000	28	242,100
	March	243,548	7,550,000	31	237,000
	April	241,833	7,255,000	30	239,663
	May	297,323	9,217,000	31	261,109
	June	275,433	8,263,000	30	271,813
	July	225,452	6,989,000	31	265,967
	August	211,839	6,567,000	31	237,163
	September	234,433	7,033,000	30	223,793
	October	252,516	7,828,000	31	232,913
	November	268,267	8,048,000	30	251,747
	December	309,419	9,592,000	31	<b>276,826</b>
Avg per year		<b>252,261</b>			
2003	January	295,581	9,163,000	31	291,337
	February	278,714	7,804,000	28	295,100
	March	374,903	11,622,000	31	317,656
	April	366,733	11,002,000	30	341,888
	May	370,806	11,495,000	31	370,859
	June	427,433	12,823,000	30	<b>388,132</b>
	July	321,645	9,971,000	31	372,707
	August	333,903	10,351,000	31	360,272
	September	401,300	12,039,000	30	351,750
	October	360,129	11,164,000	31	364,717
	November	354,267	10,628,000	30	371,769
	December	395,387	12,256,992 *	31	370,098
Avg per year		<b>356,733</b>			
2004	January	351,355	10,892,000	31	367,141
	February	352,690	10,228,000	28	<b>370,855</b>
	March	331,419	10,274,000	31	348,822
	April	352,100	10,563,000	30	349,045
	May	352,129	10,916,000	31	345,141
	June	314,733	9,442,000	30	339,791
	July	322,419	9,995,000	31	329,924
	August	307,258	9,525,000	31	314,804
	September	325,833	9,775,000	30	318,424
	October	266,129	8,250,000	31	299,457
	November	271,333	8,140,000	30	287,527
	December	298,742	9,261,000	31	278,815
Avg per year		<b>320,512</b>			
Avg monthly		<b>306,088</b>			

\* December 2003 flow changed to have a more accurate flow that is not skewed by a non-recurring incident of inflow. New number calculated from the average percent increase from Nov. to Dec. for the other three years.

Table 6 - Yearly Usage

Year	Actual Yearly Usage (gal)	Allocated yearly usage (gal)
2002	92,122,000	137,970,000
2003	132,649,000	137,970,000
2004	117,261,000	137,970,000