

## **Section 2: Water Quality Problem Areas**

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### **2.0 INTRODUCTION**

Existing data sources were used to identify and classify potential water quality problem areas in the Town of Southeast. Data and interpretation were sought from sources identified in Putnam County's Phase I Planning Analysis and Resource Manual, and from New York City Department of Environmental Protection (NYCDEP), Putnam County Department of Health, and New York State Department of Environmental Conservation (NYSDEC). These data were used to identify water quality problem areas, water quality trends, and sources of contamination.

### **2.1 WATER QUALITY PROBLEM AREAS**

#### **2.1.1 POLLUTANTS OF CONCERN**

The pollutants of concern within the New York City watershed include phosphorus, coliform, and total suspended solids.

##### *PHOSPHORUS*

Phosphorus is essential for the growth of algae and other biological organisms. In reservoirs and lakes, phosphorus is usually the limiting nutrient. High phosphorus levels can lead to noxious algal blooms and low dissolved oxygen levels. These conditions affect the trophic state of water bodies and worsening conditions are detrimental to aquatic life and water quality and can lead to drinking water problems such as taste and odor that could require expensive treatment techniques to be implemented to meet drinking water quality standards. There is also a link between the amount of phosphorus and the amount of organic carbon in a water body. Chlorination of organic carbon compounds has been shown to create disinfection by-products that are of concern. The USEPA has proposed rules to control the amount of disinfectants and disinfection by-products in drinking water.

NYCDEP is developing a Total Maximum Daily Load (TMDL) for phosphorus in each watershed to determine phosphorus loading capacities and to control water quality in the reservoirs. Section 303(d) of the Clean Water Act (CWA) requires states to identify the water bodies in the state which, after application of the technology-based effluent limitations required by the CWA, do not meet water quality standards. These water bodies are identified as water quality-limited. NYSDEC is required under the CWA to develop and implement TMDLs for waterbodies listed on the State's 303(d) list. NYSDEC has identified the NYCDEP reservoirs as priority waters for TMDL development. The CWA requires the states to establish, and the USEPA to approve, TMDLs that, upon implementation, will achieve water quality standards. TMDLs account for point and non-point loads. NYCDEP agreed to assist the State in developing phosphorus TMDLs for the New York City watershed and to provide technical support that primarily consists of phosphorus modeling, data analysis, and preliminary TMDL calculations. NYCDEP completed the Phase I phosphorus TMDL calculations in June 1996. The Phase I

TMDLs are based on achieving a growing season average phosphorus concentration (guidance value) of 20 µg/l (micrograms/liter).

NYCDEP released technical reports on phosphorus levels in reservoirs in March 1999. NYCDEP does not believe the 20 µg/l phosphorus guidance value is stringent enough to protect the water supply. As a result, the Phase II TMDLs for source water reservoirs were calculated using a 15 µg/l guidance value. The official TMDLs were approved by the USEPA in October 2000.

### *COLIFORM*

Pathogenic organisms found in wastewater may be discharged by human beings who are infected with disease or who are carriers of a particular disease. Because the numbers of pathogenic organisms present in wastes and polluted waters are few and difficult to isolate and identify, the coliform organism, which is more numerous and more easily tested for, is commonly used as an indicator organism. Each person discharges from 100 to 400 billion coliform organisms per day. Thus, the presence of fecal coliform organisms is taken as an indication that pathogenic organisms may also be present.

For drinking water supplies, the Total Coliform Rule was enacted on June 29, 1989. Total coliforms include both fecal coliforms and E-coli. The Maximum Contaminant Level Goal (MCLG) for total coliforms has been set at zero (0). The MCLG for systems analyzing at least 40 samples per month is to have no more than five percent of the monthly samples test positive for total coliform. For systems analyzing less than 40 samples per month, no more than one sample per month may test positive for total coliform. Compliance with the MCLG is based on the presence or absence of total coliforms in a sample. Requirements for monthly monitoring are based on the population served by the water supply system.

### *TOTAL SUSPENDED SOLIDS*

Suspended and colloidal matter such as clay, silt, finely divided organic and inorganic matter, and microscopic organisms such as plankton contribute to turbidity in natural waters. Turbidity is monitored in drinking water supplies primarily as an indicator for the potential presence of pathogens or toxic substances including synthetic organic chemicals and metals. The Surface Water Treatment Rule requires water supplies to have turbidity levels of less than 5 NTU at all times at the entry point of the distribution system.

### **2.1.2 LAKES AND RESERVOIRS IN THE TOWN OF SOUTHEAST**

Current water quality conditions in each of the reservoirs and major water bodies within the Town of Southeast are described below. The information was obtained from NYSDEC's *The 1996 Priority Waterbodies List for The Lower Hudson River Basin* (NYSDEC PWL) and from NYSDEC Water Quality Regulations. The NYSDEC PWL identifies use impairments, type of pollutants, and pollution sources for waterbodies in the Lower Hudson River Basin. A water body is considered "water quality limited" when technology-based effluent limitations are not enough to achieve water quality standards. Under the Watershed Regulations, a reservoir is considered "Phosphorus Restricted" if its mean phosphorus concentration exceeds 20 µg/l (15 µg/l for source water reservoirs). NYCDEP conducts an annual review of reservoir basins to determine if water quality meets established standards.

Additional information was obtained from NYCDEP's *Water Quality and Surveillance Monitoring* report (November 1997), *Proposed Phase I Phosphorus TMDL* dated June 1996

("Phase I Report"), and the *Proposed Phase II Phosphorus TMDL* report submitted in March 1999 to the NYSDEC ("Phase II Report"). The official Phase II TMDLs were submitted by the NYSDEC to the USEPA in June 2000 and were approved in October 2000.

#### *BOG BROOK RESERVOIR*

Bog Brook Reservoir is a NYSDEC Priority Water body that measures 390 acres. The reservoir is a class A water body whose best uses are water supply, culinary or food processing purposes, primary or secondary contact recreation, fishing, fish propagation and survival, and aesthetics.

According to the NYSDEC PWL, the Bog Brook Reservoir is use impaired as a water supply, and for fishing, fish propagation, fish survival and aesthetics. The primary use of this reservoir as a drinking water supply source is stressed by high levels of nutrients resulting from urban runoff. Types of pollution include nutrients and silt. Sources of pollution include urban runoff, construction (residential and commercial developments), failing on-site septic systems, and storm sewers.

#### *Phosphorus*

Using a phosphorus guidance value of 20 µg/l, the Phase II TMDL for the Bog Brook Reservoir is 827 lbs/yr. Based on this phosphorus guidance value, the Bog Brook Reservoir would not be water quality limited and would not require non-point phosphorus load reductions.

The tunnel connection between the Bog Brook and East Branch Reservoirs may influence water quality in the Bog Brook Reservoir. Phosphorus loadings are two percent from point sources and 98 percent from non-point sources. The mean annual phosphorus levels from 1988 to 1998 ranged from 16 µg/l to 25 µg/l. The mean annual chlorophyll A levels from 1988 to 1998 ranged from 2.1 µg/l to 10 µg/l. The total phytoplankton alert level of 2,000 SAU/ml and the single genus alert level of 1,000 SAU/ml, established by the NYCDEP Division of Drinking Water Quality Control, have been exceeded at times.

#### *Fecal Coliform*

Data from the NYCDEP for the years 1988 to 1998 ranged from less than 2 Colony Forming Units (CFU)/100 ml to about 13 CFU/100 ml.

#### *Total Suspended Solids*

Available data from 1988 to 1992 show a range of mean annual total suspended solids in the water column of 1.5 mg/l to 2.7 mg/l.

#### *BREWSTER POND*

This pond is located in the Bog Brook drainage basin. Water quality information for this water body is not available.

#### *CROTON FALLS RESERVOIR*

The Croton Falls Reservoir is a NYSDEC Priority Water Body that measures 1024 acres in area. This reservoir is a class AA(T) waterbody and as such, its best uses are: water supply for drinking, culinary or food processing purposes, primary or secondary contact recreation, fishing, and fish propagation and survival.

According to the NYSDEC PWL, the Croton Falls Reservoir is use impaired as a water supply, and for fishing, fish propagation, fish survival and aesthetics. The primary use of this reservoir

as a drinking water supply source is threatened by nutrients and silt. The reservoir is managed for brown trout but low dissolved oxygen levels in deep water stress the ability of the reservoir to support a brown trout population. The primary nutrient source in the basin is WWTP effluent. Other pollution sources include urban runoff, construction (residential and commercial developments), failing on-site septic systems, and storm sewers.

*Phosphorus*

The Phase II TMDL for the Croton Falls Reservoir, using the source water 15 µg/l phosphorus guidance value, is 7,861 lbs/yr. Based on this guidance value, the Croton Falls Reservoir would be water quality limited and would require non-point phosphorus load reductions of 1,299 lbs/yr. The necessary non-point phosphorus load reduction was calculated assuming the WWTPs in the reservoir basin would be upgraded as required by the Watershed Rules and Regulations, and that upstream reservoir basins would meet their phosphorus guidance values.

The phosphorus loading from upstream reservoirs affect water quality in the Croton Falls Reservoir. Phosphorus loadings are 52 percent from point sources, 28 percent from upstream reservoirs and 20 percent from non-point sources. The mean annual phosphorus levels from 1988 to 1998 ranged from 19 µg/l to 44 µg/l. The mean annual chlorophyll A levels from 1988 to 1998 ranged from 7.8 µg/l to 28 µg/l. The total phytoplankton alert level of 2,000 SAU/ml and the single genus alert level of 1,000 SAU/ml established by the NYCDEP Division of Drinking Water Quality Control have been exceeded at times.

*Fecal Coliform*

Data from the NYCDEP for the years 1988 to 1998 ranged from less than 2 CFU/100ml to about 22 CFU/100 ml.

*Total Suspended Solids*

Available data from 1988 to 1992 shows a mean annual total suspended solids range in the water column of 1.9 mg/l to 3.8 mg/l.

**DIVERTING RESERVOIR**

The Diverting Reservoir is a NYSDEC Priority waterbody that measures 518 acres in area. This reservoir is a class A waterbody the best uses of which are water supply for drinking, culinary or food processing purposes, primary or secondary contact recreation, fishing, and fish propagation and survival.

According to the NYSDEC PWL, the Diverting Reservoir is use impaired as a water supply, and for fishing, fish propagation, fish survival and aesthetics. The primary use of this reservoir as a drinking water supply source, is threatened by high levels of nutrients resulting from urban runoff. Types of pollution include nutrients and silt. Sources of pollution include urban runoff, construction (residential and commercial developments), WWTPs, failing on-site septic systems, and storm sewers.

*Phosphorus*

Using a phosphorus guidance value of 20 µg/l, the Phase II TMDL for the Diverting Reservoir is 6,170 lbs/yr. Based on this phosphorus guidance value, this reservoir would be water quality limited and would require non-point phosphorus load reductions of 2,168 lbs/yr. The necessary non-point phosphorus load reduction was calculated assuming the WWTPs in the reservoir basin

would be upgraded as required by the Watershed Rules and Regulations and that upstream reservoir basins would meet their phosphorus guidance values.

The phosphorus loading from upstream reservoirs affects water quality in the Diverting Reservoir. Phosphorus loadings are 10 percent from point sources, 73 percent from upstream reservoirs, and 17 percent from non-point sources. The mean annual phosphorus levels from 1988 to 1998 ranged from 19 µg/l to 34 µg/l. The mean annual chlorophyll A levels from 1988 to 1998 ranged from 6.0 µg/l to 30 µg/l. The total phytoplankton alert level of 2,000 SAU/ml and the single genus alert level of 1,000 SAU/ml, established by the NYCDEP Division of Drinking Water Quality Control, have been exceeded at times.

#### *Fecal Coliform*

Data from NYCDEP for the years 1988 to 1998 ranged from less than 2 CFU/100ml to about 75 CFU/100 ml.

#### *Total Suspended Solids*

Available data from 1988 to 1992 shows a mean annual total suspended solids range in the water column of 2.7 mg/l to 6.2 mg/l.

#### *EAST BRANCH RESERVOIR*

The East Branch Reservoir is a NYSDEC Priority waterbody that measures 512 acres in area. This reservoir is a class A waterbody and as such, its best uses are water supply for drinking, culinary or food processing purposes, primary or secondary contact recreation, fishing, and fish propagation and survival.

According to the NYSDEC PWL, the East Branch Reservoir is use impaired as a water supply, and for fishing, fish propagation, fish survival and aesthetics. The primary use of this reservoir as a drinking water supply source is stressed by high levels of nutrients resulting from urban runoff. Types of pollution include nutrients and silt. Sources of pollution include urban runoff, construction (residential and commercial developments), WWTPs, failing on-site septic systems, and storm sewers.

#### *Phosphorus*

Using a phosphorus guidance value of 20 µg/l, the Phase II TMDL for the East Branch Reservoir is 6,223 lbs/yr. Based on this phosphorus guidance value, this reservoir would be water quality limited and would require non-point phosphorus load reductions of 2,190 lbs/yr. The necessary non-point phosphorus load reduction was calculated assuming the WWTPs in the reservoir basin would be upgraded as required by the Watershed Rules and Regulations, and that upstream reservoir basins would meet their phosphorus guidance values.

Phosphorus loadings are 10 percent from point sources, and 90 percent from non-point sources. The mean annual phosphorus levels from 1988 to 1998 ranged from 15 µg/l to 31 µg/l. The mean annual chlorophyll A levels from 1988 to 1998 ranged from 4.4 µg/l to 31 µg/l. The total phytoplankton alert level of 2,000 SAU/ml and the single genus alert level of 1,000 SAU/ml, established by the NYCDEP Division of Drinking Water Quality Control have been exceeded at times

*Fecal Coliform*

Data from the NYCDEP for the years 1988 to 1998 ranged from less than 2 CFU/100ml to about 25 CFU/100 ml.

*Total Suspended Solids*

Available data from 1988 to 1992 show a mean annual total suspended solids range in the water column of 1.9 mg/l to 4.4 mg/l.

*HAINES POND*

This pond is located in the East Branch drainage basin. Water quality information for this water body is not available.

*LAKE TONETTA*

Lake Tonetta is a NYSDEC Priority waterbody that measures 74 acres in area. This lake is a class B waterbody and as such, its best uses are primary or secondary contact recreation, fishing, and fish propagation and survival.

This lake is located in the Diverting Reservoir drainage basin. Weed growth, blue/green algae, and high coliform counts force occasional beach closings stressing use of lake for bathing. Weeds also stress boating, fishing, and aesthetics. About one quarter of the lake is covered with weeds. The main concerns are high phosphorus levels, low bottom dissolved oxygen levels, and high coliform counts. Other concerns are failing septic systems (according to the Putnam County Department of Health) and runoff from heavily fertilized lawns. Pollution types include nutrients, silt, oxygen demand, and pathogens. Pollution sources include failing on-site septic systems, urban runoff, storm sewers, and construction (residential and commercial developments).

*MIDDLE BRANCH RESERVOIR*

The Middle Branch Reservoir is a NYSDEC Priority waterbody that measures 400 acres in area. This reservoir is a class A waterbody and as such, its best uses are water supply for drinking, culinary or food processing purposes, primary or secondary contact recreation, fishing, and fish propagation and survival.

According to the NYSDEC PWL, the Middle Branch Reservoir is use impaired as a water supply, and for fishing, fish propagation, fish survival and aesthetics. The primary use of this reservoir as a drinking water supply source, is threatened by high levels of nutrients resulting from on-site septic systems. Types of pollution include nutrients, silt (sediment), oxygen demand, and pathogens. Sources of pollution include urban runoff, construction (residential and commercial developments), failing on-site septic systems, storm sewers, and WWTPs. Low dissolved oxygen levels in the deeper portion of the reservoir is stressing trout survival. These low oxygen levels are being caused by the die off and decay of algae. The primary pollutant is phosphate. Inflows from Lake Carmel may also be feeding nutrients into the reservoir.

*Phosphorus*

Using a phosphorus guidance value of 20 µg/l, the Phase II TMDL for the Middle Branch Reservoir is 2,093 lbs/yr. Based on this phosphorus guidance value, this reservoir would be water quality limited and would require non-point phosphorus load reductions of 450 lbs/yr. The

necessary non-point phosphorus load reduction was calculated assuming the WWTPs in the reservoir basin would be upgraded as required by the Watershed Rules and Regulations.

The phosphorus loading from upstream waterbodies affects water quality in the Middle Branch Reservoir. Phosphorus loadings are 11 percent from point sources, 52 percent from Lake Carmel, and 37 percent from non-point sources. The mean annual phosphorus levels from 1988 to 1998 ranged from 14 µg/l to 35 µg/l. The mean annual chlorophyll A levels from 1988 to 1998 ranged from 3.5 µg/l to 20 µg/l. The total phytoplankton alert level of 2,000 SAU/ml and the single genus alert level of 1,000 SAU/ml, established by the NYCDEP Division of Drinking Water Quality Control, have been exceeded at times.

#### *Fecal Coliform*

Data from the NYCDEP for the years 1988 to 1998 ranged from less than 2 CFU/100ml to about 135 CFU/100 ml.

#### *Total Suspended Solids*

Available data from 1988 to 1992 shows a mean annual total suspended solids range in the water column of 2.6 mg/l to 4.8 mg/l.

#### *MUSCOOT RESERVOIR*

There are no lakes or reservoirs in the Town of Southeast that lie within the Muscoot Reservoir drainage basin.

The Muscoot Reservoir is a NYSDEC Priority waterbody that measures 1011 acres in area. This reservoir is a class A waterbody and as such, its best uses are water supply for drinking, culinary or food processing purposes, primary or secondary contact recreation, fishing, and fish propagation and survival.

According to the NYSDEC PWL, the Muscoot Reservoir is use impaired as a water supply, and for fishing, fish propagation, fish survival and aesthetics. The primary use of this reservoir as a drinking water supply source is threatened by high levels of nutrients resulting from urban runoff. Types of pollution include nutrients and silt. Sources of pollution include urban runoff, construction (residential and commercial developments), failing on-site septic systems, storm sewers, and WWTPs.

#### *Phosphorus*

Using a phosphorus guidance value of 20 µg/l, the Phase II TMDL for the Muscoot Reservoir is 20,720 lbs/yr. Based on this phosphorus guidance value, this reservoir would be water quality limited and would require non-point phosphorus load reductions of 4,690 lbs/yr. The necessary non-point phosphorus load reduction was calculated assuming the WWTPs in the reservoir basin would be upgraded as required by the Watershed Rules and Regulations, and that upstream reservoir basins would meet the phosphorus guidance value.

The phosphorus loading from upstream reservoirs affects water quality in the Muscoot Reservoir. Phosphorus loadings are 16 percent from point sources, 47 percent from upstream reservoirs and 37 percent from non-point sources. The mean annual phosphorus levels from 1988 to 1998 ranged from 22 µg/l to 37 µg/l. The mean annual chlorophyll A levels from 1988 to 1998 ranged from 6.3 µg/l to 20 µg/l.

*Fecal Coliform*

Data from the NYCDEP for the years 1988 to 1998 ranged from 3 CFU/100ml to about 248 CFU/100 ml.

*Total Suspended Solids*

Available data from 1988 to 1992 shows a mean annual total suspended solids range in the water column of 4.5 mg/l to 6.9 mg/l.

**PEACH LAKE**

Peach Lake is a NYSDEC Priority waterbody that measures 125 acres in area. This lake is a class B waterbody and as such, its best uses are primary or secondary contact recreation, fishing, and fish propagation and survival.

This lake is located in the East Branch drainage basin. High coliform counts force beach closings each summer impairing the lake for bathing. Heavy weed growth particularly at the northern end of the lake impairs boating and fishing. The lake is also use-impaired for fish propagation, fish survival, and aesthetics. The lake is located half in Putnam County and half in Westchester County. According to the Putnam County Department of Health, many on-site septic systems surrounding Peach Lake are inadequate due to small lot sizes, inadequate soils, and undersized systems. These conditions result in nutrients, pathogens, floatables, and oxygen demanding substances entering Peach Lake. Pollution types include nutrients, silt, oxygen demand, and pathogens. Sources of pollution include construction, urban runoff, on-site septic systems, and waterfowl.

## **2.2 WATER QUALITY TRENDS**

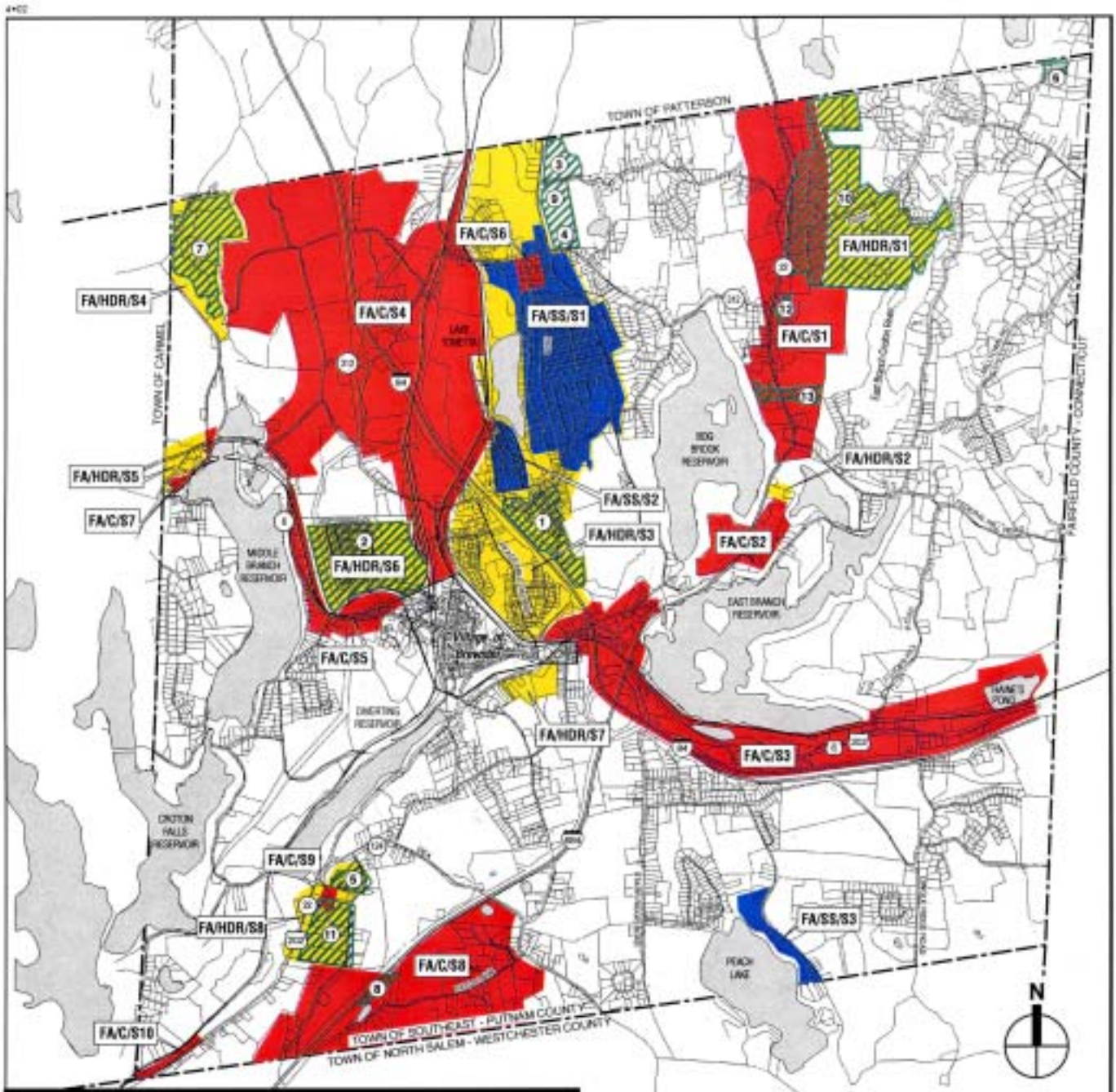
NYCDEP provided water quality data for the period of 1988 to 1998. However, these data were scattered and non-continuous and did not provide conclusive evidence of any trends. In order to examine trends in water quality and to try to compare them with long term trends in land use change, longer term water quality data are needed. According to NYCDEP, reliable data going back several decades is not available. Therefore, it is not possible to provide accurate comment on the effects of development and growth on water quality or to identify long term trends in water quality.

## **2.3 SOURCES OF CONTAMINATION**

### **2.3.0 FOCUS AREAS**

The *Putnam County Croton Watershed Diversion Feasibility Study—Phase 1* (the “Diversion Report”) identifies areas of known or potential sources of water quality contamination. The Diversion Report identified both “point sources”—those that can be easily identified by a particular discharge pipe or discharge permit, and “non-point sources”—general runoff from both developed and undeveloped land. The non-point sources were further identified as “Focus Areas” by type of development or area of concern and include: areas of known or potential septic system failure, high-density residential zoned areas, commercial zoned areas, and industrial zoned areas. Within Southeast there are three Septic System Focus Areas, nine High Density Residential Focus Areas, and ten Commercial Focus Areas. (The Diversion Report also identified Industrial Zoned areas, but there are none in Southeast). Figure 2.3-1 identifies the location of each Focus Area and each wastewater treatment plant (WWTP) and its service area.





Base Map Data Provided by Putnam County

**LEGEND**

- Municipal Boundary
- Village of Brewster
- Water Bodies
- High Density Residential Focus Area
- Commercial Focus Area
- Septic System Focus Area
- WWTP Service Area
- Wastewater Treatment Plant (See Table 2.3-2)

Source: Putnam County Croton Watershed Diversion Feasibility Study, Planning Composite & Piping Schematic, Plate P-1



This section summarizes the findings of the Diversion Report with respect to phosphorus loading from each of the point- and non-point-sources of water quality contamination.

### **2.3.1 SEPTIC SYSTEM FOCUS AREAS**

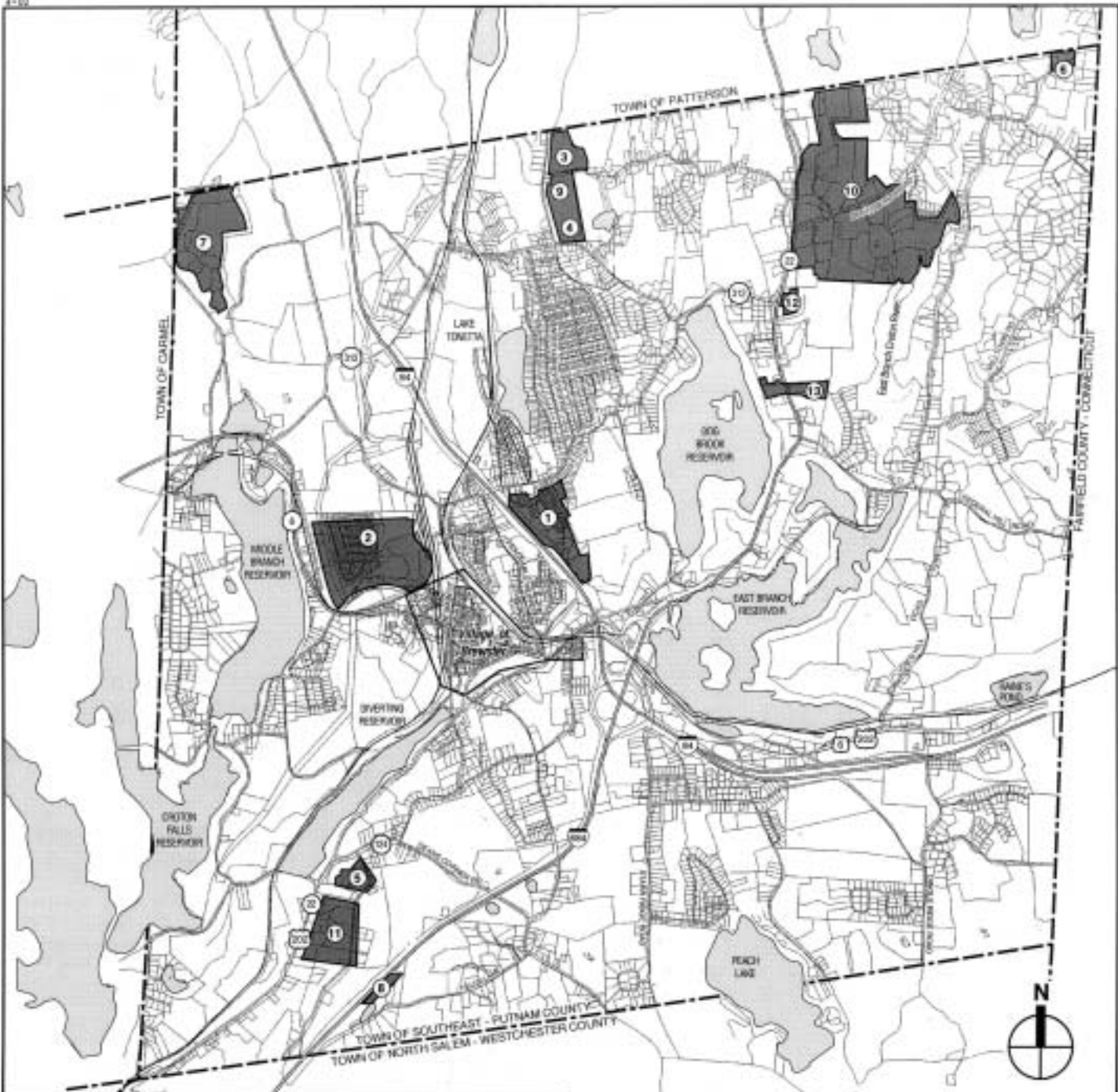
The majority of the Town of Southeast utilizes subsurface sewage treatment systems (SSTSs)—septic systems—to accommodate sewer needs. According to US Census Bureau data for 1990, 74 percent of all housing units in the Town of Southeast rely on SSTSs. Older areas of dense development, which are served by SSTSs, have high potential for septic failure due to the small lot size and the concentration of sub-surface systems. The Putnam County Department of Health (PCDOH) administers an SSTS repair permit program that tracks and reviews SSTS failures and repairs. The PCDOH has identified three areas of existing or potential SSTS failure in the Town of Southeast: 1) the North Brewster Road residential area, 2) the residential area southwest of Lake Tonetta, and 3) the residential area on the east side of Peach Lake (see Figure 2-3.1).

Table 2.3-1 summarizes the phosphorus loading from each of the Septic System Focus Areas attributed to sewage flow and surface runoff from developed and undeveloped areas within the Focus Area. Septic systems that fail can discharge partially treated wastewater to the surface and thus can contribute phosphorus loading to the watershed. In estimating the phosphorus load from failing septic, it was assumed that 30 percent of the septic systems in these areas fail during wet periods, which were assumed to occur 25 percent of the time. Based on journal articles, phosphorus removal from overland flow was estimated at 13 percent. Functioning septic systems discharge wastewater to the soil's subsurface. Based on journal articles, phosphorus removal through soil percolation was estimated at 85 percent. The calculated phosphorus loads presented in Table 2.3-1 are based on the above information.

### **2.3.2 POINT SOURCE DISCHARGES**

The primary type of point source discharge is wastewater treatment plants. There are thirteen surface discharging WWTPs in the Town of Southeast. Table 2.3-2 identifies the name, the State Pollutant Discharge Elimination System (SPDES) Permit number, the measured flow (in millions of gallons per day), and the permitted flow for each WWTP. Figure 2.3-2 identifies each WWTP and its service area. Point source discharges from these WWTPs are permitted by the NYSDEC through the issuance of SPDES permits. Under the Memorandum of Agreement, NYCDEP will fund improvements to all WWTPs in the watershed to advanced treatment at each plant.

Table 2.3-3 summarizes the current sanitary phosphorus loading from each of the WWTPs.



Base Map Data Provided by Putnam County

**LEGEND**

- Municipal Boundary
- Village of Brewster
- Water Bodies
- WWTP Service Area
- Wastewater Treatment Plant (See Table 2.3-2)

Source: Putnam County Croton Watershed Diversion Feasibility Study, Planning Composite & Piping Schematic, Plate P-1

## Wastewater Treatment Plants and Service Areas

Figure 2.3-2

**Table 2.3-1  
Current Phosphorus Loading from Septic System Focus Areas**

<b>Focus Area</b>	<b>Location</b>	<b>Reservoir Basin</b>	<b>Estimated Flow (mgd)</b>	<b>P Load from Sanitary Flow (lbs/day)</b>	<b>P Load of Runoff from Developed Portions of Service Area (lbs/day)</b>	<b>P Load of Runoff from Undeveloped Portions of Service Area (lbs/day)</b>
FA/SS/S1	North Brewster Road	Diverting	0.2601	1.74	—	—
FA/SS/S2	Lake Tonetta	Diverting	0.0517	0.35	—	—
FA/SS/S3	Peach Lake	East Branch	0.0408	0.27	—	—
		<b>Total P Daily Load</b>	<b>3.49</b>	<b>2.36</b>	<b>1.08</b>	<b>0.05</b>
		<b>Total P Annual Load</b>	<b>1273.85</b>	<b>861.40</b>	<b>394.20</b>	<b>18.25</b>
<b>Source:</b> Diversion Report, Tables 3-10 and 7-14, using Phase II phosphorus export coefficients.						

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**Table 2.3-2  
Wastewater Treatment Plants**

No.	WWTP Name	Ownership	SPDES Permit No.	Reservoir Basin	Measured Flow (mgd)	SPDES Permitted Flow (mgd)
1	Blackberry Hill Sanitary S.D.	Public	62570	Diverting	0.0520	0.0747
2	Brewster Heights S.D. No. 1	Public	110353	Diverting	0.1250	0.1500
3	Brewster High School	Public	29521	East Branch	0.0033	0.0150
4	Henry H. Wells Middle School	Public	29530	East Branch	0.0040	0.0210
5	Holly Stream Condominiums	Private	35254	Muscoot	0.0120	0.0190
6	Hostel No. 1228 Welfare Road	Public	208108	East Branch	0.0007	0.0021
7	Hunters Glen	Private	165531	Middle Branch	0.0550	0.0685
8	I-684 Rest Area No. 45	Public	35955	Muscoot	0.0031	0.0120
9	John F. Kennedy Elementary School	Public	29548	East Branch	0.0050	0.0110
10	Mount Ebo Corporate Center	Private	148946	East Branch	0.0670	0.1600
11	Reed Farms Condominiums	Private	145858	Muscoot	0.0213	0.0500
12	Towne Centre	Private	219045	Bog Brook	0.0190	0.0200
13	Tracy Tertiary (Clock Tower)	Private	214418	East Branch	0.0097	0.0200
<b>Source:</b> Diversion Report, Tables 3-1 and 3-4.						

**Table 2.3-3  
Current Phosphorus Loading from Wastewater Treatment Plants and Service Areas**

<b>No.</b>	<b>WWTP Name</b>	<b>Reservoir Basin</b>	<b>Measured Flow (mgd)</b>	<b>P Load from Sanitary Flow (lbs/day)</b>	<b>P Load of Runoff from Developed Portions of Service Area (lbs/day)</b>	<b>P Load of Runoff from Undeveloped Portions of Service Area (lbs/day)</b>
1	Blackberry Hill Sanitary S.D.	Diverting	0.0520	0.35	0.10	0.02
2	Brewster Heights S.D. No. 1	Diverting	0.1250	0.31	0.18	0.05
3	Brewster High School	East Branch	0.0033	0.11	0.06	0.00
4	Henry H. Wells Middle School	East Branch	0.0040	0.13	0.05	0.00
5	Holly Stream Condominiums	Muscoot	0.0120	0.40	0.04	0.00
6	Hostel No. 1228 Welfare Road	East Branch	0.0007	0.02	0.00	0.00
7	Hunters Glen	Middle Branch	0.0550	0.18	0.12	0.04
8	I-684 Rest Area No. 45	Muscoot	0.0031	0.10	0.02	0.00
9	John F. Kennedy Elementary School	East Branch	0.0050	0.17	0.05	0.00
10	Mount Ebo Corporate Center	East Branch	0.0670	0.39	0.35	0.11
11	Reed Farms Condominiums	Muscoot	0.0213	0.05	0.09	0.02
12	Towne Centre	Bog Brook	0.0190	0.05	0.02	0.00
13	Tracy Tertiary (Clock Tower)	East Branch	0.0097	0.02	0.02	0.01
		<b>Total P Daily Load (lbs)</b>	<b>3.63</b>	<b>2.28</b>	<b>1.10</b>	<b>0.25</b>
		<b>Total P Annual Load (lbs)</b>	<b>1324.95</b>	<b>832.20</b>	<b>401.50</b>	<b>91.25</b>

**Source:** Diversion Report, Tables 7-1 and 7-5, using Phase II phosphorus export coefficients.

### 2.3.3 NON-POINT SOURCE DISCHARGES

The Diversion Report identified High Density Residential Focus Areas and Commercial Focus Areas where more intense development has historically occurred or where new development could occur. Each of these Focus Areas contribute phosphorus from both sanitary (septic) sources and from surface runoff from developed and undeveloped areas. Land outside of these Focus Areas are generally rural residential and are not considered to pose as significant a threat to water quality. However, rural residential areas do contribute phosphorus and other contaminants to water bodies but it is presumed that these areas have sufficient land area to create suitable septic disposal fields. Following the discussion of the Focus Areas is a brief description of general considerations with respect to non-point sources.

#### *WASTEWATER TREATMENT PLANT SERVICE AREAS*

In addition to point source phosphorus loads, phosphorus load due to surface runoff is another component of the total phosphorus load from WWTP service areas. Table 2.3-3 summarizes the runoff phosphorus loads for both developed and undeveloped land within the WWTP service areas. These estimates were calculated using standard wastewater phosphorus concentrations and Phase II runoff export coefficients.

#### *HIGH DENSITY RESIDENTIAL FOCUS AREAS*

The High Density Residential Focus Areas include some of the older residential communities in Southeast such as Brewster Heights, North Brewster Road, and Peaceable Hill Road. They also include some of the newer condominium or townhouse development such as Fieldstone Pond, Virginia Woods, Twin Brook Manor, Reed Farm, and Eagle Ridge (see Figure 2-3.1). These areas of single-family homes on smaller lots or planned developments contribute phosphorus from sewage flow and from surface runoff.

Table 2.3-4 summarizes the phosphorus loading from each of the High Density Residential Focus Areas attributed to sewage flow and surface runoff from developed and undeveloped areas within the Focus Area. These estimates were calculated using standard wastewater phosphorus concentrations and Phase II runoff export coefficients.

#### *COMMERCIAL FOCUS AREAS*

The Commercial Focus Areas include any land currently zoned for commercial purposes. These Focus Areas are located along Routes 6 and 22, in the Fields Lane area, and at the interchange of I-84 and NYS Route 312 (see Figure 2-3.1).

Table 2.3-5 summarizes the phosphorus loading from each of the Commercial Focus Areas attributed to sewage flow and surface runoff from developed and undeveloped areas within the Focus Area. These estimates were calculated using standard wastewater phosphorus concentrations and Phase II runoff export coefficients.

#### *OTHER NON-POINT SOURCES*

Most areas of development within the Town include some level of stormwater facilities. The systems vary in extent, complexity, condition, and effectiveness. Concentration of stormwater from pipes or ditches can be considered point discharges where a stormwater collection system has a defined discharge point. However, stormwater discharges can also occur throughout a watershed and are most often considered non-point source discharges.

**Table 2.3-4  
Current Phosphorus Loading from High Density Residential Focus Areas**

<b>Focus Area</b>	<b>Location</b>	<b>Reservoir Basin</b>	<b>Sewage Flow (mgd)</b>	<b>P Load from Sewage Flow (lbs/day)</b>	<b>P Load of Runoff from Developed Portions of Service Area (lbs/day)</b>	<b>P Load of Runoff from Undeveloped Portions of Service Area (lbs/day)</b>
FA/HDR/S1	Fieldstone Pond	East Branch	.	*		
FA/HDR/S2	Virginia Woods	East Branch	0.0058	0.03	0.02	0.00
FA/HDR/S3	Lake Tonetta/Brewster Hill Road	East Branch, Bog Brook, Diverting	0.1350	0.67	0.59	0.18
FA/HDR/S4	Twin Brook Manor	Middle Branch	0.0003	0.00	0.04	0.01
FA/HDR/S5	Route 6/Tilly Foster	Middle Branch	0.0088	0.04	0.02	0.01
FA/HDR/S6	Brewster Heights/Eagle Ridge	East Branch, Diverting	.	**		
FA/HDR/S7	Route 22/Allview Avenue	Diverting	0.0044	0.02	0.02	0.01
FA/HDR/S8	Reed Farm/Holly Stream	Muscoot	0.0017	0.01	0.02	0.01
		<b>Total P Daily Load (lbs)</b>	<b>1.68</b>	<b>0.77</b>	<b>0.69</b>	<b>0.23</b>
		<b>Total P Annual Load (lbs)</b>	<b>613.20</b>	<b>281.05</b>	<b>251.85</b>	<b>80.30</b>
<b>Notes:</b> * - Entirely within Mount Ebo WWTP Service Area ** - Entirely within Brewster Heights S.D. No. 1 Service Area						
<b>Source:</b> Diversion Report, Tables 3-10 and 7-14, using Phase II phosphorus export coefficients.						



**Table 2.3-5**  
**Current Phosphorus Loading from Commercial Focus Areas**

Focus Area	Location	Reservoir Basin	Sewage Flow (mgd)	P Load from Sewage Flow (lbs/day)	P Load of Runoff from Developed Portions of Service Area (lbs/day)	P Load of Runoff from Undeveloped Portions of Service Area (lbs/day)
FA/C/S1	Route 22: Patterson to Milltown	Bog Brook, East Branch	0.0810	0.41	0.09	0.18
FA/C/S2	Route 22: Heidi's/Kisawana	Bog Brook, East Branch	0.0200	0.10	0.02	0.04
FA/C/S3	Route 6: East of Village	East Branch	0.0742	0.37	0.08	0.18
FA/C/S4	Route 312/I-84, Brewster North	Middle Branch, Diverting, East Branch	0.2176	1.09	0.24	0.53
FA/C/S5	Route 6: West of Village	Middle Branch, Diverting	0.0116	0.06	0.01	0.03
FA/C/S6	Route 312/North Brewster Road	East Branch, Diverting	.	*		
FA/C/S7	Brewster Road at Route 6	Middle Branch	0.0018	0.01	0.00	0.01
FA/C/S8	Fields Lane	Muscoot	0.1008	0.50	0.11	0.19
FA/C/S9	Lower Mine Road NB-1 District	Muscoot	0.0008	0.00	0.00	0.00
FA/C/S10	Route 22/Croton Falls	Muscoot	0.0004	0.00	0.00	0.01
		<b>Total P Daily Load (lbs)</b>	<b>4.26</b>	<b>2.54</b>	<b>0.56</b>	<b>1.16</b>
		<b>Total P Annual Load (lbs)</b>	<b>1554.90</b>	<b>927.10</b>	<b>200.75</b>	<b>427.05</b>
<b>Notes:</b> * - Entirely within Brewster Heights S.D. No. 1 Service Area						
<b>Source:</b> Diversion Report, Tables 3-10 and 7-14, using Phase II phosphorus export coefficients.						

*Roads and Other Impervious Surfaces*

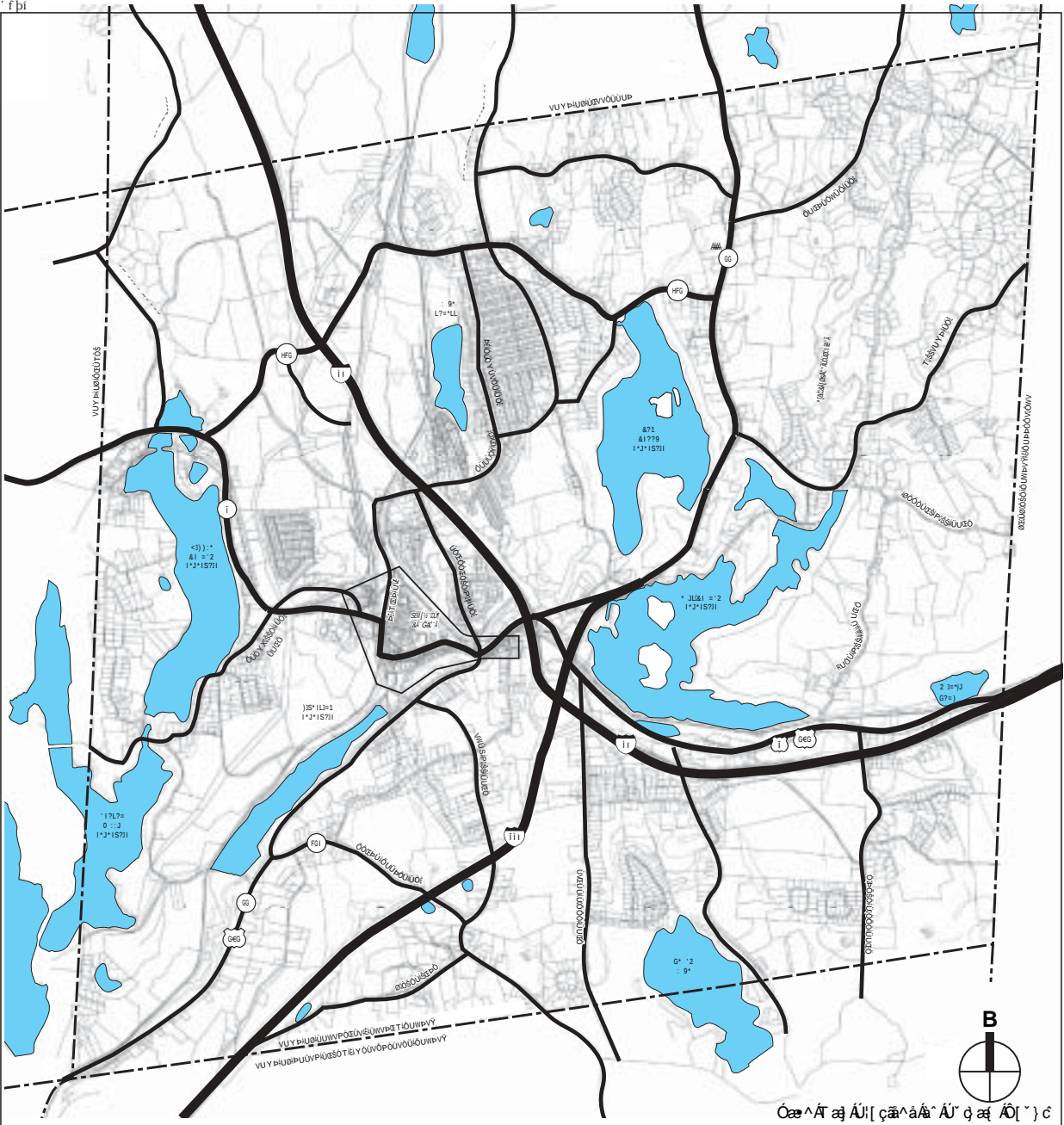
Impervious surfaces created by development, require particular attention to stormwater management. Areas that include significant impervious surfaces include highways, commercial/industrial areas, and high-density residential areas.

Table 2.3-6 lists the major interstate, state, county, and Town roads located in the Town (see Figure 2.3-3). In addition to these roads, the Town of Southeast Highway Department maintains approximately 80 miles of local roads. These local roads contain approximately 1,300 catch basins and related piping. The Highway Department has initiated a program to collect data on these systems for a future digital database. The Highway Department has purchased a “vac-all” truck for cleaning catch basins and drainage structures. Catch basins are inspected weekly and cleaned on an as-needed basis.

**Table 2.3-6  
Major Roads**




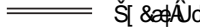
<b>Interstate Highways</b>
I-84
I-684
<b>New York State Highways</b>
US Route 6/202
NYS Route 22
NYS Route 124
NYS Route 312
<b>Putnam County Highways</b>
CR 36 — Drewville Road
CR 51 — Turk Hill Road
CR 53 — Peaceable Hill Road
CR 54 — Milltown Road
CR 57 — John Simpson Road
CR 58 — North Brewster Road
CR 59 — Crosby Avenue
CR 60 — Fair Street
CR 62 — Farm to Market Road
CR 65 — Doansburg Road (Putnam Lake Road)
<b>Town of Southeast Roads</b>
Foggintown Road
Brewster Hill Road
Dingle Ridge Road
Starr Ridge Road
Peach Lake Road
Fields Lane
Minor Road
Prospect Hill Road

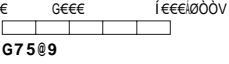
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Όλες οι πληροφορίες είναι υπόκεινται σε αλλαγές χωρίς προειδοποίηση.

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-  Σιδηρόδρομος



*Agriculture*

Agricultural uses can contribute to non-point discharge of pollutants through application or storage of manure, application of fertilizers or pesticides, or soil erosion. The Putnam County Soil & Water Conservation District has received a grant to conduct an inventory and environmental assessment of agricultural operations within the NYC watershed in Putnam County. Approximately 24 parcels totaling 855 acres have been identified in the County’s preliminary inventory. The Phase II TMDLs include specific data for phosphorus loading from agricultural land.

*Golf Courses*

There are three golf courses in the Town of Southeast: Centennial Golf Club is located in the northwest corner of Town on John Simpson Road; Vail’s Grove Golf Course is located in the southeastern portion of the Town on Peach Lake Road; and Milltown Golf Course on Milltown Road. These golf courses are private property and implement their own Best Management Practices (BMPs) for turf and pest management, subject to the Watershed Regulations.

*Concentrated Areas of Lawn Near Reservoirs/Reservoir Stems*

NYCDEP owns land surrounding most of their reservoirs and reservoir stems in the Town of Southeast. This land serves as a buffer strip to prohibit development directly adjacent to the reservoirs and reservoir stems. The NYCDEP ownership buffer is narrowest surrounding the Middle Branch Reservoir. Some development along US Route 6, on the east side of the reservoir, has lawn areas in close proximity to the reservoir.

*Fuel Storage*

Fuel storage tanks in excess of 1,100 gallons require registration with NYSDEC pursuant to 6 NYCRR, Part 612, “Registration of Petroleum Storage Facilities.” Such facilities are also regulated by the Watershed Regulations (§18-32). A list of registered tanks, and a list of any reported spills associated with these tanks, is available from NYSDEC.

*Sand/Salt Storage*

Table 2-3.7 identifies the sand/salt storage facilities in the Town of Southeast. The Town currently stores all sand/salt products at its Highway Department facility on Palmer Road. The Town recently constructed a sand/salt storage building at this location. The New York State DOT facility on Route 22 would likely be relocated and redesigned as part of the Route 22 improvements. Storage and use of sand and salt is regulated by the Watershed Regulations (§18-45).

**Table 2-3.7  
Sand/Salt Storage Facilities**

<b>Facility</b>	<b>Location</b>
New York State Department of Transportation	NYS Route 22 south of Milltown Road
Putnam County Department of Highways & Facilities	Old Sodom Road
Town of Southeast Highway Department	Palmer Road

*Junk Yards*

Table 2-3.8 identifies the existing junk yard facilities in the Town of Southeast. The Simon Auto Wreckers location is directly adjacent to the Middle Branch Reservoir.

**Table 2-3.8  
Existing Junk Yards**

<b>Facility</b>	<b>Location</b>
Brewster Auto Wrecking & Parts	NYS Route 312 east of Metro-North Railroad line
Simon Auto Wreckers	Old Mine Road

**2.3.4 STREAMBANK STABILIZATION**

Changes to the landscape inherent in land development can alter drainage patterns over land and within stream channels. Increased impervious surface area may increase the rate of runoff such that the rate of water flow in a stream is also increased, leading to potential streambank erosion. Sedimentation from suburban construction areas and other disturbances to the land may be carried to streams altering stream energy and leading to alterations in streambank stability.

Neither NYCDEP, Putnam County, nor the Town of Southeast maintains data regarding locations requiring stream bank stabilization. Town and State stormwater management regulations require that new development manage stormwater on-site so that there is no net increase in the peak flow rate of water leaving the site. On-site detention basins provide both attenuation functions (holding water to lower the storm peak) and water quality functions (settling of sediment carried in the storm water). These measures help to protect streams from new development but do not address potential effects from existing development patterns. NYCDEP should fund a program to assist private land owners to implement streambank stabilization measures where appropriate. The Town of Southeast will identify and correct areas of streambank weakness on Town-owned property.

**2.3.5 SUMMARY OF EXISTING PHOSPHORUS LOADS**

Table 2.3-9 summarizes the total phosphorus loads from the primary sources identified in the Diversion Report.

**2.4 ASSESS FUTURE PHOSPHORUS LOADS**

**2.4.1 SUMMARY OF TOWN-WIDE DIVERSION REPORT CALCULATIONS**

New developments in the watershed could result in an increase in point- and non-point-source phosphorus loads. Areas in the Town of Southeast where new development could occur according to the analysis conducted in the *Putnam County Croton Watershed Diversion Feasibility Study, Phase 1* (the “Diversion Report”) include WWTP service areas and Commercial and High Density Residential Focus Areas.

**Table 2.3-9**  
**Total Current Phosphorus Loads in Southeast**

<b>Source</b>	<b>Total P Load (lbs/day)</b>	<b>P Load of Sewage Flow (lbs/day)</b>	<b>P Load of Runoff from Developed Portions of Service Area (lbs/day)</b>	<b>P Load of Runoff from Undeveloped Portions of Service Area (lbs/day)</b>
Septic System Focus Areas	3.49	2.36	1.08	0.05
High Density Residential Focus Areas	1.69	0.77	0.69	0.23
Commercial Focus Areas	4.26	2.54	0.56	1.16
WWTPs and Service Areas	3.63	2.28	1.10	0.25
<b>Total Daily Load (lbs)</b>	<b>13.07</b>	<b>7.95</b>	<b>3.43</b>	<b>1.69</b>
<b>Total Annual Load (lbs)</b>	<b>4770.55</b>	<b>2901.75</b>	<b>1251.95</b>	<b>616.85</b>

Current sanitary phosphorus loading from point sources (WWTPs) was calculated using actual plant data for effluent flow and phosphorus concentrations in the *Diversion Report*. Where actual data on effluent phosphorus concentrations was not available, an industry standard value of 4 mg/l was assumed. The total sanitary point phosphorus load to the watershed from these plants was calculated as 832.20 lbs/yr (see Table 2.4-1).

Projected (to year 2030) sanitary phosphorus loads for the WWTPs in the Town of Southeast, as stated in the *Diversion Report*, were calculated assuming each plant would be discharging at its maximum SPDES permitted flow and assuming the phosphorus effluent limits set forth in the New York City Watershed Rules and Regulations were being met. Two exceptions were the Brewster Heights Sewer District No. 1 and the Towne Centre WWTPs. For these plants, projections indicated that flows could exceed their respective current SPDES permitted capacities, and it was assumed these plants could be expanded, if needed, under the 2 to 1 phosphorus offset variance provision for surface discharging plants in the Watershed Regulations. The total estimated projected sanitary phosphorus load to the Croton Watershed from these plants, as calculated in the *Diversion Report*, is 1,120.55 lbs/yr. Table 2.4-1 summarizes the estimates of projected sanitary phosphorus loads. The estimated increase in phosphorus point source load as a result of growth in the areas served by these WWTPs would therefore be 288.35 lbs/yr (1120.55 minus 832.20).

Current sanitary phosphorus loads from Focus Area sewage discharges were calculated in the *Diversion Report* assuming all the areas use septic systems for their wastewater treatment. For these septic systems, it was assumed that septic tank effluent contains a phosphorus concentration of 4 mg/l and 85 percent of the phosphorus in the effluent is removed through soil percolation. Projected loads were determined assuming each Focus Area would eventually construct a subsurface discharging WWTP with effluent phosphorus limits as required by the Watershed Rules and Regulations. The Focus Area sanitary phosphorus loads shown in Table 2.4-1 are for all the Focus Areas in the Town of Southeast.

Phosphorus loads coming from surface runoff were calculated in the *Diversion Report* by multiplying land areas by an appropriate total phosphorus (TP) export coefficient. Land use is the main factor involved in determining the values of these export coefficients. For Putnam County, it was assumed that all undeveloped lands are a combination of agricultural, forest, and water areas. Developed areas were classified as urban regardless of the level of development.

The TP export coefficients, used for calculating the surface runoff TP loads, were obtained from the NYCDEP *Proposed Phase II Phosphorus TMDL Calculations Report* (“Phase II TMDL Report”). The TP loads to the Croton Watershed from surface runoff were determined by first estimating the amount of developed and undeveloped land for each focus area and WWTP service area. Next, the appropriate export coefficient was applied to the developed and undeveloped areas. This was done for current and projected levels of development. Table 2.4-1 tabulates the current and projected phosphorus runoff loads for the WWTP service areas and Focus Areas in Southeast. The developed area export coefficient used is equal to the urban export coefficient from the Phase II TMDL Report. The undeveloped export coefficient used is an average of the agricultural, forest, and water (atmospheric) export coefficients from the Phase II TMDL Report.

**Table 2.4-1**  
**Current and Projected Phosphorus Loads**  
**WWTPs and Focus Areas**

Source	Sewage Phosphorus Load (lbs/yr)			Surface Runoff Phosphorus Load (lbs/yr)	
	Current	Projected		Current	Projected
		Without Diversion*	With Diversion		
WWTPs & Service Areas	832.20	1120.55	0	492.75	547.50
Focus Areas	2069.55	919.80	288.35	1376.05	1741.05
<b>Totals</b>	<b>2901.75</b>	<b>2040.35</b>	<b>288.35</b>	<b>1868.80</b>	<b>2,288.55</b> **
<b>Total Sewage + Surface Runoff</b>					
Total Current	<b>4770.55 lbs/yr</b>				
Total Projected without Diversion	<b>4328.90 lbs/yr***</b>				
Total Projected with Diversion	<b>2576.90 lbs/yr****</b>				
<p><b>Notes:</b> All current and projected (year 2030) phosphorus loading estimates are as calculated in the <i>Diversion Report</i>, using Phase II phosphorus export coefficients.</p> <p>* - Assumes surface discharging WWTPs are built for Septic Focus Areas and subsurface discharging WWTPs are built for Commercial and High Density Residential Focus Areas, and existing WWTPs are upgraded according to the Watershed Regulations.</p> <p>** - Total increase in phosphorus runoff load as a result of projected development is approximately 419.75lbs/yr (2288.55 minus 1868.80).</p> <p>*** - Upgrading existing WWTPs and constructing new WWTPs for the Focus Areas would decrease the phosphorus load by approximately 441.65 lbs/yr (4770.55 minus 4328.90) from current levels. This reduction takes into account the increase in non-point source loading due to projected development in Southeast.</p> <p>**** - A flow diversion system would decrease the phosphorus load to the Croton Watershed by approximately 2193.65 lbs/yr (4770.55 minus 2576.90) from current levels. This reduction takes into account the increase in non-point source loading due to projected development in Southeast. The phosphorus load reduction presented in the Diversion Report assumed the diversion of all the focus area flows. The reduction shown in this report assumes that only the flows from WWTP service areas and failing septic areas would be diverted.</p>					



Upgrading existing WWTPs and constructing new WWTPs for the Focus Areas would decrease the phosphorus load by approximately 441.65 lbs/yr (4770.55 minus 4328.90) from current levels. This reduction takes into account the increase in non-point source loading due to projected development in Southeast. A flow diversion system that would remove sanitary flows from both existing WWTPs and failing septic areas would decrease the phosphorus load to the Croton Watershed by approximately 2193.65 lbs/yr (4770.55 minus 2576.90) from current levels.

**2.4.2 PHOSPHORUS LOADING WITH RESPECT TO GROWTH CONSISTENT WITH THE TOWN’S COMPREHENSIVE PLAN**

The estimates of phosphorus loads projected in the future for the Town of Southeast just presented assume that development could occur in each of the Focus Areas identified in the Diversion Report. However, the Town of Southeast does not believe that growth will, or should, occur in all Focus Areas identified in the Diversion Report. Table 2.4-2 identifies the “Growth Focus Areas” compatible with the Town of Southeast’s Comprehensive Plan.

**Table 2.4-2  
Growth Focus Areas**

Focus Area	Location	Type of Growth
FA/HDR/S7	Route 22/Allview Avenue	Possible limited residential growth
FA/C/S1	Route 22: Patterson to Milltown Road	General commercial growth
FA/C/S2	Route 22: Heidi’s/Kisawana	Commercial/Campus growth
FA/C/S3	Route 6: East of Village	Commercial/Warehouse growth
FA/C/S4	Route 312/I-84, Brewster North	Commercial office park
FA/C/S5	Route 6: West of Village	Limited in-fill growth
FA/C/S7	Brewster Road at Route 6	Limited in-fill growth
FA/C/S8	Fields Lane	Commercial/Warehouse growth
FA/C/S9	Lower Mine Road NB-1 District	Limited in-fill growth
FA/C/S10	Route 22/Croton Falls	Limited in-fill growth

For these Growth Focus Areas, the current and projected sanitary phosphorus loads to the Croton Watershed, as calculated in the Diversion Report, are 934.40 lbs/yr and 233.60 lbs/yr, respectively. The projected load is lower than the estimated current load due to the increased treatment of sanitary waste from improvements to existing WWTPs as required by the Watershed Regulations. With subsurface discharging plants, instead of septic systems, the sanitary phosphorus load from sewage from the growth focus areas, would decrease by 700.80 lbs/yr (from 934.40 lbs/yr to 233.60 lbs/yr). Subsurface discharging plants, however, may not be a feasible option for all of the Growth Focus Areas due to environmental constraints such as soils, slopes, and setback restrictions.

The *current* calculated surface runoff phosphorus load from WWTP service areas and Growth Focus Areas is 1131.50 lbs/yr. The *projected* calculated surface runoff phosphorus load from WWTP service areas and Growth Focus Areas is 1441.75 lbs/yr. Table 2.4-3 summarizes point- and non-point-source, current and projected phosphorus loads from WWTP service areas, and Growth Focus Areas.

Table 2.4-3  
**Current and Projected Phosphorus Loads from  
 WWTPs and Growth Focus Areas**

<b>Phosphorus Source</b>	<b>Current (lbs/yr)</b>	<b>Projected (lbs/yr)</b>
WWTP Service Areas — Sewage	832.20	1120.55
Growth Focus Areas — Sewage	934.40	233.60
Surface Runoff—Growth Focus Areas and WWTP Service Areas	1131.50	1441.75
<b>Total</b>	<b>2898.10</b>	<b>2795.90</b>

As indicated in Table 2.4-3, the total projected phosphorus load from the WWTP service areas and Growth Focus Areas in the Town of Southeast would be about 102.20 lbs/yr less than the total current estimated load. The increased load from the WWTP service areas and surface runoff would be balanced by providing subsurface discharging treatment plants for the commercial and high density residential areas. As previously mentioned, subsurface discharging plants may not be possible for all of the Growth Focus Areas in Southeast.

3