

The evaluation and ranking of municipal needs gives the Division the priorities in its planning. Present critical needs will be given a higher priority than possible needs based upon predicted growth. The municipal needs will be continually revised through the continuing planning process and through facilities planning and areawide management planning (see page 81).

The individual communities within the SUASCO River Basin were asked to present to the Division their financial need for the construction of publicly owned sewerage systems. Based on the projected 1990 population, the cost estimates were made in eight major categories. The estimates were reported in June 1973 dollars (ENR=1900). Explanation of the categories is given below, and the cost estimates are shown in Table VII-2.

1974 Needs Survey

Category I - This includes costs for facilities which would provide a legally required level of "secondary treatment", or "best practicable wastewater treatment technology" (BPWTT). For the purposes of the Survey, BPWTT and secondary treatment were considered synonymous.

Category II - Costs reported in this category are for treatment facilities that must achieve more stringent levels of treatment. This requirement exists where water quality standards require removal of such pollutants as phosphorus, ammonia, nitrates, or organic substances.

Category IIIA - This includes costs for correction of sewer system infiltration/inflow problems. Costs could also be reported for a preliminary sewer system analysis and for the more detailed Sewer System Evaluation Survey.

Category IIIB - Requirements for replacement or major rehabilitation of existing sewage collection systems are reported in this category. Costs were to be reported if the corrective actions were necessary to the total integrity of the system. Major rehabilitation is considered extensive repair of existing sewers beyond the scope of normal maintenance programs.

Category IVA - This category consists of costs for construction of collector sewer systems designed to correct violations caused by raw discharges, seepage to waters from septic tanks and the like, and/or to comply with Federal, State, or local actions.

Category IVB - This category consists of costs for new interceptor sewers and transmission pumping stations necessary for the bulk transport of wastewaters.

Category V - Costs reported for this category are to prevent periodic bypassing of untreated wastes from combined sewers to an extent violating water quality standards or effluent limitations. It does not include treatment and/or control of stormwaters.

States were also asked to make a rough cost estimate in another category, "Treatment and/or Control of Stormwater." This includes the cost of abating

TABLE VII-2

1974 NEEDS FOR MUNICIPAL WASTEWATER TREATMENT FACILITIES*

SUASCO RIVER BASIN

MUNICIPALITY	SECONDARY TREATMENT	ADVANCED TREATMENT	INFILTRATION	COLLECTOR REHABILITATION	COLLECTOR CONSTRUCTION	INTERCEPTORS	COMBINED SEWERS
Billerica	5,500,000	0	0	0	40,000,000	9,725,000	0
Concord	0	4,600,000	0	0	4,700,000	3,900,000	0
Framingham	0	0	550,000	0	312,000	3,184,000	0
Hudson	0	2,300,000	30,000	0	0	330,000	0
Marlborough East	0	0	5,000	0	3,555,000	0	0
Marlborough West	0	0	0	0	436,000	0	0
Maynard	0	0	160,000	450,000	1,200,000	0	0
Natick	0	0	650,000	0	7,164,000	0	0
Northborough	0	0	0	0	2,200,000	1,440,000	0
Shrewsbury	0	4,000,000	30,000	0	9,000,000	3,000,000	0
Southborough	0	0	0	0	3,670,000	3,500,000	0
Sudbury	0	2,000,000	0	0	11,000,000	3,700,000	0
Westborough	0	6,000,000	180,000	0	5,300,000	5,400,000	0
Lowell	25,400,000	0	0	0	0	46,699,000	67,000,000
ENR Index = 1900 (June 1973)							

*Cost figures developed by consultants for individual towns and do not represent information generated by the Division.

pollution from stormwater runoff channelled through sewers and other conveyances used only for such runoff. The costs of abating pollution from stormwater channelled through combined sewers which also carry sewage are included in Category V. Category VI was added so the survey would provide an estimate of all eligible facility costs, as explicitly required by PL93-243.

DISCHARGE PERMIT PROGRAM

All of the enforcement functions formerly carried out under the implementation schedule have been transferred to the joint Federal-State Discharge Permit Program. This program, formally known as the National Pollutant Discharge Elimination System (NPDES), establishes levels of effluent quality to be maintained at existing treatment facilities and sets forth implementation schedules for discharges which contribute to violations of water quality standards. Discharge permits comprise the vehicle for implementation of water quality management plans. Whereas the basin plan is essentially a strategy document, each permit sets a formal implementation schedule for abatement action. Coordination of basin planning and permit issuance is therefore vital in order to assure effective abatement of pollution in each basin as well as state-wide.

In order to facilitate the issuance of permits, preliminary basin plans have been prepared for several Massachusetts rivers. These documents contain ranking of significant discharges, preliminary load allocations, and abatement priorities based on water quality impact. Discharge permits have been drafted based on the information contained in the preliminary basin plans. These permits could be revised to reflect additional recommendations of the final basin plans.

Each permit contains two portions: effluent limitations, and schedules for corrective actions. The effluent limitations formally establish performance criteria for treatment facilities. Through these limits, the goals of the operation and maintenance program are set. Implementation schedules are included when existing levels of treatment are not adequate to meet water quality goals or where no treatment is being provided. In instances where point source discharges, consisting of facility bypasses, overflows from combined sewer systems, and/or sewer systems with excessive infiltration/inflow, will not be eliminated by the construction of a new waste treatment system, an additional report must be submitted by the permittee. This report, which is usually due within 18 months of the permit issuance date, must contain both short- and long-term abatement plans. Short-term measures require development of a program of system operation to optimize the full potential of the permittee's treatment facilities and sewerage system. The long-term program must be developed for the eventual elimination of these discharges. When the permittee's report has been submitted, the "second round" of permits will establish schedules for implementing the recommendations as approved by the Division and the EPA.

In cases where existing treatment facilities provide insufficient degrees of treatment to meet water quality goals, the effluent limitations portion of the permit requires that present performance levels be maintained while corrective action is undertaken. This assures that conditions do not

worsen in the period leading up to and including construction of a new treatment facility.

Each permit is issued for a period of five years or less. At the expiration of the "first round" permits, new permits reflecting any revised water quality goals or treatment requirements will be issued. The period of time covered by permits in a basin will be determined in part by scheduled revisions to the particular basin plan.

SUASCO RIVER BASIN DISCHARGE PERMIT PROGRAM

Discharge permits have been issued to several municipal dischargers in the SUASCO River Basin. Table VII-3 designates the facilities and gives the dates for the completion of various steps in the abatement program. For the municipal facilities, each permit designates effluent limitations and, in most cases, the date for the completion of a facilities plan. Maynard, in addition to the above deadlines, was given dates for the completion and operation of the upgraded facility presently being constructed. The "second round" of permits will give dates for the completion of upgraded facilities at all municipal facilities.

Of the industries listed in Table III-4, four have discharge permits. Raytheon Corporation of Lowell and Wayland are not on implementation, and their permits are issued until 1980. Corenco Company and North Billerica Company have permits which state that pre-treatment facilities must be completed by December 1974 and that connection to the Billerica municipal facility be accomplished by September 1975. Both companies are within the compliance framework of their permits.

TABLE VII-3
MUNICIPAL DISCHARGE PERMITS¹

SUASCO RIVER BASIN

FACILITY	EXPIRATION DATE	BOD ₅	TOTAL SUSPENDED SOLIDS	FLOW (MGD)	FACILITIES PLAN SUBMITTAL DATE
Billerica	June 1, 1977	30.0	30.0	1.6	---
Concord	June 1, 1977	30.0	30.0	1.0	June 1, 1977
Hudson	July 1, 1977	30.0	30.0	2.0	June 1, 1977
Marlborough East ²	December 1, 1979	5.0	10.0	5.5	---
Marlborough West	June 1, 1977	30.0	30.0	2.0	(3)
Maynard	July 1, 1977	30.0	30.0	1.3	July 1, 1977
Shrewsbury	June 1, 1977	50.0	25.0	1.95	November 30, 1975
Westborough	June 1, 1977	15.0 ⁴	15.0	1.1	May 1, 1977
		30.0 ⁵	30.0	1.1	

¹Effluent limitations: Monthly average in mg/l. All effluents have limit for fecal coliform bacteria of 200/100 ml and total coliform bacteria of 1000/100 ml.

²Ammonia-nitrogen \leq 0.5 mg/l; total phosphorus \leq 1.0 mg/l; dissolved oxygen \geq 7.0 mg/l.

³The Regional Administrator and the Director reserve the right to amend the permit to include: an implementation schedule for construction of nutrient removal facilities and appropriate effluent limitations for such nutrients.

⁴May through September.

⁵October through April.

MUNICIPAL NEEDS AND ABATEMENT PROGRAM

Acton - The town has undergone a great development and population growth over the past twenty-five years (see Table I-1). This growth is projected to greatly increase, as shown in Table VII-1. However, these figures may be exaggerated, as the growth rate of the town seems to be slowing down.

In 1974, the Division conducted a survey on the main streams in the town and found little in the way of water quality problems. Two apartment complexes in the town operate package treatment systems. These systems have not created any known problems to the streams of the town. However, subsurface disposal could create problems in the groundwater of the town, which is their source of potable water. Continuous monitoring of the groundwater by the town health officials is needed to assure that contamination from septic systems and ground-discharging package plants does not occur.

In 1966, an engineering report submitted to the town proposed the construction of a sewage treatment facility with the effluent discharged to the Assabet River in the southern section of town. The report called for the plant to have an initial capacity of 1.0 MGD. The projected flows for 1990 are 4.3 MGD. However, this figure is based on projections that may be too high.

The Town of Acton is designated as part of a 201 facilities planning area which includes Concord, Littleton, and Maynard. The 201 facilities plan will be developed under the 208 planning program of the Metropolitan Area Planning Council (see page 81).

In order to meet the municipal needs of the town, to attain the 1977 water quality goals of this plan, and to proceed toward the realization of the 1983 goals, the Division recommends:

1. The formulation of the facilities plan at the earliest possible date. The plan must address the possible regionalization with the other towns in the 201 planning area. The facilities plan should provide a location for the treatment of the town's septic wastes, which are presently land-applied.
2. A periodic monitoring of surface and groundwaters should be conducted by the town to insure against violations of the established standards.
3. An examination of the expected growth pattern and long-range zoning laws with respect to sewerage needs.

Ashland - The town is under the jurisdiction of the Metropolitan Sewerage District. Consulting engineers, hired by the town, showed ten critical areas which need sewerage. To date, three of those areas have been given service. The town has made application for funds to:

1. build a pumping station at a Fountain Street site;
2. construct a force main for Green Street and Riverview Street;
3. alleviate subsurface disposal problems on Elliot Street, Prospect Street, and Bartlett Road.

The town has two pumping stations: a main station which pumps about 1.0 MGD and a minor station at Bracket Street which pumps one million gallons per month. Presently, the town is installing an interceptor to the Front Street section.

The town is part of the recommended service area designated in the preliminary EMMA Study (see page 79). The main need for the town is expanded capacity of the sewer trunk line. The EMMA Study recommends the construction of these facilities to serve Ashland and other surrounding communities. The SUASCO River Basin Plan endorses and encourages this course of action.

To date, there is no known contamination of the town's water supply wells. Fortunately, these wells are located in a remote area of the town near Hopkinton State Park.

In order to meet the municipal needs of the town, to attain the 1977 goals of this plan, and to proceed toward the realization of the 1983 goals, the Division recommends:

1. The adoption of the EMMA Study recommendations to expand the MSD capacity to serve Ashland and Hopkinton.
2. The sewerage of the remaining seven problem areas as designated by the town's consulting engineers and enabling the expansion to coincide with the expansion of the MSD capacity.
3. Periodic monitoring of the town's water supply by town officials to ensure against contamination.
4. Any industrial development must provide acceptable methods of waste and wastewater disposal.

Berlin - The town has no municipal sewerage system and no public water supply. The population growth was moderate over the period 1950-1970 (see Table I-1) but is projected to increase greatly by the year 2000 (see Table VII-1). The reality of these increases is suspect and probably much too high. The town has periodic groundwater contamination in the area of Berlin Center caused by poor subsurface disposal in a densely populated area. Areas of the town which have potential sewage problems are East Berlin, South Bolton Village, West Berlin, South Berlin, and Berlin Center.

A study of the town's sewerage needs projected a sewage flow of 0.25 MGD for 1985 and a sewage flow of 0.58 MGD for the year 2000. These projections are based upon expected population growth and needed sewerage service areas.

If a treatment facility were to be built, the effluent must be discharged to the Assabet River because of the anti-degradation provision. The Marlborough West Wastewater Treatment Plant discharges to the Assabet River near the southeast section of Berlin. If a sewerage system is deemed necessary for the Town of Berlin, a viable alternative would be a collection system which would transport the wastewater to the Marlborough West facility.

This alternative should be addressed in the preparation of the engineering report of the town's sewage needs.

North Brook, the largest stream in Berlin, drains a major portion of the town and flows into the Assabet River. In 1974, the Division conducted a survey of the Assabet River Basin which included sampling of North Brook. The analysis of the samples shows no water quality problems, indicating that there is no contamination of North Brook by sewage problems. This survey did not include sampling of groundwater.

In order to alleviate any groundwater contamination problems, to properly evaluate the municipal sewage needs, and to protect the surface waters of Berlin, the Division recommends:

1. The formulation of a study of the waste disposal problems of the town.
2. An agreement with the City of Marlborough to allow for the disposal of septic wastes from Berlin at the Marlborough Westerly facility.

Billerica - The town has recently expanded its treatment facility, increasing its capacity to 1.6 MGD. The construction also included the building of sludge-handling facilities. The expanded facility will provide service for approximately 37 percent of the town's population and, in addition, treat the pre-treated wastewaters of two major industries in the area.

The town has tripled its population since 1950, which has created the need for an extensive sewerage system. The town has developed a five-phase expansion of its sewerage system which will sewer 90 percent of the town's population by 1990.

The program to sewer the area of Nutting Lake is 95 percent completed. The Boston Road section of town, which has subsurface disposal problems, will be sewered in the near future. The area of the Town of Chelmsford along Route 4 and the area of the Town of Tewksbury off Whipple Road have been proposed to be sewered to the Billerica municipal facility. This idea will be feasible if adequate capacity is planned at the municipal treatment plant.

The town presently disposes its septic waste at the town landfill but is currently negotiating with the MDC to be allowed to dispose of the septic waste in Wilmington at an MDC sewer site. However, the future expansion of the sewage treatment plant should include the construction of septic waste treatment facilities.

The section of the Concord River to which the municipal plant discharges is currently designated as an effluent limited segment. This designation stipulates that secondary treatment is a sufficient degree of treatment to meet the receiving water classification. As the town expands its sewerage system and increases the quantity of flow to the Concord River, this section of the river may be reclassified as water quality limited and thus require a higher degree of treatment than secondary. The necessity for this change will be determined by the Division by 1977 and will be included in the "second round" of discharge permits.

In order to meet the municipal needs of the town, to attain the 1977 goals of this basin plan, and to proceed toward the realization of the 1983 goals, the Division recommends:

1. The continuation of the 20-year, five-phase master sewerage plan.
2. The disposal of septic wastes at the MDC sewer in Wilmington until a septic waste treatment facility can be constructed at the municipal sewage treatment plant.
3. Formal agreement with the towns of Chelmsford and Tewksbury for the sewerage of designated areas to the Billerica municipal facility. The agreement should include the annual operating cost to be shared proportionally by the three communities.
4. The recognition of the possible need for advanced waste treatment as plant capacity is extended.

Boxborough - The town lies partly within the SUASCO River Basin and is typical of a small New England town. Its proximity to Interstate Route 495 will nurture some development and population growth. The town is composed of small clusters of population and is served by subsurface disposal systems. This method of disposal is adequate for the time frame of this plan.

The Division recommends the following:

1. Periodic monitoring of the individual subsurface disposal systems by town officials.
2. An agreement for the proper location of the disposal of septic wastes.
3. Any industrial development must provide adequate and approved methods of disposal of waste and wastewater.

Carlisle - The town has no public sewerage system at the present time with all disposal accomplished by individual on-lot systems. The projected population growth rate (see Table VII-1) for the year 1990 is phenomenal. The town is on the outlying rim of the Greater Boston megalopolis and could be an area for heavy population growth. However, the town zoning laws require that a building lot be a minimum of one acre. With this zoning law and the indication of the town to limit its growth, the population growth seems exaggerated. Studies have shown that, even with a rapid growth rate by 1990, the estimated sewage flows for the most densely populated area would be less than 0.2 MGD. With no foreseeable subsurface disposal problems, a municipal sewerage system is not presently planned for the town.

To understand and have the capability to handle the future municipal needs for the Town of Carlisle, the Division recommends:

1. The establishment of a municipal sewerage needs committee to develop a

sewage disposal program for the town.

2. An agreement made with the Town of Concord for the disposal of all septic wastes from the town upon completion of the upgraded Concord facility.

Concord - The town operates a sewerage system and treatment plant which serves approximately 5,600 persons, about one-third of the town's population. The present average flow of the plant is 0.8 MGD. The sewerage system serves the center of town along the Main Street area.

The town has had some industrial development, but the zoning laws will keep industrial expansion to a minimum. The town's population is projected (see Table VII-1) to increase substantially to about 25,000 persons by the year 1990. This increased population will put further demands on the already existing municipal needs.

An engineering report contracted by the town shows three major sewerage needs that are of immediate importance:

1. The need to repair the sewer system to reduce infiltration/inflow. This program has been partially completed.
2. The need to extend the sewer system to those areas where unfavorable subsoil conditions and high groundwater levels in low-lying areas are producing on-lot disposal problems.
3. The need to improve and expand the sewage treatment plant.

The report presented a planned sewerage expansion program to be completed in four phases. The first phase would extend service to the severe problem areas of the Riverdale area, the Laurel Street area, and the Concord-Carlisle High School. The report recommends the construction of an advanced waste treatment plant which would have the capability of expanding its capacity into a regional facility serving towns in the surrounding area.

The projected sewered population at the completion of the four phases of expansion would be 14,000 persons by the year 1995. The average sewage flow would be 2.2 MGD. The 1974 municipal needs survey (Table VII-2) shows a substantial expenditure for the realization of the expansion of the sewerage system.

Regional considerations are important when assessing the future program for the Town of Concord. Numerous regional proposals have been presented, each with a different combination of neighboring towns and with various treatment plant locations. The regional alternative for the Concord area is a viable avenue of study.

The town is designated as a 201 facilities planning area which includes Acton, Littleton, and Maynard. The 201 facilities plan will be developed under the 208 planning (see page 81) program of the Metropolitan Area Planning Council.

In order to meet the municipal needs of the town, to attain the 1977 water

quality goals of this plan, and proceed toward the realization of the 1983 goals, the Division recommends:

1. The construction of the treatment facility as proposed by the town's engineering consultant. The facility should be designed so that expansion can be made to accommodate areas designated by the 201 facilities plan.
2. The upgraded treatment facility should have facilities to treat septic wastes from unsewered areas of the town and surrounding communities.
3. The areas of town which have immediate need for sewerage service should have systems constructed to coincide with the completion of the upgraded and expanded treatment facility.
4. The evaluation of the effects upon the water quality of the Concord River from the extension of the outfall to the river.

Framingham - The town is under the jurisdiction of the Metropolitan Sewerage District. Approximately 85 percent of the town's 64,000 people are served by the MSD system. The town has a moratorium against future connections to the collection system because of capacity limitations of the trunk lines.

The Edmonds Road area in the northwest section of town is the main unsewered area in Framingham. This section cannot be sewered until the capacity of the MSD system is increased. The main need is for a relief trunk line for the Framingham and Ashland areas. Also, the town needs a pumping station to expand its sewerage capacity.

An enlarged pumping station was completed in 1974 which serves the Saxonville area of Framingham. This station alleviated the overflow problems of the old pumping station, which periodically discharged to the Sudbury River.

Urban runoff problems found in the town will be evaluated in the 208 areawide waste treatment management program of the Metropolitan Area Planning Council.

In order to meet the municipal needs of the town, to attain the 1977 water quality goals of this plan, and to proceed toward the realization of the 1983 goals, the Division recommends:

1. The construction of a relief trunk sewer to serve Framingham and the surrounding areas. The construction of this system is in accordance with the EMMA Survey proposals (see page 79).
2. The hiring of an engineering consultant to investigate subsurface disposal problem areas and inflow/infiltration problems.
3. Periodic monitoring of subsurface disposal systems by town officials to assure that ground and surface waters are not contaminated.
4. Any industrial development must provide adequate and approved disposal and treatment of wastes and wastewater.

Hopkinton - The town is presently serviced entirely by subsurface disposal systems. There are known disposal problems in the center of town. The town is adjacent to Interstate Routes 495 and 90, which will promote considerable industrial development. The town undertook an engineering study of the town's sewerage needs. Any present or future need for a central sewerage system can be facilitated by the recommended extension of the MSD system through Ashland and into Hopkinton.

To facilitate the municipal needs of Hopkinton and to assure implementation of a total water quality management plan, the Division recommends:

1. The extension of the MSD system to serve the town, as outlined in the EMMA Study, at such a time when studies prove the need for a central system.
2. The treatment of septage waste at a proper location, either a municipal treatment plant or the MSD sewer.
3. Periodic monitoring of subsurface disposal systems by town officials to assure that ground and surface waters are not contaminated.
4. Any industrial development must provide adequate and approved disposal and treatment of wastes and wastewater.

Hudson - The town presently has a municipal sewerage system which serves 10,000 of the 16,000 persons in Hudson. The sewage treatment plant has a capacity of 2.0 MGD, which is sufficient until 1980. As the sewerage system is extended to the eastern section of town and as the population increases (Table VII-1), the average daily sewage flow is expected to be 3.1 MGD by the year 1990. Although the plant has the capacity to handle the flows through 1980, the degree of treatment is not adequate with respect to the water quality standards for the Assabet River.

In order to meet the municipal needs of the town, to attain the 1977 water quality goals of this plan, and proceed toward the realization of the 1983 goals, the Division recommends:

1. The facilities plan, required by the discharge permit program to be submitted by June 1, 1977, present plans for the construction of an advanced waste treatment plant. The plant should be designed to accommodate the projected flows for the year 2000. The facilities plan should provide for the construction of a septage-handling system to treat the septic wastes from the unsewered areas of town and surrounding communities. Also, the facilities plan should determine the proper method and location for the disposal of residual wastes. The plan is studying the feasibility of treating wastewater from portions of Berlin and Bolton.
2. The areas of town which have immediate need for sewage service should have systems constructed to coincide with the completion of the upgraded and expanded treatment facility.
3. Any industrial development must be accompanied by proper and approved methods of waste disposal.

Table VII-2 shows the estimated expenditure to fulfill the municipal needs of the Town of Hudson. These figures appear low because of the possibility of entire reconstruction of the plant rather than additions to the present system. Also, the expenditure shows only a minimal expansion of the service system. The projected expansion would be more costly than that shown.

Lincoln - The town is serviced entirely by subsurface disposal systems. Lincoln has large-lot zoning which should facilitate compliance with the subsurface disposal code. The town foresees little growth, probably less than that shown in Table VII-1.

An engineering study conducted for the Greater Metropolitan Boston Area projected possible disposal problems in the area of town near Hanscom Air Force Base between Old Bedford Road and New Great Road. The study suggests that if a central sewerage system is deemed necessary, either a small package plant be built or the sewage be pumped to Concord. An in-depth report is needed to study this area.

The Division recommends the following program for Lincoln:

1. An intensive study to assess the sewerage needs of the town, especially the above-mentioned area near Hanscom Air Force Base.
2. Periodic monitoring of the subsurface disposal systems by town officials to ensure against possible contamination of ground and surface waters.
3. Designation of a proper site for septage disposal.

Littleton - The town is presently served by subsurface disposal systems. The predicted population growth and the town's proximity to Interstate Route 495 will provide increased sewerage needs for the town. Development of apartment complexes in the town and areas along Routes 110, I-495, and 119 are areas which could benefit from the construction of a central sewerage system. The northwest area of town may be sewered to the proposed Chelmsford sewage treatment plant. This would include the area around Forge Pond, a major recreational area. This proposal is presented in The Merrimack River Water Quality Management Plan.

The Town of Littleton is designated as part of the 201 facilities planning area which includes Acton, Concord, and Maynard. The 201 facilities plan will be developed by the 208 areawide waste treatment management program of the Metropolitan Area Planning Council (see page 81).

In order to meet the municipal needs of the town, to attain the 1977 water quality goals of this document, and to proceed toward the 1983 goals, the Division recommends:

1. The formulation of the facilities plan at the earliest possible date. The plan must address the possible regionalization with the other towns in the planning area. The facilities plan should provide a location for the treatment of the town's septic wastes.

2. The expected growth pattern and long-range zoning laws should be examined.

3. A periodic monitoring by town officials of surface and ground waters and subsurface disposal systems should be conducted.

Marlborough - The city is presently serviced by two sewage treatment facilities. The western section of the city is serviced by a secondary treatment facility which discharges to the Assabet River. The plant has a capacity of 2.0 MGD and presently treats a flow of about 1.3 MGD. The western section of the city has considerable industrial development with much of the industrial wastewater treated at the facility. The Town of Northborough has begun construction of a sewerage system which will convey sewage to the westerly treatment plant. To date, a minimal flow from Northborough is being treated, but the flow to the plant is expected to be 800,000 GPD. Because of its present undercapacity, the treatment plant is producing a very high quality effluent. As flow to the plant increases, the treatment needs will increase. This plant, like others on the Assabet River, will need advanced waste treatment.

The center and eastern sections of the city are serviced by a facility located at the headwaters of Hop Brook. In December 1973, an advanced treatment facility was constructed on the site of the older, outdated plant. The need for an extremely high degree of treatment at this plant is necessitated by the extremely eutrophic conditions of the four millponds located downstream of the plant. During the summertime, the vast majority of flow entering the first millpond is from the treatment plant effluent. The plant's capacity is 5.0 MGD, and average flow is approximately 3.5 MGD. Numerous apartment complexes have been constructed in Marlborough, greatly increasing the population and sewerage needs of the city.

Stream analysis of Hop Brook in 1973, prior to the construction of the advanced waste treatment plant, showed highly polluted and eutrophic conditions with extreme amounts of algal activity. The Division has been conducting a monitoring program of the easterly treatment plant and the entire course of Hop Brook. The treatment facility is performing well within the effluent limits set by the NPDES permit (NH_3 - 0.5 mg/l; Total P - 1.0 mg/l; D.O. - 7.0 mg/l). Preliminary indications show some improvement of the water quality of Hop Brook, but the continuation of excessive algal activity and dissolved oxygen variations. Presently, the plant is utilizing phosphorus removal and nitrification as the mode of advanced treatment. Preliminary indications are that this will not be adequate to attain the proposed B classification. Processes such as denitrification and the use of carbon adsorption columns may be necessary along with management (e.g., dredging bottom deposits) of the four millponds. Continued monitoring and engineering studies are necessary and highly recommended by this plan. A possible alternative for the easterly plant would be the piping of the discharge to the Assabet River. This idea has been proposed in the past and is worthy of consideration.

In order to meet the municipal needs of the city, to attain the 1977 water

quality goals of this plan, and to proceed toward the realization of the 1983 goals, the Division recommends:

1. The initiation of an implementation schedule, as stated in the NPDES permit, for the construction of nutrient-removal facilities at the westerly plant.
2. An agreement be made with the Town of Northborough on the scheduled sewer expansion of both communities.
3. Agreements made with the proper parties as to the disposal of septage wastes at the treatment plants. This can include surrounding communities which lack disposal sites.
4. Any industrial development in the town must provide adequate pre-treatment of wastewater to enable the treatment plants to properly handle the wastewater. The treatment of industrial wastewater at the municipal facilities is contingent upon the capacity of the treatment facilities to properly handle the increased loadings.
5. The expansion of the monitoring program of the easterly treatment plant and Hop Brook. The Division is establishing an in-depth research project to determine the most adequate treatment method.
6. Periodic monitoring of subsurface disposal systems and public water supplies by town officials.

Maynard - The town is in the process of completing the construction of a conventional activated sludge facility with a chlorination system. The plant is expected to be put into operation in the Fall of 1975 and have an average flow of 1.1 MGD. The new plant will service approximately 90 percent of the town's population of 9,900. The plant will have on-site incineration of sludge.

The town has recently completed an extension and rehabilitation of the service system, but needs to replace two antiquated pumping stations. The unsewered sections of the town have the typical, periodic subsurface disposal problems that occur during periods of rain. These problems, to date, are not critical but should be monitored to insure against the contamination of ground and surface waters. The septic waste from the subsurface systems is taken out of the town and disposed of at a site in Acton.

The Town of Maynard is designated as part of a 201 facilities planning area which includes Acton, Concord, and Littleton. The 201 facilities plan will be developed by the 208 areawide waste treatment management program of the Metropolitan Area Planning Council (see page 81).

In order to meet the municipal needs of the town, to attain the 1977 water quality goals of this plan, and to proceed toward the realization of the 1983 goals, the Division recommends:

1. The engineering report required by the NPDES permit should be coordinated with the 201 facilities planning to be conducted by the MAPC.
2. The construction of septage treatment facilities at the municipal treatment plant.
3. The construction of two pumping stations to replace the present outdated facilities.
4. Periodic monitoring of the subsurface disposal systems by town officials.
5. The proper and approved treatment of any industrial waste and wastewater.

Natick - The Town of Natick is under the jurisdiction of the Metropolitan Sewerage District. The sewered population is 23,250 persons of the town's population of 31,000. The average daily sewage flow during dry weather is 2.68 MGD. However, the system has extreme infiltration/inflow problems which add as much as 4.5 MGD during rainy periods. The town has a program which is attempting to alleviate this problem, and it hopes to receive sufficient funding to continue the rehabilitation of the system.

The area of South Natick is unsewered and in need of the construction of a collection system to sewer the problem areas. The MSD has put a ban on further sewer connections to Natick and the surrounding areas. The ban was imposed because of lack of capacity of the trunk line serving the Natick area.

The town feels that an engineering study of its sewerage problems is mandatory. The town utilizes groundwater for its public water supply. The groundwater has not been contaminated by subsurface disposal problems, but proper measures must be taken to insure that such does not occur.

In order to meet the municipal needs of the town, to attain the 1977 water quality goals of this plan, and to proceed toward the realization of the 1983 goals, the Division recommends:

1. The construction of a relief trunk sewer to serve Natick and surrounding areas. The construction of this system is in accordance with the EMMA Study proposals (see page 79).
2. The town should hire an engineering consultant to further investigate its subsurface disposal problems and set up a program to insure the protection of town groundwater wells.
3. The continuation of the program of sewer reconstruction to alleviate inflow/infiltration problems.
4. The assurance by the town of a proper location for septage disposal.
5. Examination of urban runoff problems and proposed solutions.

Northborough - The town is currently constructing a sewerage collection system for a portion of the town's population. The sewage will be pumped to the Marlborough West Sewage Treatment Plant. An industrial park adjacent to Interstate Route 290 is the only section of town sewerred to date. Initial areas to be sewerred are the area around the center of town and areas along State Route 135. The continuation of the initial phase of the construction is being delayed while the town awaits federal funding. Future expansion of the sewerage system is expected to handle the large majority of population of the town.

The projected sewage flow for the initial phase on construction is 0.8 MGD. The Marlborough West facility has an initial design capacity of 2.0 MGD. The addition of the flow from Northborough will put the plant at its design capacity. The plant is designed to be expandable to 6.0 MGD. The projected flow from Northborough for the year 2000 is 3.2 MGD. This projection, according to the Central Massachusetts Regional Planning Commission's report, Regional Sewerage Study, Phase One, is based upon projected population growth and future planned development in the Route 9-Route 20 interchange area and industrial development along Interstate Route 290.

Table VII-2 shows the estimated cost given in the municipal needs survey. The needed expenditure is for the construction of a collection system and pumping stations. This expenditure will increase as the system is expanded.

In order to meet the municipal needs of the town, to attain the 1977 water quality goals of this plan, and to proceed toward the realization of the 1983 goals, the Division recommends:

1. An agreement be made with the City of Marlborough on the scheduled sewer expansion of both communities.
2. An agreement with the City of Marlborough to allow the septic wastes from the unsewered portions of Northborough to be disposed of at the Marlborough West facility.
3. An updating of the sewerage needs study for the town and the establishment of an updated schedule for construction of the sewerage system.
4. Any industrial development must provide proper methods of disposal of wastewater.

Shrewsbury - The town presently has a sewage treatment facility which discharges, through a 2.5 mile-long pipe, to the Assabet River. The point of discharge is only one-half mile downstream from the Town of Westborough Sewage Treatment Plant discharge. The combined effect of the two effluents magnifies the need for a comprehensive plan to achieve the water quality goals established for the Assabet River. The effluents from the two plants represent a large percentage of the flow present in the upper portion of the Assabet River and, therefore, create the need for the assurance of a high quality effluent.

The sewerage system presently serves approximately 12,000 people of a population of 21,900. The average flow of the plant is 1.3 MGD, which is close to the design capacity of the facility. The facility utilizes a secondary treatment process, and the effluent from the plant is not of adequate quality for the Assabet River to meet its assigned B1 classification. The river downstream from the point of discharge is in a "U" condition.

Sewerage systems are presently being connected to the areas of town along the eastern shore of Lake Quinsigamond. The Rolfe Avenue and Edgewater Avenue areas will need relief of the existing interceptors and expanded capacity of the pumping stations. Future service is also planned for the northern and southern extremities of the town by the year 2000. A section of southwest Shrewsbury will be connected to the Upper Blackstone Water Pollution Abatement District.

According to the CMRPC's report, Regional Sewerage Study, Phase One, the projected sewerage flows are 2.7 MGD by 1980, 3.6 MGD by 1985, and 4.8 MGD by 2000. It is felt that these are realistic figures in accordance with the present sewerage plan.

In order to meet the municipal needs of the town, to attain the 1977 water quality goals of this plan, and to proceed toward the realization of the 1983 goals, the Division recommends:

1. The engineering report, required by the NPDES permit to be completed by November 30, 1975, should present plans for the construction of an advanced waste treatment facility. The facility should be designed to have the capacity of the year 2000 projected flows. The report must address the alternative of a regional facility in cooperation with the Town of Westborough because the two towns have been designated as 201 facilities planning areas. The facilities plan should provide for the construction of a septage handling system to treat the septic wastes from the unsewered sections of the planning area. Also, the report should determine the proper method and location for the disposal of residual wastes. The report should be completed by November 1, 1976.
2. The areas of the town which have an immediate need for service should have sewerage systems constructed to coincide with the completion of the upgraded and expanded treatment facility.
3. Any industrial development must provide an approved method for the disposal of wastewater.

The estimated costs given in the municipal needs survey are shown in Table VII-2. The table shows considerable expenditure for the expansion of the sewerage system, which is in accordance with the schedule set forth in this plan. The estimated cost for the construction of advanced waste treatment appears to be low.

Southborough - The town is presently serviced entirely by subsurface disposal systems. The town has experienced periodic disposal problems which are typical during rainstorms in areas with a high groundwater table. The

town is composed of scattered population centers. This would make the construction of one central sewerage system extremely expensive. If a sewerage system is needed in the future, the northern section of the town could be serviced by the Marlborough East Sewage Treatment Plant; the southern section in the Village of Cordaville could be serviced by the MSD system; the western area along Route 9, which is a prime industrial development area, could possibly be serviced by the recommended Westborough-Shrewsbury facility or could be included in the MSD system.

Table VII-1 shows that the town is projected to have a substantial increase in population by the year 2000. This increase will put added stress on the above-mentioned areas of town to properly utilize individual subsurface disposal. A sewerage feasibility study has been conducted for Southborough. This plan recommends that a study be compiled for the entire town which will identify the proper sewage disposal methods and land use controls for the expected increase in population.

Much of the town is located adjacent to the MDC-Sudbury reservoir system. This location necessitates the continual monitoring of the subsurface disposal systems to insure against contamination of the groundwater and of tributaries to the reservoir.

The town has stopped operation of its landfill and is planning to construct a total recycling plant. The construction of this plant is endorsed by this basin plan during this time of solid waste disposal holocaust.

In order to meet the municipal needs of the town, to attain the 1977 goals of this plan, and to proceed toward the realization of the 1983 goals, the Division recommends:

1. The completion of an engineering report of the town's sewerage needs.
2. Periodic monitoring of subsurface disposal systems by town officials; more frequent monitoring for those near the Sudbury Reservoirs.
3. If a sewerage system is needed, that the recommendations of the EMMA Study (page 79) be carefully considered and that careful study be given to sewerage the section of town capable of being served by gravity to the Marlborough East facility.
4. The construction of the total recycling plant at the earliest possible date.
5. Industrial development be accompanied by proper and approved methods of disposal of waste and wastewater.

Stow - The town is serviced entirely by subsurface disposal systems. The population growth (Table VII-1) is projected to be moderate over the next twenty years. The town can continue to be adequately served by subsurface systems because of the zoning by-laws and the moderate growth in population. No central sewerage system is foreseen for a minimum of twenty years.

The Division recommends the following program for the Town of Stow:

1. Periodic monitoring of subsurface disposal systems to assure against contamination of surface and ground water.
2. An agreement be made with the Town of Hudson for septage disposal.
3. Any industrial development must provide adequate methods of treatment and disposal of waste and wastewater.

Sudbury - The town does not have a municipal sewer system and is serviced entirely by subsurface disposal systems. The town has experienced phenomenal growth since 1950 (see Table I-1) and is expected to continue this population boom (see Table VII-1). The town, in cooperation with the Town of Wayland, is constructing a septage treatment system which will treat the septic wastes of the two communities. The need for such a system developed when the Metropolitan Sewerage District imposed a moratorium on the disposal of septic wastes to the MSD sewers. The ban was needed because of the limited capacity of the MSD collection system. The disposal system is scheduled to be completed by late 1976 or early 1977 at a cost of 0.5 million dollars. The system will utilize biological treatment, land application of the effluent, and the disposal of the residual waste at the town's sanitary landfill. The capacity of the landfill is projected to be sufficient to handle the town's solid wastes for twenty-five years. The capacity of the disposal system will be sufficient until 1985, at which time a report of the town's sewerage needs study will be completed. The septage facility will be able to handle septic wastes from surrounding communities until 1985.

In order to meet the municipal needs of the town, to attain the 1977 water quality goals of this plan, and to proceed toward the realization of the 1983 goals, the Division recommends:

1. Periodic monitoring by town officials of the surface and ground waters of the town to assure that the septage disposal treatment facility and individual subsurface disposal systems are not contaminating ground and surface water.
2. The formulation of an agreement with the surrounding communities which will utilize the septage disposal system.
3. No treatment plant discharge to the Sudbury River, even if the sewerage needs report shows the necessity for a central sewerage system. The naturally occurring dissolved oxygen problems of the Sudbury River (page 27) and the unique hydraulics of the river dictate that a treatment plant should not discharge to the Sudbury River. The sewerage needs study should investigate alternative locations for the discharge of treatment plant effluent.
4. Any industrial development must be accompanied by proper and approved methods of waste and wastewater disposal.

Wayland - The town is serviced by subsurface disposal systems and has made an agreement with the neighboring Town of Sudbury to construct a septage treatment system. The need for such a system arose when the Metropolitan Sewerage District imposed a moratorium on the disposal of septic waste at the MSD sewers. The disposal will be completed by late 1976 or early 1977 at a cost of 0.5 million dollars. The system will utilize biological treatment, land application of the effluent, and disposal of the solid waste at a landfill. The capacity of the disposal system is projected to be sufficient until 1985, at which time a report will assess the town's sewerage needs. The septage facility will be able to handle septage wastes from surrounding communities until 1985.

Two areas of the town, the Cochituate area near Routes 30 and 27 and the center of town along U.S. Route 20, have been shown to have poor soil capabilities because of their closeness to the floodplain. Periodic problems occur and should be investigated in the sewerage needs report.

The town has experienced phenomenal growth since 1950, as shown in Table I-1. This growth rate has been projected to continue (Table VII-2), but this trend is very controversial. There has been a decline in building over the past five years, and the population has actually decreased in the past year. The population of many suburban towns seems to be leveling off at a much faster rate than that projected in population surveys.

In order to meet the municipal needs of the town, to attain the 1977 water quality goals of this plan, and to proceed toward the 1983 goals, the Division recommends:

1. Periodic monitoring of the surface and ground waters to assure that the septage disposal facility and individual subsurface disposal systems are not contaminating these waters.
2. The formulation of an agreement with the surrounding communities which will utilize the septage disposal system.
3. Any industrial development must be accompanied by proper and approved methods of waste and wastewater disposal.
4. No treatment plant discharge to the Sudbury River, even if the sewerage needs report shows the necessity for a central sewerage system. The delicate ecosystem of the Sudbury River (see page 27) dictates that a sewage treatment plant should not discharge to the river. The sewerage needs study should investigate other locations for the discharge of treatment plant effluent.

Westborough - The headwaters of both the Assabet and Sudbury Rivers are located in this town. This situation dictates that a comprehensive and highly regulated sewage disposal program be planned and efficiently maintained. A comprehensive program is needed to achieve the water quality goals established for the upper portions of the Assabet and Sudbury Rivers.

The town presently operates a municipal sewage treatment facility which serves approximately 8,000 people of a population of 13,000. The present flow at the plant is 0.9 MGD, approximately the design capacity. The collection system has extreme inflow/infiltration problems which cause periodic overloading of the plant's capacity. The plant discharges directly to the Assabet River, 1.5 miles downstream of the stream's headwaters. This location, coupled with a very low flow, necessitates advanced waste treatment to meet the assigned water quality classification of the Assabet River.

The plant is an extended aeration facility, including seasonal use of sand filter beds. The quality of the effluent is not adequate for the Assabet River to meet its B1 classification. The river downstream from the plant is in a U condition. This section has dissolved oxygen problems, very high levels of nutrients, algal problems, and periodic coliform bacteria problems.

Existing areas of the town that need to be sewered, the projected growth rate, and increasing areas of industrial zoning and construction contribute to the immediate need for an expanded municipal sewerage system. Interceptors are needed along Mill Road to serve the southwest portion of the town. Also, the areas of South Street and Flanders Road need sewerage, especially an area off Flanders Road which is currently being developed as an industrial park. The proper disposal of wastes in this area is critical because of its proximity to the remaining sections of Cedar Swamp, which is the headwaters of the Sudbury River.

The projected sewage flows for the town, according to the Central Massachusetts Regional Planning Commission's report, Regional Sewerage Study, Phase One, are 1.2 MGD by 1980 and 2.9 MGD by 2000. It is felt that both these figures are conservative and may be reached at an earlier date.

In order to meet the municipal needs of the town, to attain the 1977 water quality goals of this plan, and to proceed toward the realization of the 1983 goals, the Division recommends:

1. The facilities plan, required by the NPDES program to be completed by May 1, 1977, should present plans for the construction of an advanced treatment facility. The facility should be designed to have the capacity of the year 2000 projected flows. The facilities plan must study the construction of a regional facility in cooperation with the Town of Shrewsbury because both communities have been designated as facilities planning areas. The facilities plan should provide for the construction of a septage handling system to treat the septic wastes from the unsewered sections of the planning area. Also, the facilities plan should determine the proper method and location for the disposal of residual wastes. The facilities plan should be completed at the earliest possible date. November 1, 1976, is a reasonable date for completion. The date should coincide with the planning being conducted for the Town of Shrewsbury.
2. The areas of town which have immediate need for service should have sewerage systems constructed concurrently with the completion of the up-graded and expanded treatment facility.

3. Any industrial development must provide an approved method for the disposal of wastewater. Discharges to the Cedar Swamp section of the Sudbury River will not be allowed because that section of stream is designated as anti-degradation.

The estimated costs given in the above-mentioned municipal needs survey are shown in Table VII-2. The survey shows the anticipation of the construction of an advanced treatment facility and an extensive sewerage expansion program. The results of the survey are in accordance with the recommended plan for the town.

The pollution abatement program outlined above varies according to the individual municipal sewerage needs. Table VII-4 shows a summary of the recommended action for the individual communities, including a tentative timetable for the various steps in the pollution abatement program. Communities not shown in Table VII-4 do not need abatement action during the design life of this plan.

TABLE VII-4

SUMMARY OF ABATEMENT PROJECTS

SUASCO RIVER BASIN

<u>COMMUNITY</u>	<u>PROJECT</u>	<u>TENTATIVE COMPLETION DATE</u>
Acton	Facilities Plan	January 1, 1978
Ashland	Expansion of MSD system	July 1, 1993
Billerica	Expansion of sewerage system Upgrade sewage treatment plant	January 1, 1990
Concord	Facilities Plan Expansion of sewerage system Upgrade sewage treatment plant	January 1, 1978 January 1, 1979 January 1, 1979
Framingham	Expansion of MSD system	January 1, 1982
Hopkinton	Expansion of MSD system	July 1, 1993
Hudson	Facilities Plan Upgrade sewage treatment plant	January 1, 1977 January 1, 1980
Littleton	Facilities Plan	January 1, 1978
Marlborough	Upgrade sewage treatment plant	January 1, 1980
Maynard	Facilities Plan Upgrade sewage treatment plant	January 1, 1978 January 1, 1981
Natick	Expansion of MSD system	January 1, 1982
Northborough	Expansion of sewerage system	January 1, 1978
Shrewsbury	Facilities Plan Upgrade sewage treatment plant	November 1, 1976 November 1, 1979
Sudbury	Septage treatment facility	June 1, 1977
Wayland	Septage treatment facility	June 1, 1977
Westborough	Facilities Plan Upgrade sewage treatment plant	November 1, 1976 November 1, 1979

VIII. FUTURE WATER QUALITY

The primary goal of this water quality management plan is to outline a program which will result in the attainment of the water quality use classifications designated in Section II of this document. The reclassifications are shown in Figure VIII-A. The program is designed to proceed toward fulfillment of the 1983 goal of all fishable/swimmable waters, a goal which is reasonably attainable in the SUASCO River Basin. This basin plan proposes that extensive work be undertaken in order to solve the water quality problems. The work includes the examination of facilities planning areas, the construction of advanced sewage treatment plants, and the expansion and enlargement of sewer lines. These and other projects must be accomplished before the waters of the SUASCO River Basin can attain their proposed water quality.

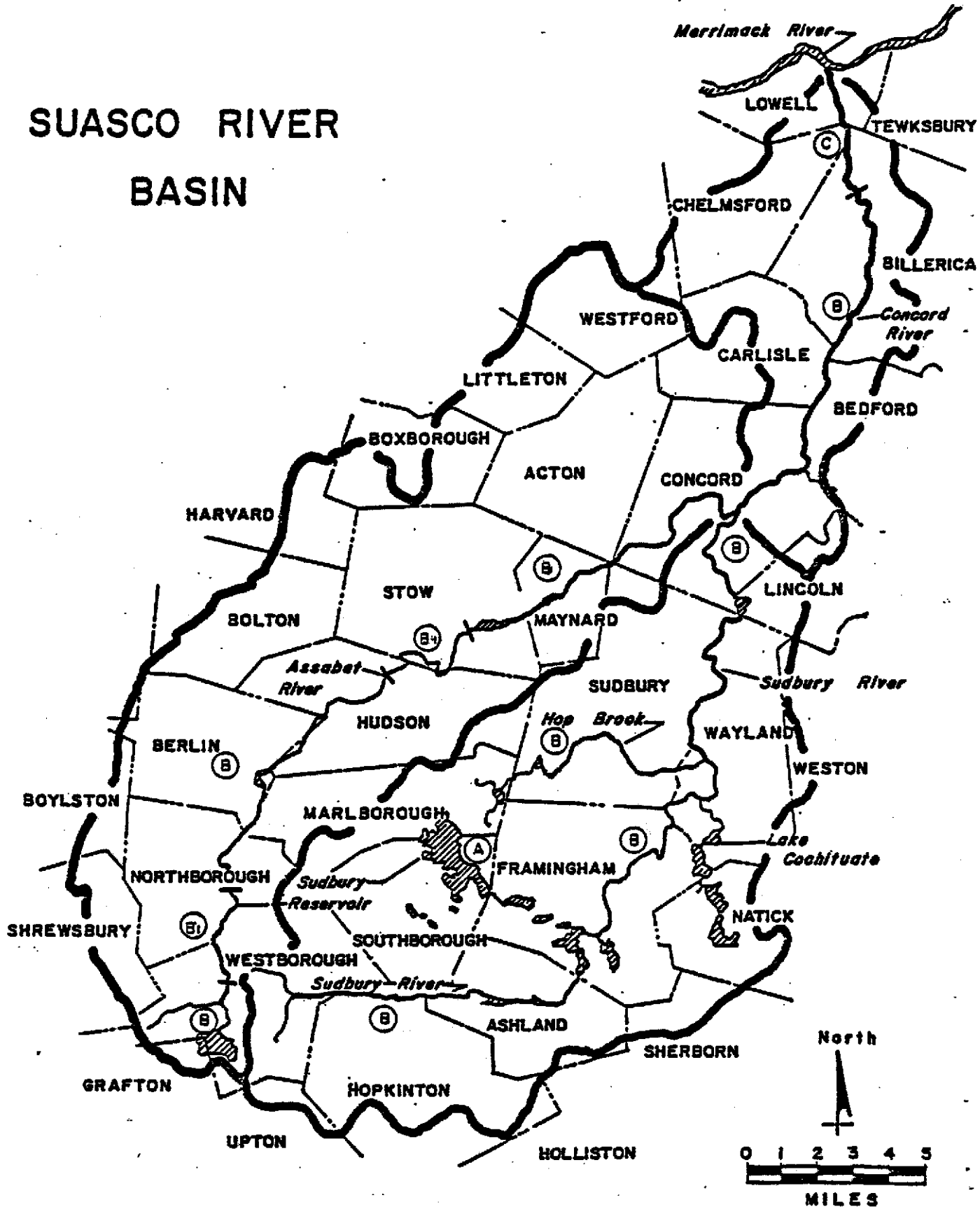
With the completion of the program outlined in this basin plan, some water quality problems will remain. Urban runoff problems will be investigated by 208 studies, but the solutions will be long-term projects. The Sudbury River, in the areas of Ashland and Framingham, is subject to pollution from urban runoff and the eventual control is beyond the time frame of this plan. Combined sewer overflows, as found in the City of Lowell, will be corrected under long-term programs. The waters of Hop Brook will not attain Class B quality because of its unique hydraulic characteristics. The research and monitoring programs proposed in this plan will address various solutions to attaining the desired water quality of Hop Brook.

Other water quality problems will be extremely difficult to properly solve. For decades, improperly treated wastes have been discharged to the rivers, with the accumulation of extensive benthic deposits in the stream beds. The release of elements in the benthos will have a long-term effect on the water quality of the streams. Eutrophic conditions will continue, supplied with nutrients from benthic deposits and non-point sources. The eutrophic conditions will be lessened with control of non-point sources, treatment plants, and the equilibrium of benthic deposits.

The wetlands, which extensively border the rivers in the basin, will cause dissolved oxygen depressions and contribute substantial levels of coliform bacteria. These conditions are believed to be the result of natural conditions and, according to the Water Quality Standards, Regulation III, General Provision 8, "...Water Quality Standards do not apply to conditions brought about by natural causes..." Thus, a river can meet its assigned classification even with periodic water quality violations.

The waters of the SUASCO River Basin will be vastly improved with the implementation of the program recommended in this basin plan. The continuing planning process of the Division will address those aspects of water quality management needed to enhance the water quality of the SUASCO River Basin.

SUASCO RIVER BASIN



WATER USE CLASSIFICATIONS

FIGURE VIII-A

IX. RELATIONSHIP WITH OTHER PLANS

The formulation of this document was accomplished by coordinating the many facets of planning of pollution abatement which have been developed by various agencies, communities, and private companies. The Division has formulated interim basin plans for those projects which had an immediate need for abatement action. Regional planning agencies within the basin have prepared sewerage plans for their member communities. A major study is presently underway which is addressing the sewerage needs of the Boston Harbor-Eastern Massachusetts Metropolitan Area. Individual communities have hired engineering consultants to formulate the proper method to meet the sewerage needs of the community. The following is a discussion of these and other aspects of the total planning effort and how each aspect applies to the formulation of the SUASCO River Basin Water Quality Management Plan.

INTERIM BASIN PLANS




The need for interim plans arose from the Federal law which states that before any monies could be designated for a pollution abatement project, a basin plan must be submitted for the project. In order that the construction of a project not be delayed while a plan for an entire basin was being produced, the Federal government allowed the submittal of an interim plan which would deal only with the particular project. Three such plans for communities within the SUASCO basin were submitted to and approved by EPA. The plans were:

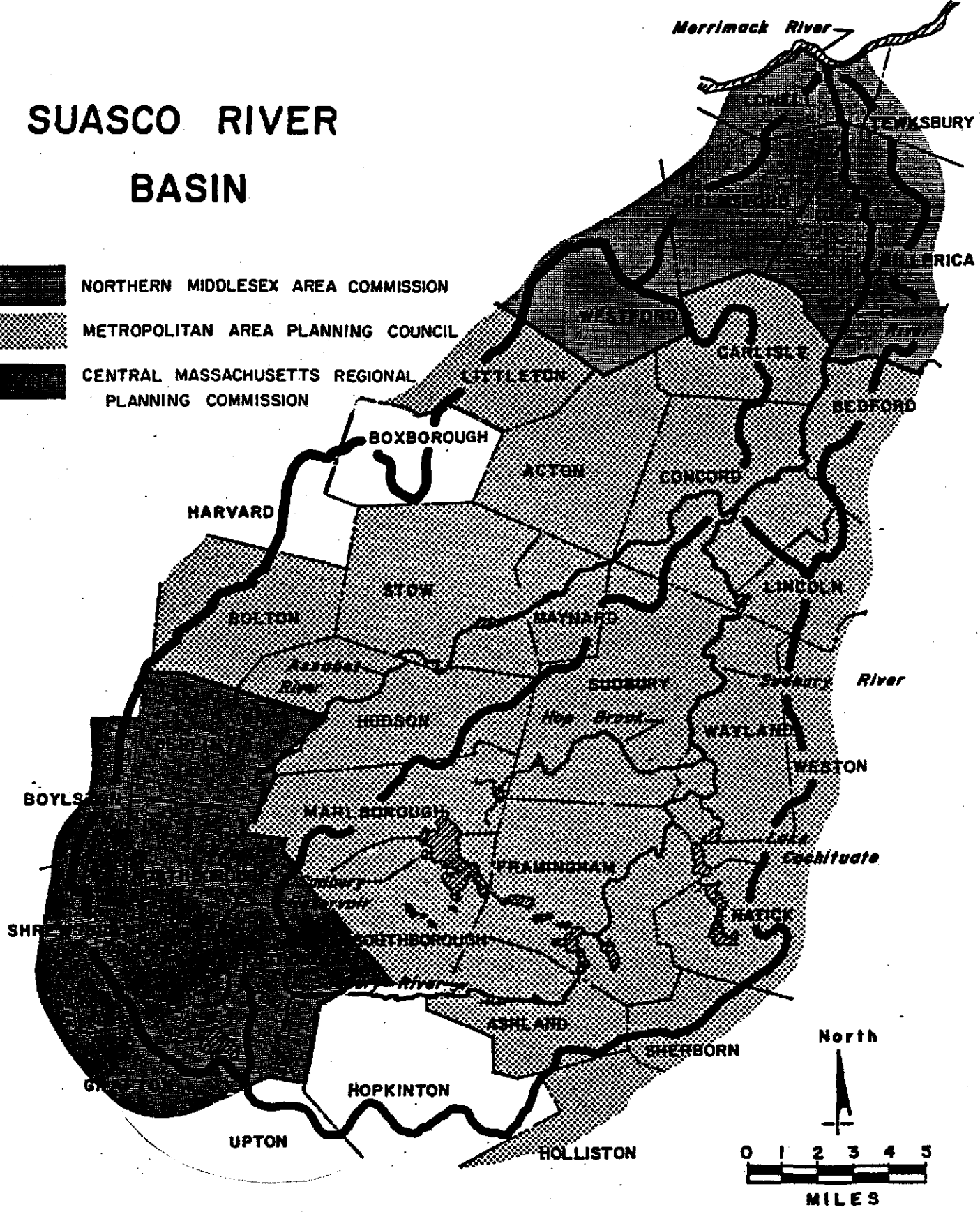
1. Billerica - The plan recommended the expansion of the existing secondary wastewater treatment facility and the addition of sludge-handling equipment. The expansion allowed the plant to accept wastewater from additional residential areas as well as from two major industries. The plan was submitted by the Division to the EPA in July 1972 and was approved in August 1972. The project was completed in the spring of 1975.
2. Maynard - The plan recommended the construction of a secondary treatment facility with a chlorination system. Digital Equipment Corporation, the major industrial waste contributor, was to build a pre-treatment facility. The construction of the treatment plant is scheduled for completion in October 1975.
3. Shrewsbury - This plan recommended the construction of a grit chamber at the treatment plant to alleviate many problems encountered because of the absence of such equipment. The plan was approved, and construction of the grit chamber was completed in 1974.

REGIONAL PLANNING AGENCIES

There are three regional planning agencies which have jurisdiction over the cities and towns located in the SUASCO basin planning area. The communities represented by each agency are shown in Figure IX-A. Each of the agencies has had a sewerage study prepared for its respective communities. In general, the studies assess the future sewerage needs of the communities, define the

SUASCO RIVER BASIN

-  NORTHERN MIDDLESEX AREA COMMISSION
-  METROPOLITAN AREA PLANNING COUNCIL
-  CENTRAL MASSACHUSETTS REGIONAL PLANNING COMMISSION



REGIONAL PLANNING AGENCIES

FIGURE IX-A

present and potential sewage disposal problem areas, and set forth a plan for meeting the sewerage needs. The studies also consider regional sewerage treatment alternatives and project the sewered populations of the future. Following is a discussion of the studies of the three regional planning agencies within the SUASCO River Basin planning area.

Central Massachusetts Regional Planning Commission (CMRPC) - A study conducted for this agency was completed in 1969 and covered the towns within the SUASCO River Basin of Berlin, Northborough, Shrewsbury, and Westborough. The document, Regional Sewerage Study and Plan, Phase I was submitted to the agency in June 1969. The study compiled an inventory of existing sewerage needs and outlined areas that would need sewerage systems in the future. A second phase of the study was planned but will be superseded by the 208 areawide waste treatment management planning (see page 81).

Northern Middlesex Area Commission (NMAC) - The Town of Billerica is the only community in the SUASCO basin planning area under the jurisdiction of this agency. The agency presented a two-phase study, of which the first part was Regional Utilities, prepared in November 1968. The second phase of the study was the Preferred Long-Range Sewer and Water Plan completed in January of 1972. In general, this plan is consistent with the basin planning of the Division. The plans call for the expansion of the sewerage system, the first phase of which has recently been completed. The NMAC plan also foresees sections of the towns of Chelmsford and Tewksbury being sewered to the Billerica Municipal Treatment Facility. This possibility is consistent with the alternatives set forth in this document and in the Merrimack River Basin Water Quality Management Plan.

Metropolitan Area Planning Council (MAPC) - As seen in Figure IX-A, the majority of communities within the SUASCO River Basin are under the jurisdiction of this agency. This agency had a series of extensive reports prepared which studied various sewerage plans for the member communities. The fourth report in the series of studies was Alternative Regional Sewerage Systems for the Boston Metropolitan Area, submitted to MAPC in March 1972. The studies showed problem areas in the communities, presented several regional alternatives, and gave preliminary cost estimates for the different alternatives. The study provided valuable information but is generally being superseded by the on-going Boston Harbor-Eastern Massachusetts Metropolitan Area Study (known as the EMMA Study). Aspects of the EMMA Study are similar to those suggested by the 1972 MAPC report.

BOSTON HARBOR-EASTERN MASSACHUSETTS METROPOLITAN AREA STUDY

The Metropolitan District Commission was authorized by the Massachusetts Legislature, under Chapter 803, Acts of 1972, to undertake this study. Also, the United States Army Corps of Engineers received a Congressional Resolution to conduct a wastewater study of the same area. In order to avoid duplication of effort, the two agencies made an agreement to jointly conduct the study. The study began in 1973 and is scheduled for completion in the summer of 1976. During the formulation of this study, the MDC has acted as chairman of a technical committee which has utilized its expertise in the evaluation of the most comprehensive and realistic plan for the metropolitan area. Representatives of the following agencies are part of the technical subcommittee: Metropolitan District Commission, U.S. Army Corps of Engineers, United States Environmental Protection Agency, Metropolitan Area Planning Council, Massachusetts Division of Water Pollution Control, Massachusetts Division of Environmental Health, Resource Management Policy Council, and a citizen advisory committee.

The final recommendations of the study will be presented to the public at an open hearing. The revised report will then be sent to the State Legislature, who must act upon the recommendations. If the Legislature approves the recommendations, it will delegate to the MDC the authority to implement the proposed wastewater management scheme.

There are 109 communities in the study area. All of the communities in the SUASCO River Basin management area are within the study area. A preliminary proposal suggests that 60 of these communities be part of the Metropolitan Sewerage District (MSD). The remaining communities have other wastewater management recommendations. The preliminary cost estimate for the implementation of the wastewater management plan is over one billion dollars. The study projects sewage needs to the year 2000 and, in some cases, 2020.

The preliminary plans show a moderate decentralization of sewage disposal by the construction of satellite regional sewage treatment plants on the Neponset and Charles Rivers. The latter is of some importance to some communities in the SUASCO River Basin.

The proposed facility would be an advanced wastewater treatment plant located on the Middle Charles River. The plant would serve the following communities: Framingham, Hopkinton, Ashland, Natick, Southborough, and most of Wellesley, with future service (after 2000) to Sherborn and part of Dover. The technical subcommittee feels that an extremely high-quality effluent would aid in low flow augmentation of the Charles River. By the year 2000, the projected flow of the plant is 30 MGD. The estimated cost, including capital, plant, interceptors, and pumping stations, is \$87,000,000 (1974 dollars). The annual operating cost would be \$4,900,000 (1974 dollars).

The preliminary plans recommend that the towns of Lincoln and Bedford be served by the MSD with their wastewaters treated at the Deer Island Treatment Plant. Also recommended is the construction of a secondary treatment system at the Deer Island facility.

This basin plan for the SUASCO River Basin is in basic agreement with the above-mentioned preliminary plans of the wastewater management study.

The satellite plant on the Charles River must be the most advanced plant that technology can provide. The study made preliminary recommendations for a regional facility in Marlborough (for Westborough, Shrewsbury, Northborough, and Marlborough), a regional plant in Concord, and a plant for Sudbury and Wayland discharging to the Sudbury River. The Marlborough facility is not in accordance with the program set forth in this basin plan. The Concord facility is a possibility but needs further study. The Concord area is recommended to be designated a 201 facilities planning area. The discharge of a Sudbury and Wayland facility to the Sudbury River is not in accordance with this basin plan, which is proposing that no discharges be added to the Sudbury River.

ENGINEERING CONSULTANTS

Most of the communities within the SUASCO River Basin have had one or more engineering reports prepared which present an in-depth study of the problem areas of the community. These reports make recommendations, when deemed necessary, for the construction of a treatment facility. Details for the construction of a facility and a cost analysis are included.

NATIONAL EUTROPHICATION SURVEY

The National Eutrophication Survey was initiated by the Environmental Protection Agency in 1972 to investigate the nationwide threat of accelerated eutrophication to freshwater lakes, reservoirs, and stream impoundments. The Survey was designed to develop information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point source discharge reduction and non-point source pollution abatement.

The Survey studied the Northborough, Hudson, and Maynard impoundments on the Assabet River; the Billerica impoundment on the Concord River; and Hager Pond at the headwaters of Hop Brook. The Survey confirmed the findings of the Division that the Assabet and Concord River impoundments are very eutrophic, have excessive nutrient levels and heavy growths of aquatic macrophytes. The important impact of this survey is the finding that, with point source control at the sewage treatment plants, there would be significant improvement in the trophic condition of the Hudson, Maynard, and Billerica impoundments. This basin plan for the SUASCO River Basin recommends advanced waste treatment facilities at all sewage treatment plants on the Assabet River. The control of these point sources of nutrients from the treatment plants would improve the trophic conditions of the Assabet and Concord Rivers.

The Hager Pond survey results and analyses are still in the developmental stages. The preliminary outlook is that the trophic condition of Hager Pond will improve because of the construction of the nutrient-removal facilities at the Marlborough East Sewage Treatment Plant. The final conclusions of the survey will be incorporated into the Division's ongoing evaluation of Hager Pond and Hop Brook.

RESEARCH PROJECTS

The Division granted a research project to the Civil Engineering Department of Northeastern University for the study of biokinetic rates for carbonaceous and nitrogenous oxygen demand in the Assabet River. The study was initiated to improve the inputs to the mathematical modeling of the Assabet River. In addition to the formulation of biokinetic rates, the study concluded that the Assabet River does not meet Class C water quality criteria and that sufficient phosphorus and nitrogen are available to support excessive algal and rooted aquatic plant growth. These findings are in accordance with those made by the Division in its studies of the Assabet River.

FUTURE PLANNING




The future planning for the SUASCO River Basin will be based upon this water quality management plan with revisions made when future study indicates the necessity for such changes. The implementation of this plan will be largely accomplished with Municipal Facilities Plans (Section 201) and Areawide Waste Treatment Management Plans (Section 208).

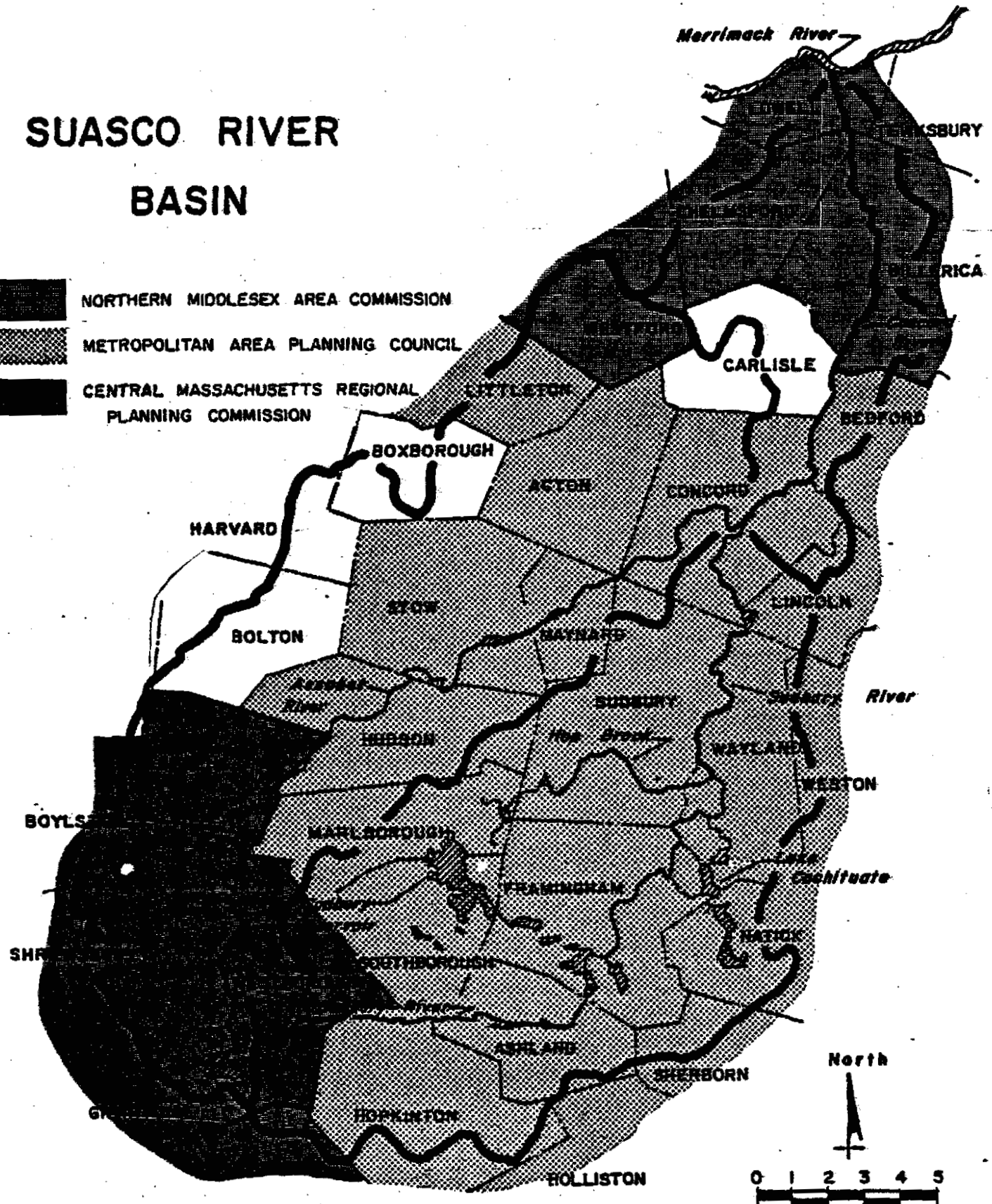
Municipal facilities plans - These plans cover the planning and preliminary design portions of plans and studies related to the construction of publicly owned wastewater treatment plants. Facilities plans, through the systematic evaluation of alternatives, are intended to assure the development of cost effective and environmentally sound local wastewater treatment systems. The municipal facilities planning requirements must be met in order for a project to receive a federal construction grant. The wastewater treatment plants resulting from the municipal facilities plans must be capable of producing effluents which are consistent with the effluent limitations set forth in the 303(e) water quality management plan.

The development of proper facilities plans is of utmost importance in the pollution abatement program for the SUASCO River Basin. The towns of Westborough and Shrewsbury are developing a facilities plan to address the needs of both communities and explores the possibility of a regional facility. The Town of Hudson is developing a facilities plan to upgrade its facility to an acceptable effluent limitation. A facilities plan will be developed for the Greater Concord area, including (but not limited to) the towns of Acton, Concord, Littleton, and Maynard. The Town of Billerica should develop a plan in accordance with its desired sewer expansion program and the possibility of sewerage sections of Chelmsford and Tewksbury. The City of Marlborough and the Town of Northborough will need a plan for the upgrading and expansion of their regional facility.

Areawide Waste Treatment Management Plans - These provide for the development of plans for areas having substantial water quality control problems resulting from urban-industrial concentrations and other factors. Such areas are provided funding to develop and manage a comprehensive program controlling local municipal and industrial wastewater, storm and sewer runoff, non-point source pollutants, and land use as it relates to water quality. Criteria have been set forth both for the areas to be studied and for the agencies to perform the studies. In the Commonwealth, the regional planning agencies have been the organizations designated by the Governor to develop the plans. Figure IX-B shows the areas designated for the development of

SUASCO RIVER BASIN

-  NORTHERN MIDDLESEX AREA COMMISSION
-  METROPOLITAN AREA PLANNING COUNCIL
-  CENTRAL MASSACHUSETTS REGIONAL PLANNING COMMISSION



208 AREAWIDE

WASTE TREATMENT MANAGEMENT DESIGNATION

FIGURE IX-B

Section 208 areawide waste treatment management plans in the SUASCO River Basin. The planning efforts will be coordinated with the Division's continuing water quality management planning.

The Metropolitan Area Planning Council's scope of work under the 208 program includes an investigation of urban runoff problems in the towns of Ashland, and Framingham; a study of the soils and groundwater of the communities in their planning area; and the formulation of a facilities plan for Acton, Concord, Littleton, and Maynard.

The Central Massachusetts Regional Planning Commission's project control plan for 208 planning includes water-related land use; evaluation of non-point sources; investigation of urban and stormwater runoff; and sampling of the Assabet River.

The Northern Middlesex Area Commission's 208 work will include an in-depth study of the generation of waste; an evaluation of the dominant source of non-point pollution, rather than a limited evaluation of all non-point sources; and a review of land use and zoning in the Town of Billerica.

X. MONITORING PROGRAM

In order to assess the progress made towards achieving the goals of this water quality management plan, the Division has developed a comprehensive monitoring program in accordance with the 1972 Amendments to the Federal Water Pollution Control Act (PL92-500). The program for the waters of the Commonwealth contains the following eight elements:

1. Intensive water quality surveys
2. Biological monitoring
3. Lake monitoring
4. Compliance monitoring
5. National Water Quality Surveillance Sampling Network
6. Water quality monitoring network
7. Groundwater monitoring
8. Special studies

The main aspects of these elements and the specific program for the SUASCO River Basin are discussed below.

Intensive water quality surveys - Beginning in 1963, under the direction of the Massachusetts Department of Public Health, intensive water quality surveys have been conducted on all the major river basins of the Commonwealth. With the formal establishment of the Division in 1967, the program has been progressively expanded in scope. Depending upon the pollution abatement program of each basin, the surveys have been conducted at intervals ranging from three to ten years.

It is the goal of the Division to survey each river basin and major estuary and harbor at least every five years. At least one location in each segment of the basin will be sampled for two 24-hour periods during each of two weeks. All samples will be analyzed for dissolved oxygen, temperature, pH, biochemical oxygen demand, total alkalinity, suspended solids, ammonia-nitrogen, nitrite-nitrogen, nitrate-nitrogen, total phosphorus, chlorophyll a, total coliform bacteria, and microanalysis. Additional tests for particular constituents (e.g., oil and grease, heavy metals, pesticides, etc.) will be performed where appropriate.

Water quality surveys were conducted on the Concord and Sudbury Rivers in 1965 and 1973; while surveys of the Assabet River were conducted in 1965, 1969, and 1974. The 1973 and 1974 surveys were the most comprehensive and broadest in scope. The location of sampling stations during those surveys and the corresponding segment numbers of those locations are given in Tables X-1 and X-2 and shown in Figure X-A. In 1979, a survey is scheduled to be conducted by the Division on the Concord, Sudbury, and Assabet Rivers and their major tributaries. The locations listed in Tables X-1 and X-2 will be sampled with additional locations which will enhance the knowledge of the progress of the pollution abatement program.

Biological monitoring - This program was developed by the Division in 1973 with the goal of conducting biological studies on all major basins on a five-year basis. Bottom dredge samples are collected at selected stations and benthic macroinvertebrates are identified and classified

TABLE X-1

LOCATION OF SAMPLING STATIONS - 1974 SURVEY

ASSABET RIVER BASIN

<u>SEGMENT NUMBER</u>	<u>STATION NUMBER</u>	<u>LOCATION</u>	<u>RIVER MILE</u>
AS01	AS01	At the water intake, George H. Nichols Dam, Westborough	31.8
AS01	AS02	Bridge on Maynard Street, Westborough	31.0
AS01	AS03T*	Outlet of Hocomonco Pond, Otis Street, Westborough	30.5 + 0.5
AS02	AS04	Bridge on Route 9, Westborough	30.1
AS03	AS05	Bridge on Route 135, Westborough-Northborough line	29.2
AS03	AS06	School Street Bridge, Northborough	28.3
AS03	AS07	Above Route 20 dam, Northborough	26.5
AS04	AS07T	Outlet of Cold Harbor Brook, Hudson Street, Northborough	26.2 + 0.1
AS04	AS08	Above dam, Allen Road, Northborough	25.4
AS04	AS09	Boundary Street Bridge, Northborough-Marlborough line	24.2
AS05	AS10	Bridge on Robin Hill Road, Marlborough	23.8
AS05	AS10T	North Brook at Bridge Road, Berlin	22.7 + 0.3
AS05	AS11	Bigelow Street Bridge, Berlin	22.0
AS05	AS12	Chapin Road Bridge, Hudson	19.6
AS05	AS13	Above dam, Route 85, Hudson	18.2
AS05	AS14	Cox Street Bridge, Hudson	16.2
AS06	AS15	Above dam, Route 62, Gleasondale	14.4
AS07	AS16T	Outlet of Boons Pond, Stow	12.4 + 0.2
AS07	AS17	Above dam, Routes 62 and 117, Maynard	9.0
AS07	AS18	At USGS gage, Routes 62 and 117, Maynard	7.7

TABLE X-1 (Continued)

<u>SEGMENT NUMBER</u>	<u>STATION NUMBER</u>	<u>LOCATION</u>	<u>RIVER MILE</u>
AS08	AS19	Above dam, High Street, Acton	6.5
AS08	AS20	Bridge on Route 62 at Damondale, West Concord	4.6
AS08	AS21T	Outlet of Warner's Pond, Commonwealth Avenue, West Concord	2.8 + 0.2
AS09	AS22	Off the shore at the base of Nashawtuc Hill, Concord	0.4

* - "T" denotes a tributary to the main stem of the Assabet River.

TABLE X-2

LOCATION OF SAMPLING STATIONS - 1973 SURVEY

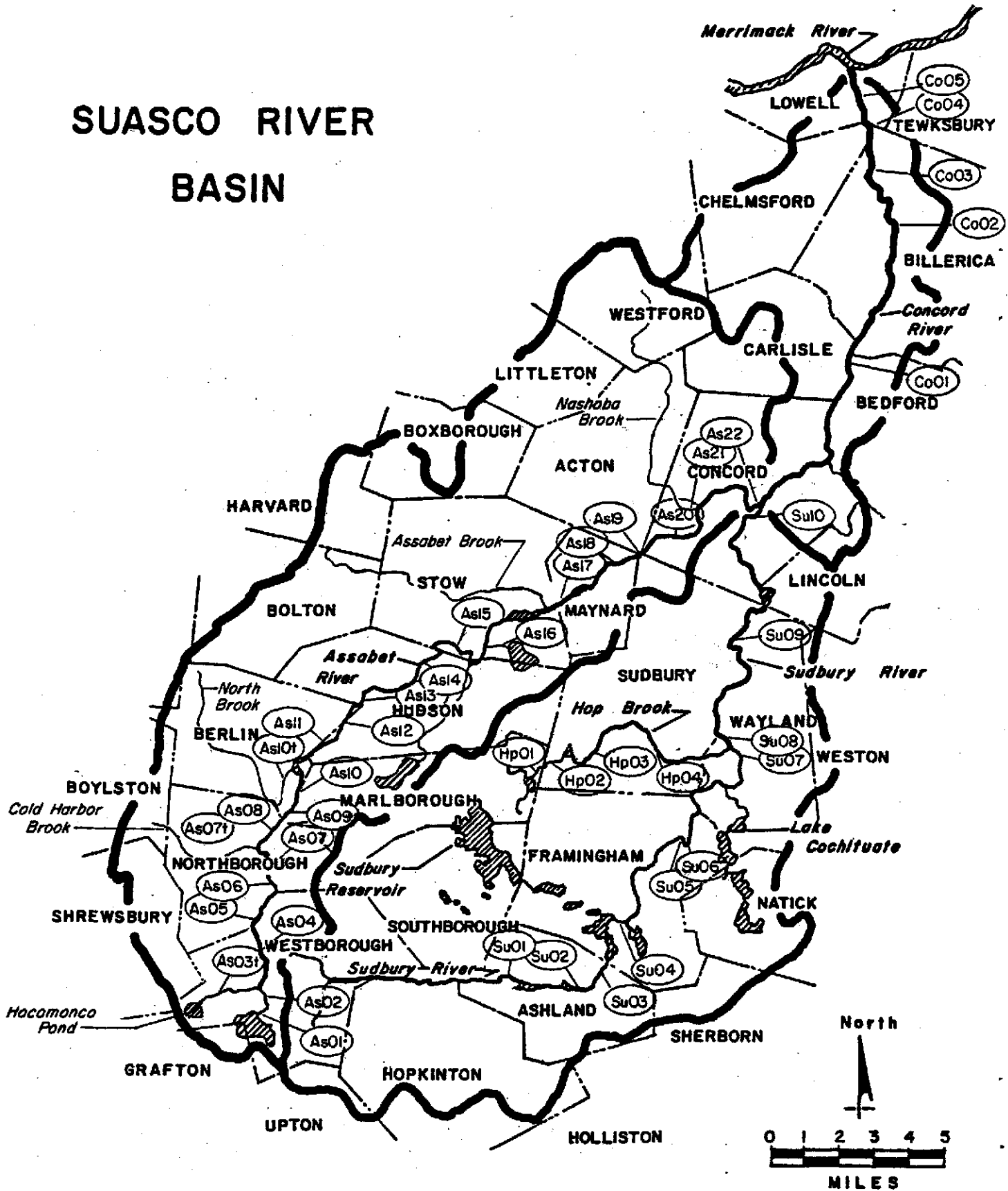
CONCORD AND SUDBURY RIVERS

<u>SEGMENT NUMBER</u>	<u>STATION NUMBER</u>	<u>LOCATION</u>	<u>RIVER MILE</u>
		<u>Sudbury River</u>	
SU01	SU01	Bridge on Cordaville Road, Ashland	40.7
SU01	SU02	Cold Spring Brook, Chestnut Street, Ashland	39.2 + 0.1
SU01	SU03	Bridge on Route 135 below confluence of Cold Spring Brook, Ashland	38.9
SU01	SU04	Above dam, outlet of Sudbury Reservoir No. 1, Winter Street, Framingham	36.1
SU01	SU05	Above Colonna Dam, Central Street, Framingham	31.6
SU02	SU06	Bridge on Elm Street, Framingham	31.1
SU02	SU07	Bridge on Pelham Island Road, Wayland	26.6
SU03	SU08	Bridge on Route 20, Wayland	26.1
SU03	SU09	Bridge on Route 117, Lincoln-Concord line	20.0
SU03	SU10	Bridge on Nashawtuc Road, Concord	15.7
		<u>Concord River</u>	
CO01	CO01	Bridge on Route 225, Bedford-Carlisle line	10.5
CO01	CO02	Bridge on Pollard Avenue, Billerica	5.2
CO02	CO03	Bridge on Route 495 North, Lowell	2.5
CO02	CO04	Bridge on Rogers Street, Lowell	1.0
CO02	CO05	Bridge on East Merrimack Street, Routes 38 and 110, Lowell	0.2
		<u>Hop Brook (Wash)</u>	
HP01	HP01	Inlet of Hager Pond, Route 20, Marlborough	26.2 + 9.5
HP01	HP02	Above dam, outlet of Hager Pond off Hager Pond Road, Marlborough	26.2 + 9.2
HP01	HP03	Upstream of culvert, French Road, Sudbury	26.2 + 7.4
HP01	HP04	Bridge on Elm Street, Sudbury	26.2 + 1.7

TABLE X-2 (Continued)

<u>SEGMENT NUMBER</u>	<u>STATION NUMBER</u>	<u>LOCATION</u>	<u>RIVER MILE</u>
		<u>Assabet River</u>	
AS09	AS22	Off the shore at base of Nashawtuc Hill, Concord	15.2 + 0.4

SUASCO RIVER BASIN



LOCATION of SAMPLING STATIONS

FIGURE X-A

according to varying levels of pollution tolerance. Organisms are classified as intolerant, facultative, or tolerant. The study time for a major river basin is about four months. The data and interpretation are published as part of the water quality analysis report prepared by the Division.

Biological monitoring has not yet been conducted on the rivers of the SUASCO River Basin. During the Assabet River survey of 1974, biological sampling was conducted on six lakes in the basin. The results of this work, which consisted of identification and enumeration of benthic organisms, will be given in the report, Baseline Surveys on Selected Lakes and Ponds in the Assabet River Basin, to be published by the Division. Biological sampling of the main stem of the Concord, Sudbury, and Assabet Rivers is scheduled to be conducted to coincide with the water quality survey of 1979. The results of the biological sampling will be included in the SUASCO River Basin Water Quality Analysis 1979.

Lake monitoring - This program, started in 1971, went into full gear in 1974 with the development of an intensive, year-round program. Five lakes, selected for intensity of use and/or water quality problems, are sampled monthly for a one-year period. The studies include lake geometry, location of tributaries, and special studies. Also, baseline lake surveys are conducted in conjunction with the water quality surveys. The data from these surveys will be published by the Division.

Baseline surveys were conducted on six ponds and lakes in the Assabet River Basin during the 1974 water quality survey. The waterbodies studied were: Hocomonco Pond, Rocky Pond, Boons Pond, Warners Pond, Chauncy Lake, and Flow Augmentation Pond. Their locations are shown in Figure X-B. During the 1979 survey of the SUASCO River Basin, baseline surveys will be conducted on several lakes and ponds in the basin. The study areas will be designated at a later date.

Nutting Lake, located in the Town of Billerica, was one of the selected locations for the 1974-75 intensive lake program. The study was completed in April 1975, and the results of this investigation will be found in the report, Nutting Lake Study 1974-75, to be published by the Division. Wau-shakum Pond, located in the towns of Framingham and Ashland, is one of the selected study areas for the 1975-76 intensive study program. The study will be conducted by the lake section of the Division on a monthly basis until April 1976.

Compliance monitoring - Monitoring of waste discharges is required to assure compliance with the terms of the discharge permits. The monitoring will be coordinated with the sampling of treatment facilities for operation and maintenance purposes and the discharge analysis required for mathematical modeling. All major and ten to twenty percent of the minor municipal and industrial discharges are sampled each year. The type of discharge samples collected will range from twenty-four hour composites on major municipal facilities to grab samples on some minor industrial discharges. The parameters for analysis of each sample will depend on the nature of the discharge and the terms of the discharge permit.

Compliance monitoring of discharges within the SUASCO River Basin is conducted by the Division in accordance with EPA guidelines. The major

ASSABET RIVER BASIN



BASELINE LAKE and POND SURVEYS - 1974

FIGURE X-B

facilities located in the SUASCO River Basin are listed in Table X-3 and their locations shown in Figure X-C. These facilities will be sampled yearly. Several minor discharges are located in the basin, most of which discharge to a municipal treatment facility.

National Water Quality Surveillance Sampling Network - This program was established in Massachusetts in the summer of 1974 in order to assess the impact of pollution abatement projects on selected streams. A total of nine stations, located on the Connecticut, Nashua, and Merrimack Rivers and Boston Harbor, are sampled monthly and analyzed for dissolved oxygen, temperature, chemical oxygen demand, pH, chlorophyll a, suspended solids, total solids, oil and grease, nitrogen series (total Kjeldahl, ammonia, nitrite, nitrate), total phosphorus, total and fecal coliform bacteria, radiochemical, specific conductance, and turbidity. Quarterly samples are collected and analyzed for sediment samples, total cations, total anions, total metals, phenols, and PCB.

There are no NWQSS stations on any stream in the SUASCO River Basin. The Division feels that such a station located on the Assabet River would show the degree of improvement in water quality resulting from the construction of advanced waste treatment plants.

Water quality monitoring network - This network consists of telemetric monitors which provide continuous records of dissolved oxygen, temperature, pH, and specific conductance. Nine telemeter stations are operated jointly by the Division and the United States Geological Survey. Data from these monitors are published annually by USGS in Water Resources Data for Massachusetts, New Hampshire, Rhode Island, and Vermont.

There is no telemeter monitor located in the SUASCO River Basin. However, a telemeter monitor, located in the meadowland section of the Concord and Sudbury Rivers, would be very beneficial in the study and monitoring of the extreme dissolved oxygen problems that occur in that section of the river. The monitor would detect the period of critical dissolved oxygen levels.

Groundwater monitoring - This program will be established in conjunction with other appropriate agencies in accordance with EPA rules and regulations. The testing of groundwater sources is currently conducted by the Division of Environmental Health and the respective agency of the individual communities.

An engineering consulting firm is currently engaged in a groundwater study of the SUASCO River Basin. The study is concerned with available groundwater sources, future water demands, and methods to assure the fulfillment of these demands. Also, the United States Geological Survey is initiating a study program which will deal with groundwater, hydraulics, and hydrology of the SUASCO River Basin.

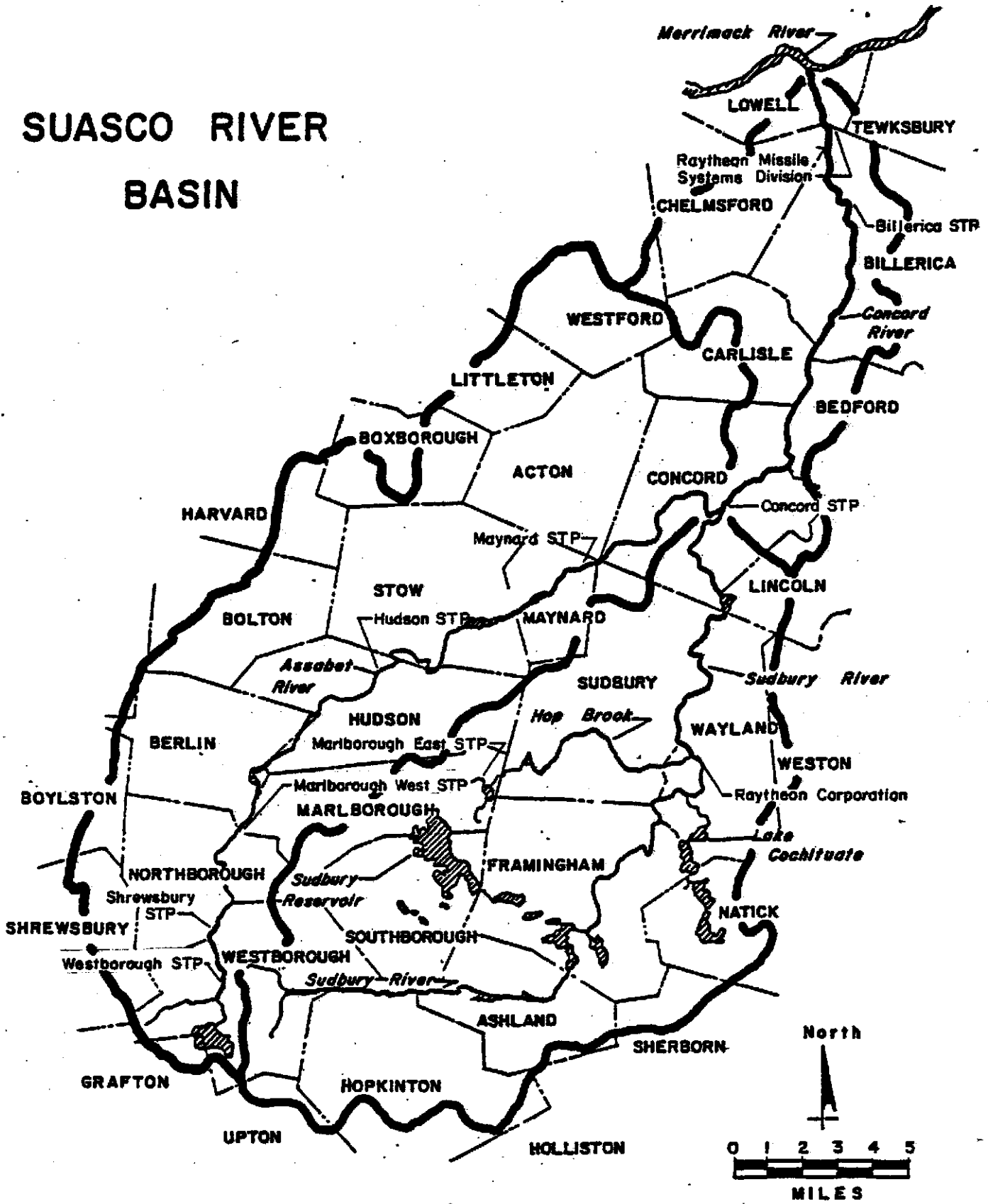
Special studies - Selected studies will be conducted to evaluate specific problems of the waters of the Commonwealth. Studies will be undertaken to evaluate the impact of non-point sources, combined sewer overflows, and urban runoff. Field studies for mathematical modeling needs, such as flow and time-of-travel studies, will continue to be performed.

A program is currently underway to evaluate the impact of phosphorus removal at sewage treatment facilities on the water quality of the receiving water.

TABLE X-3
 MAJOR DISCHARGES
 SUASCO RIVER BASIN

<u>DISCHARGE</u>	<u>LOCATION</u>	<u>RECEIVING WATER</u>
Billerica Sewage Treatment Plant	Billerica	Concord River
Concord Sewage Treatment Plant	Concord	Great Meadow Swamp
Hudson Sewage Treatment Plant	Hudson	Assabet River
Marlborough East Sewage Treatment Plant	Marlborough	Hop Brook
Marlborough West Sewage Treatment Plant	Marlborough	Assabet River
Maynard Sewage Treatment Plant	Maynard	Assabet River
Shrewsbury Sewage Treatment Plant	Northborough	Assabet River
Westborough Sewage Treatment Plant	Westborough	Assabet River
Raytheon Corporation, Missile Systems Division	Billerica	Concord River

SUASCO RIVER BASIN



LOCATION OF MAJOR DISCHARGES

FIGURE X-C

A phosphorus-monitoring program is being conducted on Hop Brook to assess the impact of the Marlborough East Sewage Treatment Plant. This plant is the first major facility in the Commonwealth to practice year-round phosphorus removal. Samples are collected monthly at selected stations on Hop Brook and analyzed for numerous chemical and biological parameters. The program will be expanded to monitor other facilities which construct phosphorus removal facilities. Listed below are facilities and the receiving water that will be incorporated into the phosphorus monitoring by the end of 1976:

<u>Facility</u>	<u>Receiving Water</u>
Fitchburg West STP	Nashua River
Fitchburg East STP	Nashua River
Pittsfield STP	Housatonic River
Upper Blackstone WPAD	Blackstone River

Programs to monitor other facilities and other parameters will be initiated as the need for these studies develops.

XI. PUBLIC PARTICIPATION

Classification of the SUASCO River Basin was accomplished at a public hearing on April 24, 1967, at Lowell State College, Lowell. Comments from federal, state, and local government officials and the general public were invited. Similar public hearings were conducted in all Massachusetts drainage basins. Information presented at these hearings included present and proposed classifications, data on existing water quality, and pollution abatement implementation schedules.

Public participation for individual abatement projects has primarily consisted of meetings with local boards and public hearings on proposed sites for treatment facilities. All expenditures for municipal treatment facilities are subject to Town Meeting (or City Council) action. In some areas, the Division has worked with regional planning agencies and watershed groups towards regional pollution abatement solutions.

The Federal law, PL92-500, requires increased public participation. Plans prepared under Sections 201, 208, and 303(e) of PL92-500 must be adopted through public hearings. Public participation during the formulation of such plans is encouraged. The public participation programs for all planning efforts should be coordinated to avoid duplication while providing ample and meaningful opportunities for public input.

The Division conducted a public meeting for the SUASCO River Basin. At the meeting, the existing water quality conditions, existing goals, and abatement programs were presented. The Division also presented an introduction to the basin planning activities of the Division and, in particular, the SUASCO River Basin Plan.

A formal hearing was conducted for the adoption of this basin plan. The hearing also covered the reclassification of the waters of the SUASCO River Basin. Formal statements from the public on the basin plan were solicited at the hearing.

Appendix 3 of this document contains a discussion of the public meeting and hearing.

XII. PLAN SUMMARY

BASIN PLAN FUNCTIONS

Basin water quality management plans are required by the Federal Water Pollution Control Act Amendments of 1972 (PL92-500). The purpose of a basin plan is to establish a framework of pollution abatement actions which will result in the attainment of water quality goals. Such actions include construction of sewers and treatment facilities and additional planning efforts to meet long-term goals. The latter include two types of plans specified by the Federal Act: Section 201 Municipal Facilities Plans, and Section 208 Areawide Waste Treatment Management Plans. The SUASCO River Basin Water Quality Management Plan has been prepared under the authority and methodology described in the Massachusetts Continuing Planning Process. This basin plan represents the abatement strategy of the Massachusetts Division of Water Pollution Control for the SUASCO River Basin. Implementation of the recommendations of this basin plan will be accomplished through the discharge permit program (National Pollutant Discharge Elimination System).

EXISTING WATER QUALITY PROBLEMS

The Assabet River has severe water quality problems caused by the discharge of six sewage treatment plants into this low-flow and slow-moving river. The treatment plants are spaced along the river from near its headwaters to its mouth such that the river never has a chance to naturally recover from the continuous polluttional load. The plants do not provide an adequate degree of treatment and create extremely eutrophic conditions in the numerous impoundments located on the river. Non-point pollution sources exist in the river but are greatly overshadowed by numerous point sources. The Assabet River does not meet its assigned classifications in any section of its entire course.

The Sudbury River has moderate non-point pollution problems in the upper portions and in the Reservoir and Saxonville Pond sections. The problems are high coliform bacteria levels caused from septic leachate and urban runoff. The section of the river from Saxonville to the Assabet River, which flows through vast meadowlands, has critically low levels of dissolved oxygen during certain periods of the summer. Also, this section of the Sudbury River has moderately high coliform bacteria levels. Unlike the Assabet River, where water quality problems can be traced to man-made discharges, the Sudbury River water quality problems are basically a result of natural phenomena. Hop Brook, a major tributary to this section of the Sudbury River, has water quality problems resulting from the discharge of a sewage treatment plant at its headwaters. The Sudbury River does not meet its assigned classification in any section of its course.

The Concord River, for much of its course, has the same water quality problems as the meadowland section of the Sudbury River. The river receives several discharges from municipal and industrial sources. These discharges are located mainly in the last five miles where the river becomes an urban river. Raw sewage discharges create high coliform bacteria levels, high solids levels, and unsightly looking water. The Concord River, akin to its two partners in the SUASCO River system, does not meet the standards for its assigned classification in any section of the river.

WATER QUALITY STANDARDS AND GOALS

The legal authority of this basin plan and its implementation through the permit program is based on the Massachusetts Water Quality Standards as revised in May 1974. Stream classifications for the SUASCO River Basin under these standards are shown in Figure XII-A. Following the completion of the abatement program outlined in this basin plan, most of the waters of the SUASCO River Basin should attain their designated water use classifications. Some water quality problems will remain, such as urban runoff, non-point sources, combined sewers, and eutrophication of stream impoundments. These problems will be addressed by the Division as part of the continuing planning process.

ABATEMENT PROGRAMS

The pollution abatement program for the communities in the SUASCO River Basin planning area varies according to the municipal sewerage needs. Table XII-1 shows the recommended action for the individual communities, including a tentative timetable for the various steps in the pollution abatement program. Communities not shown in Table XII-1 do not need abatement action during the design life of this plan. The abatement for the City of Lowell, needed to solve the water quality problems of the lower Concord River, are addressed in the Merrimack River Water Quality Management Plan.

An abatement program is more critical for some communities than for others. An abatement priority list for those communities known to need construction of treatment facilities is given in Table XII-2. It can be seen that construction of advanced wastewater treatment facilities for the Assabet River is the top priority.

The proper solution of municipal needs may be a regional solution which involves two or more communities. This may be a 201 facilities planning area, a regional sewage treatment facility, a septage treatment plant, or an expanded sewerage system. This basin plan recommends regional actions for certain communities of the SUASCO River Basin. Table XII-3 lists and Figure XII-B shows these communities.

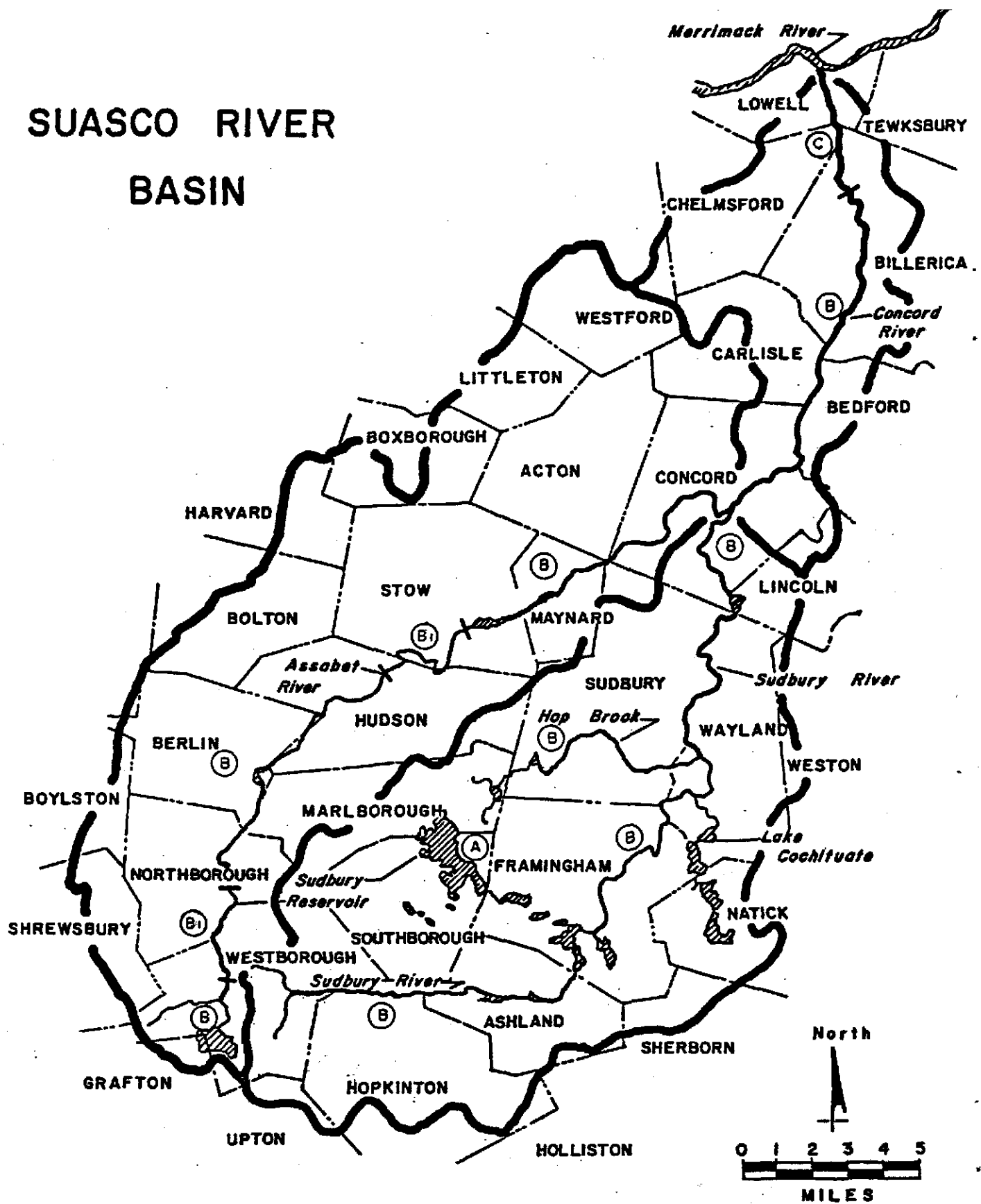
MONITORING PROGRAM

Implementation of the basin plan recommendations will be monitored by the Division through review of construction and operating reports on treatment facilities, periodic inspection of such facilities, and a program of water quality sampling.

The Division's monitoring program contains the following elements: lake surveys; compliance monitoring; groundwater monitoring; water quality monitoring network; and the National Water Quality Surveillance Sampling Network. The monitoring program for the SUASCO River Basin includes:

1. An intensive water quality survey, scheduled for 1979, conducted on the major rivers and streams in the basin. The survey will also include biological sampling and baseline lake surveys.
2. Annual sampling of all major wastewater treatment facilities.

SUASCO RIVER BASIN



WATER USE CLASSIFICATIONS

FIGURE XII-A

TABLE XII-1

SUMMARY OF ABATEMENT PROJECTS

SUASCO RIVER BASIN

<u>COMMUNITY</u>	<u>PROJECT</u>	<u>TENTATIVE COMPLETION DATE</u>
Acton	Facilities Plan	January 1, 1978
Ashland	Expansion of MSD system	July 1, 1993
Billerica	Expansion of sewerage system Upgrade sewage treatment plant	January 1, 1990
Concord	Facilities Plan Expansion of sewerage system Upgrade sewage treatment plant	January 1, 1978 January 1, 1981 January 1, 1981
Framingham	Expansion of MSD system	January 1, 1982
Hopkinton	Expansion of MSD system	July 1, 1993
Hudson	Facilities Plan Upgrade sewage treatment plant	January 1, 1977 January 1, 1980
Littleton	Facilities Plan	January 1, 1978
Marlborough	Upgrade sewage treatment plant	January 1, 1980
Maynard	Facilities Plan Upgrade sewage treatment plant	January 1, 1978 January 1, 1981
Natick	Expansion of MSD system	January 1, 1982
Northborough	Expansion of sewerage system	January 1, 1978
Shrewsbury	Facilities Plan Upgrade sewage treatment plant	November 1, 1976 November 1, 1979
Sudbury	Septage treatment facility	June 1, 1977
Wayland	Septage treatment facility	June 1, 1977
Westborough	Facilities Plan Upgrade sewage treatment plant	November 1, 1976 November 1, 1979

TABLE XII-2

WATER QUALITY PROJECT CONSTRUCTION PRIORITY LIST

SUASCO RIVER BASIN

<u>RANKING</u>	<u>ABATEMENT PROJECT</u>
1	Westborough-Shrewsbury STP
2	Hudson STP
3	Marlborough West STP
4	Maynard STP
5	Marlborough East STP
6	Concord STP
7	Billerica STP
A*	Sudbury-Wayland Septage Facility
B*	Expansion of MSD system

*The septage facility will be built by 1977, and the expansion of the MSD system is a long-range project.

TABLE XII-3

REGIONAL CONSIDERATIONS

SUASCO RIVER BASIN

COMMUNITIES

Shrewsbury
Westborough

Ashland
Framingham
Hopkinton
Natick
Southborough

Sudbury
Wayland

Acton
Concord
Littleton
Maynard

Billerica
Chelmsford
Tewksbury

Marlborough
Northborough

REGIONAL PROJECTS

Facilities Plan
Advanced Waste Treatment Plant

Expansion and enlargement of MSD system

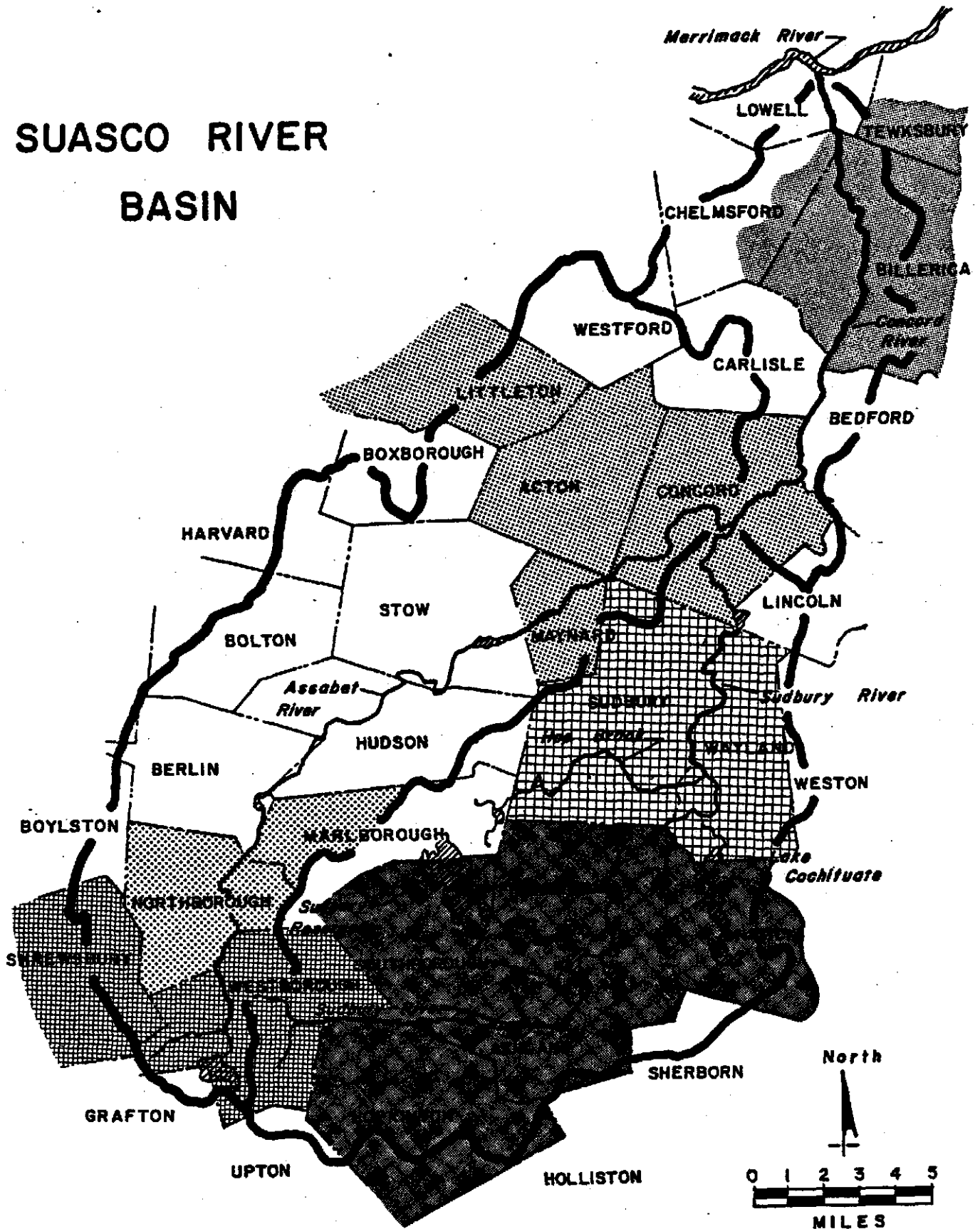
Construction of a septage
treatment facility

Facilities Plan

Regional sewage treatment system

Regional sewage treatment system

SUASCO RIVER BASIN



REGIONAL CONSIDERATIONS

FIGURE XII-B

3. An intensive lake survey on Waushakum Lake conducted 1975-76, and an intensive lake survey on Lake Cochituate conducted 1976-77.

4. The possible selection of a monthly sampling location on the Assabet River as part of the NWQSS.

5. The continuation and expansion of the monitoring program to evaluate the effects of the nutrient-removal facilities at the Marlborough East Sewage Treatment Plant.

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