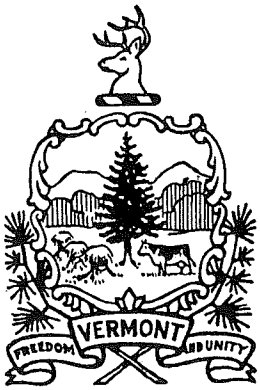
T. Willard



1980 VERMONT WATER QUALITY ASSESSMENT
(305(B) REPORT)

AGENCY OF ENVIRONMENTAL CONSERVATION
DEPARTMENT OF WATER RESOURCES
MONTPELIER, VERMONT 05602

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INTRODUCTION

This report is an assessment of Vermont's water quality programs and progress made and problems encountered in those programs. It covers point and nonpoint sources, water quality planning and management activities, regulatory programs and special studies.

It is clear that while some progress has been made, most notably an increase in stream and lake water quality due to upgrading and construction of wastewater treatment facilities and in the beginning of voluntary best management practices in forestry, agriculture, and backroad maintenance, it is equally clear that very substantial existing and potential problems threaten the progress which has been made. Little if any progress has been made in combined sewer overflow and urban runoff problems. Although many more wastewater treatment facilities are on line, the operation and maintenance of these facilities is critical and more attention must now be focused on proper treatment plant operation. In the management of waste discharges it is critical that the discharge wasteloads be closely monitored and compared to treatment plant adequacy and design capacity, so that as communities and industries grow, proper facility planning, design and construction occur before NPDES permit limits are exceeded and discharges become violations. Without proper planning and management in this area, we could in the year 1990 or 2000 again be in a pollution abatement situation. The potential for this is great since communities will have to bear the full cost of their growth after the present pollution abatement program is over. A key to avoidance of this problem is a proposed revision to and implementation of the Agency Policy on Connections to Municipal Facilities.

Another very real threat to Vermont's waters, particularly the very high quality waters in upland areas, is mounting from increasing growth and new construction of recreational facilities, condominiums, residences, and commercial facilities where municipal facilities do not exist. Most of the areas where this increased growth is occurring is in unique, fragile areas with a very limited capability for on-site waste disposal. Failure of these systems is increasing, resulting in pollution of the high quality upland waters. This situation will require close management attention if serious problems are to be avoided.

Vermont's Water Quality Standards are exemplary in that through the public process they set high objectives for water uses and high technical criteria for each class of water. However, these standards will come under increasing pressure as development and economic pressures increase. Evaluation of the impact of discharges on water quality will become more and more important in assuring that standards are met, especially

the anti-degradation standards for high quality water. Some management mechanism will have to be developed to cope with the cumulative effect of many discharges over a period of time. Just as wasteload allocation is now necessary to meet water quality standards in several stream segments, so will phosphorus load allocations be necessary in other areas.

In the face of increasingly limited financial resources every opportunity will need to be taken to face the existing and potential problems which threaten Vermont's high quality waters.

I. POINT SOURCES

(A) Municipal

The major pollution problem in Vermont remains the discharge of domestic sanitary waste by municipalities. Since 1959, the State has constructed 22 primary and 65 secondary sewage treatment plants. All facilities constructed since 1965 have been secondary or offstream disposal. There remain 20 municipalities which are discharging without treatment and which require a central collection and treatment/disposal system and 22 municipalities which now operate primary or other treatment plants requiring upgrade to secondary. These projects are shown, together with their respective costs, on the attached project priority list for fiscal year 1980. (See Appendix A).

Facilities planning is underway in all but two of the municipalities identified above and Step II planning is underway in 12 municipalities. Sixteen municipalities have projects under construction at this time.

Vermont has traditionally encouraged pollution abatement activities based upon least cost and maximum environmental benefit. This has lead to promotion of land treatment and disposal for small communities which were technically unable to employ individual septic tank and leachfield systems. The U.S. Environmental Protection Agency, in recent years, has begun active promotion of land treatment and disposal as an alternative to mechanical/capital/operating cost intensive discharging facilities. The recent growing national concern for ground water protection appears to have created an impasse for the approval of land treatment and disposal projects which inevitably cause the contamination of underlying ground waters. Vermont has 7 communities which have or shortly will have completed a facilities plan which concludes that the most environmentally sound, cost effective project is one which employs land treatment and disposal. Those projects account for expenditure of 2.2 million of FY80 funds, 75% of that set aside for Innovative/Alternative funding and 100% of that set aside for small communities. Immediate efforts are being made to eliminate this programmatic roadblock and to continue the practice of land treatment and disposal where no real identifiable environmental or private property damage will result. This issue is of primary program concern.

Progress in the area of municipal pollution abatement continues to have general public and legislative support in Vermont. Currently, program accomplishment is limited only by annual appropriations for construction grant funding and administrative/planning delays attendant to frequent regulatory and policy changes. Proposed legislation pending in Congress, providing a two tier funding appropriation, would assist in alleviating the funding limitation in accomplishment, and 205(g)

delegation authority accepted by Vermont in 1979 should help speed administrative processing of projects. Table I shows the status of the Vermont municipal pollution abatement program. Table II lists the major municipal and non-municipal discharges in Vermont.

TABLE I

SUMMARY OF MUNICIPAL WASTEWATER TREATMENT FACILITIES AS OF JANUARY 1980

a)	Number of municipalities requiring central sewage collection and treatment	102
b)	Number of municipalities served by primary treatment	13
c)	Number of municipalities served by secondary treatment	65
d)	Number of municipalities served by offstream disposal	4
e)	Number of municipalities served by no treatment	20
f)	Number of major treatment facilities	21
g)	Number of minor treatment facilities	61
h)	Number of facilities requiring phosphorus removal	20
i)	Number of facilities with phosphorus removal capability on line or under construction	5

Major municipal facilities are those with a rated capacity of 1 mgd or more.

Minor municipal facilities have a capacity rated at less than 1 mgd.

The Vermont Legislature mandated the removal of phosphorus from domestic laundry detergents in 1977. This action was expected to reduce the phosphorus content of domestic sewage by nearly one-half, an expectation which has been generally verified by sampling municipal wastewater pollution control facilities throughout the State. The Legislature simultaneously mandated phosphorus removal from municipal discharges to Lake Champlain and other waters designated by the Secretary in drainage basin management plans. Twenty plants have been so designated and five are now operational or under construction; all others are actively engaged in Step I or Step II planning. This State objective is expected to be achieved by 1984.

TABLE II

MAJOR MUNICIPAL DISCHARGERS

Barre City
Bennington
Brattleboro
Burlington(Main Plant)
Burlington(North End)
Burlington(Riverside)
Essex Junction
Hartford(White River Junction)
Middlebury
Montpelier
Newport
Northfield
Rockingham(Bellows Falls)
Rutland
St. Albans
St. Johnsbury
So. Burlington(Airport Pkwy.)
Springfield
Swanton
Windsor
Winooski

MAJOR NON-MUNICIPAL DISCHARGERS

American Optical Company (Brattleboro)
Boise Cascade, Incorporated (Brattleboro)
C.P.M., Incorporated (East Ryegate)
E.H.V.-Weidmann, Incorporated (St. Johnsbury)
Fairbanks-Morse, Division of Colt Industries (St. Johnsbury)
Georgia-Pacific Company (Lunenburg)
International Business Machines, Incorporated(Essex Junction)
Pownal Tanning Company, Incorporated (North Pownal)
Putney Paper Company (Putney)
Standard Packaging Incorporated, Division of Saxon Industries (Sheldon Springs)
U.S. Samica, Incorporated (Rutland Town)
Vermont Yankee Nuclear Power Corporation (Vernon)
Yankee Milk, Incorporated (Troy)

Delegation of Construction Grant Management Activity

Vermont executed a construction grant management delegation agreement with the U.S. Environmental Protection Agency on May 11, 1979. The delegations were to be assumed in three phases ending February 15, 1980 in the complete assumption of management activities. The first two delegation phases have been completed at this writing with notable improvements already realized in the expeditious processing of payments and change orders. The State's staffing commitments under 205(g) have been essentially met with 26 positions filled out of 29 positions required. All training has been completed.

Future management emphasis will focus on ordering procedures to insure timely completion of planning and administrative actions to expeditiously complete required projects. Added emphasis will also be placed on assisting small communities to comply with requirements of the act, and bringing their pollution abatement projects to completion at the earliest time. The latter may extend to acting in behalf of small towns in the local administration of their projects.

Operations/Maintenance/Surveillance

The oversight of operations and maintenance of municipal wastewater pollution control facilities has taken on added program emphasis within recent years and this trend will continue as overall program goals shift from capital construction to maintaining maximum pollutant removal efficiency and maximum effective useful life of treatment facilities. Table III summarizes the inspection and sampling effort which was made by the Operations and Maintenance Section in conjunction with the Water Resources Laboratory during Fiscal Year 1979.

TABLE III

SUMMARY OF COMPLIANCE
EVALUATION AND SAMPLING INSPECTIONS MADE
IN FISCAL YEAR 1979

1) Compliance Evaluation Inspections were performed:

- at 18 major municipal facilities
- at 0 minor municipal facilities
- at 18 major industrial facilities
- at 0 minor industrial facilities

2) Compliance Sampling Inspections were performed:

- at 18 major municipal facilities
- at 0 minor municipal facilities
- at 18 major industrial facilities
- at 0 minor industrial facilities

3) Operations and Maintenance Inspections were performed:

- at 18 major municipal facilities
- at 25 minor municipal facilities
- at 0 major industrial facilities
- at 0 minor industrial facilities

Performance audit inspections identified in the national strategy for FY1980 have not been undertaken to date, but will be initiated in coming years.

Recent national emphasis has been on the oversight of major facilities and substantially reduced emphasis on minor facilities. Major facilities in Vermont generally exhibit the most stable and dependable achievement of required effluent limits because major facilities serve a large enough population base to afford a full time operator of competency levels generally above that found in small towns utilizing only part-time operators. The bulk of Vermont treatment plants are of the minor category and it is in this area where future operations and maintenance surveillance will focus.

The future operations and maintenance emphasis must expand upon the scope and detail of technical assistance offered to municipal facilities' operators and local officials who are ultimately responsible for providing budget resources necessary to carry out a program of corrective measures. Operating costs are rising with energy costs and local officials will need assistance to operate treatment plants at optimum efficiency and minimum energy costs. Plants built 10 and 15 years ago are or will shortly be reaching their design life expectancy with little likelihood of financial assistance for capacity enlargement. Assistance to local officials is needed here in terms of greater in-depth technical evaluations leading toward means of maintaining effluent limits under the stress of increasing flows. The latter should provide sewer system/connection/flow management advice in addition to in-plant technical changes, to assure compliance with effluent limits into the future.

Operator training has been centralized under the control of the Rutland Regional Vocational Training Center where a program of courses will be offered to new entry and practicing operators in Rutland and in three satellite training centers throughout Vermont and individual training over the next three years. This program is funded under provisions of 109(b) of the Clean Water Act and is expected to become self-sustaining at the end of the three year period, as an organic component of the vocational/technical training programs of the State Department of Education. The program will supply all new entry operator requirements of the State during the grant period. The Operations and Maintenance Section will maintain an oversight, advisory role with respect to operator training during the coming years.

(B) Industrial

All industrial sources of pollution, with the exception of one cheese manufacturer waiting to discharge to an as yet not-constructed municipal wastewater treatment facility, have attained at least Best Practicable Treatment capability. Approximately thirty permits have been issued to industries discharging to municipal sewer systems in order to provide protection by requiring pretreatment or frequent monitoring to insure that the municipal wastewater facility is not upset by an unexpected discharge of industrial waste. The cheese manufacturer mentioned above is also being required to install pretreatment capability prior to construction of the municipal facility.

Although the cheese whey processing plant is not yet in operation the whey disposal problem has been reduced by a requirement that land spreading be limited to summer and fall months and a storage facility be provided for whey produced during the winter and spring.

The one unsolved problem with regard to industrial waste and the cheese manufacturing industry in particular is the problem created by the accidental or deliberate discharge of cheese whey or whole milk to the treatment facility. Only wash water is permitted to be discharged to the sewer and the occasional discharges of the stronger whey or milk generally upset the operation of the municipal facility.

A survey of the larger industries in the State for the discharge of toxic or hazardous wastes during 1979 failed to uncover any serious discharge problems. While spillage and occasional accidents may introduce small amounts of these dangerous wastes into the sewer system there appears to be no cases where a waste of this type is discharged deliberately or in any volume. Vermont is probably as close to 100% industrial waste treatment as any state in the country.

(C) Individual

Fifty percent of Vermont's population resides in rural areas where the only feasible means of controlling pollution is through the construction of septic tanks and leaching fields. Concerted efforts in the past have resulted in substantial abatement of these individual discharges. Approximately 30,000 septic tanks have been installed in rural Vermont since 1970.

Resources, Conservation and Development Districts and Environmental Agency Regional Offices provide direct technical assistance to individual rural homeowners in the siting, design, and construction inspection of on-site subsurface disposal systems.

The State of Vermont uses its subdivision law to control the pollution emanating from new sources being constructed in rural areas. No parcel of land in the State of Vermont of less than 10 acres may be subdivided without first securing a permit from the Agency of Environmental Conservation. A part of the review of an application, conducted by the Agency Protection Division, insures that the land is suitable for the construction of a septic tank and leaching field system or that other proper means of waste disposal are provided.

Since 1977 the 208 Program has sought to define an appropriate course of action to minimize the long-term water pollution consequences of unregulated private individual on-site system installation and maintenance. Between 1977 and 1979 the 208 program conducted four planning studies, each of which analyzed the State's management of on-site systems from a different perspective (e.g., technical standards, local administration, state coordination). Four draft plans for on-site wastewater disposal have been developed. The final draft is presently under review by the Vermont 208 Board and by the public.

As written the plan calls for an expansion of the Natural Resources Conservation District On-Site Sewage Program. The

plan's recommendations are for actions which encourage communities to accept the technical services of the on-site sewage program and, in this way, to upgrade the manner in which septic systems are installed and maintained. The plan calls for (1) local control of septic tank programs with State (On-site Program) assistance; (2) distribution of workbooks on rural sewage planning and management; (3) transfer of on-site wastewater disposal rule-making authority to the Agency of Environmental Conservation; (4) establishment of an On-Site Wastewater Disposal Advisory Committee under the Secretary of the Agency of Environmental Conservation; (5) certification of all individuals who submit on-site wastewater disposal plans for State approval; (6) statewide workshops for installers of on-site systems (7) increased enforcement and permit monitoring capabilities under the subdivision program; (8) conducting research on innovative on-site programs; and (9) conducting research on the adequacy of the State's ground water regulatory standards governing on-site waste disposal.

It is anticipated that the plan will be approved in its present form and certified by the Governor as Vermont's approach for mitigating on-site wastewater treatment system failure and related surface and ground water pollution. Appendix B is a copy of the On-Site Plan in its present form.

II. PERMIT PROGRAM (NPDES)

Vermont executed a memorandum of agreement with the U.S. Environmental Protection Agency on March 11, 1974 in which the Vermont permit program was accepted as equivalent to the NPDES program defined in Section 402 of Public Law 92-500. Under that program, permits were issued to all qualifying municipal and non-municipal dischargers, and during 1977, Enforcement Compliance Schedule Letters (ECSL) were issued to those qualifying permittees unable to achieve secondary treatment by the statutory objective of July 1, 1977. Passage of P.L. 95-217 authorized the selective extensions of permit schedules for qualifying permittees up to July 1, 1983 for achievement of secondary treatment under Section 301(i) and the issuance of administrative orders under Section 505 to those permittees unable to achieve secondary treatment by that date. Vermont completed action on all permittees in these categories in the spring of 1979.

Enactment of P.L. 95-217 required that the existing regulation and memorandum of agreement (MOA) be updated to reflect new requirements of the act, and that minor changes be made to Vermont statutes to gain conformity between State and Federal law. Those statutory changes, which specifically give Vermont permit issuing authority over Federal installations in the State, are now pending action before the Vermont Legislature. The regulation and MOA have been revised and are undergoing final review by the Vermont Attorney General, following which they will be respectively promulgated through Vermont's administrative procedures and signed by State and EPA officials.

Amendments to Vermont's permit enabling law 10 V.S.A., Chapter 47, enacted April 24, 1973, provided for issuance of pretreatment permits to those discharges to publicly-owned treatment works (POTW's) whose waste would interfere with the treatment process, pass through without treatment, or otherwise be injurious to receiving water quality. The Clean Water Act of 1977 carried similar authority and provided that a State's pretreatment permit program consistent with P.L. 95-217 could be accepted in lieu of a federally-operated program. Vermont made applications for program approval in spring 1979 an the memorandum of agreement is under review by the Vermont Attorney General and expected to be executed within the next few weeks.

Pretreatment permits under Vermont's law have been issued to all known industrial discharges falling within the above-defined categories, excepting one industry whose permit is under appeal. The latter permits were based upon an industrial waste survey of the State conducted by the Permits Section staff in 1969-1970. That survey was, in part, updated in 1979 by a survey of all 135 Vermont industries employing greater than 50 people. The survey activity included interviews with knowledgeable employees about the processes used, chemicals employed, disposition of all waste streams, solid and liquid, and the presence of toxics. Where liquid waste streams were discharged to surface waters or to POTW's, samples were taken and screened for several toxic metals. The survey was conducted in cooperation with the Agency of Environmental Conservation Solid Waste Section. Results of this survey are undergoing evaluation at this time to determine if pretreatment permits should be issued to new industries or if currently issued permits should be amended to reflect control of new pollutants or toxics. The industrial survey will be expanded in the future to evaluate those industries with less than 50 employees.

The control of toxic discharges is now limited by the ability of the State to analyze for a sufficiently broad spectrum of toxics. It is anticipated with expanding analytical capability in State laboratories or through cooperative arrangements with Federal laboratories, the toxics control measures now available through NPDES and the pretreatment permit program, could be employed to a greater degree.

Future activities of the permit program will include incorporation of sludge disposal requirements under Section 405 following promulgation of sludge disposal regulations now being drafted. This activity will be undertaken to incorporate toxic discharges controls by effluent limits or best management practices insofar as possible.

Other future activities will include amendment of pretreatment permits to reflect categorical industrial treatment standards as they are issued. Industrial permits issued to date have included a reopener clause allowing the Agency to amend ongoing permits to incorporate newly issued categorical pretreatment standards and allow reasonable time for planning anc construction to bring the permittee into compliance. This activity is expected to carry on for the next 2 to 4 years.

The enforcement of permit violations will continue to be undertaken in close coordination with the Vermont Attorney General. First and primary emphasis will continue to be on gaining voluntary compliance and secondarily, on legal action through the State's Attorney or Attorney General's Office. Early contact between permittees and the Attorney General's office has been expanded in the past few years to good effect and will continue in the future. Undertaking enforcement through the use of the administrative powers vested in the Agency Secretary under 3 V.S.A., §2833(a)(c) has proved an effective and economical means of achieving compliance short of court action and will be continued. Efforts are now underway to strengthen the settlement agreement under that section so as to permit violation of settlement agreements to be determined violations of a court approved settlement and therein subjected to direct court penalties.

Administration of the permit program in dealing with those permittees, who for reasons beyond their control cannot comply with the statutory deadlines of July 1, 1977 or July 1, 1983, has lead to issuance of documents which while legally correct in a technical sense, do not make sense to the general public or the permittees. Specifically at issue is the practice of carrying a reasonable attainment schedule up to the statutory compliance date and going silent on achievements beyond that date. Future efforts will be directed toward identifying means of controlling permittees' compliance from now through attainment of secondary treatment even if that is to be attained after 1983 due to unavailability of supporting construction grant funding. Public support for the program can only be maintained by making meaningful achievements which deliver demonstrable environmental benefit, and by conducting regulatory activities in a simple, straight-forward manner easily understandable by involved parties and the general public.

Permit issuing procedures are administratively cumbersome and time consuming, particularly for small permittees who have discharges of minor or negligible environmental impact, but which fall within the scope of the permit program. Currently all applications are processed the same and require about 2 months to issue a permit. Future efforts will be directed toward simplifying all permit issuing procedures and particularly those procedures for handling the small discharges. Vermont's permit

program deals with all discharges to State waters from nonpolluting rural uses such as foundation drains to individual households to major industries to municipalities. Simplifying procedures would make more effective use of limited and valuable staff time, would provide more reasonable service to the public and finally would permit greater effort to be placed on those permittees which have greatest potential environmental impact. Evaluations are currently underway with the Vermont Attorney General to identify means of accomplishing these ends. The issuance of general permits and the control of classes of discharges by means of regulation rather than permit now appears to be two fruitful areas of improvement.

III. NONPOINT SOURCES

The general term "nonpoint source pollution" pertains to all parameters orignating from diffuse sources that could be considered to be pollutants at certain levels of concentration. Prior to 1974, little was known about the impact of nonpoint sources of pollution on the quality of Vermont's waters. It was known that spring runoff and rainfall/runoff events increased the nonpoint source loadings of rivers and streams, but the magnitude of the loadings was not known, and the nonpoint source parameters worthy of concern were not identified. Since it would have been impossible to assess the impact of all nonpoint source parameters throughout the State, a preliminary evaluation of the water quality of the State was made to locate problems attributable to nonpoint sources. The results of the evaluation indicated that the primary nonpoint source problem was the accelerated eutrophication of Lake Champlain, Lake Memphremagog, and other smaller lakes and ponds caused by influxes of phosphorus and other nutrients in runoff.

Over the past few years, in-depth studies quantifying phosphorus and suspended solids loadings have been conducted by the Department of Water Resources in the Black River, Shelburne Bay and St. Albans drainage areas. These studies were concerned primarily with monitoring and quantification of phosphorus but additional studies inventorying land use and land use problems were conducted by the U.S.D.A. Soil Conservation Service and the Natural Resources Conservation Districts. This arrangement has proved to be very satisfactory as the phosphorus export was quantified by a qualified monitoring team while other local groups took in-depth looks into streambank erosion, soil loss and land use practices. The end result has been meetings with individual landowners and members of the local Natural Resource Conservation Districts where the specific pollution problems on each land holding have been discussed. This early involvement and person to person contact on the local level has met with wide acceptance on the part of the landowners and District Conservation Supervisors and has been, in our opinion, a better approach in dealing with agricultural nonpoint source pollution than visits from State employees or enforcement personnel.

The intensive monitoring of the Black River, St. Albans Bay and Shelburne Bay drainage basins was found to be very costly, but was important in that the studies proved to the general public that significant quantities of nonpoint sources of phosphorus from Vermont lands were entering Lake Champlain and Lake Memphremagog and hastening the trend toward eutrophication. In addition to the above studies, a survey of land use and farm practices was conducted on the Lower Winooski River where most of the concentrated agriculture in that particular basin may be found. This study, funded jointly by the 208 Program and the Lake Champlain Level B Study was valuable in that erosion and other pollution problems were noted in detail and the ground work has been set for individual visits by members of the the local Natural Resources Conservation District and the U.S. Soil Conservation Service. While the Lower Winooski Study lacked the monitoring and subsequently the quantification of phosphorus export from the basin, it was a very beneficial study in that nonpoint source problems that needed attention were identified.

Reports on the studies conducted on Shelburne and St. Albans Bays are available through the Vermont Department of Water Resources. The report on the Black River Project will be available in early 1980. Further information on nonpoint source studies mentioned above are available through the Soil Conservation Service in Burlington, Vermont and the Orleans County Natural Resources Conservation Districts.

Based on the nonpoint source studies to date, the following general conclusions have been drawn with regard to nonpoint source phosphorus in Vermont:

1) Soil and nutrients lost from cultivated crops appear to be the major source of nonpoint source phosphorus in the basins studied.

2) Phosphorus contributions from logging areas are much higher than contributions from undisturbed forest land.

3) Manure under certain conditions of storage and application can be a significant source of instream phosphorus.

4) Highway and other types of construction are, in many instances, contributors of large quantities of sediment. While the long term water quality (eutrophication) impact of these activities is not as great as with land that is under cultivation, the localized impact of the sediment on the aquatic biota is usually much greater.

5) Estimates of nonpoint phosphorus loadings based on land use and literature values are inaccurate unless an accurate determination of transport from the source to the area of the water quality problems can be made.

6) In some instances, significant amounts of phosphorus appear to be lost in the transport system as phosphorus is transported downstream. While the quantity lost varies with the inherent characteristics of the stream, it appears that phosphorus sources closest to the water quality (eutrophication) problem should receive the highest priority for control.

Methods of minimizing soil and nutrient losses are well known and the expertise on a limited manpower scale is currently available to disseminate this knowledge. The Department of Water Resources has a brochure available "Vermont Water Pollution Control in 1978, 1979, 1980 and Beyond ...is Looking at the Land" which acquaints the layman with nonpoint source terminology and through sketches acquaints him with the problem. The Best Management Practices most beneficial to Vermont agriculture and forestry have been identified and are presented in the 208 agricultural plan and forestry plan, respectively. Erosion control during construction activities is receiving careful scrutiny under the State's major land use control measure Act 250.

As mentioned previously, the primary nonpoint source problem areas have been identified as Lake Champlain and Lake Memphremagog and their drainage basins. These major lake basins have been further broken down into major river and minor lake basins and are presented below in priority order for the implementation of Best Management Practices through cost sharing and other assistance programs.

1) St. Albans Bay/Lake Carmi Drainage Area
2) Black River/Lake Parker Drainage Area
3) Shelburne Bay Drainage Basin
4) Otter Creek Drainage Area
5) Winooski River Drainage Area
6) Barton River Drainage Area
7) Lamoille River Drainage Area
8) Missisquoi River Drainage Area
9) Clyde River Drainage Area

The priority list was based on existing water quality problems. Applications for Federal funding under the Rural Clean Water Program have been made for the St. Albans/Lake Carmi drainage areas and for the Black River/Lake Parker drainage areas to financially aid farmers in the implementation of Best Management Practices. Alternate funding under P.L. 83-566 is being sought for the other priority basins through cooperation with the U.S.D.A. Soil Conservation Service. An intensive ten- to twelve-year monitoring program is being conducted on the LaPlatte River Basin (the major tributary to Shelburne Bay) and is being funded by the U.S.D.A. Soil Conservation Service under P.L. 83-566. It is our opinion that the general relationships between land use and water quality revealed by the Black River study will be applicable throughout Vermont.

The monitoring study on the LaPlatte River will yield information on the water quality response to improved land management practices. The State would prefer to see future nonpoint source monies spent on land and management improvements and not monitoring as a direct connection between nonpoint sources of nutrients and water quality has already been made in the several studies conducted in Vermont and in many studies throughout the nation.

The U.S. Soil Conservation Service in cooperation with the U.S.D.A. Forest Service and the Economics, Statistics, and Cooperative Service of the U.S.D.A. is studying soil loss in small sub-basins of watersheds 4-9 above. The Agency of Environmental Conservation has endorsed this project and cooperates in an advisory capacity.

The major objective of this project is to establish planning priorities so that State and Federal assistance can be allocated in accordance with the severity of the nonpoint problem in a subwatershed. The study will involve collecting watershed information and quantifying erosion, sedimentation and animal waste problems. The study will focus on the development of alternative management plans to reduce nonpoint source pollution from cropland and animal waste and on the evaluation of the economic and environmental impact of the alternative plans. Cost estimates will be developed for implementing Best Management Practices in those watersheds where applications for funding from programs such as P.L. 83-566 and the Rural Clean Water Program might be made.

The general trend in nonpoint source work in Vermont from 1980 to 1985 will be that of shifting from planning to the implementation of plans. This will be especially true in the area of agriculture and true to a lesser extent in the forestry area as large anticipated increases in timber harvesting will require planning to control associated nonpoint source problems.

IV. URBAN RUNOFF

In 1978, a stormwater task force was organized to take an indepth look into the literature on urban stormwater pollutants and develop a program to address the problem. The Urban Stormwater Program, the objectives of which are listed below, was developed by the task force.

VERMONT URBAN STORMWATER PROGRAM

Target Dates	Objectives
1978	1. Set forth Interim Stormwater Management Policy (Appendix C) to slow the increase of stormwater pollution in Vermont. (The interim policy based treatment levels on the size of the paved parking area for the initial ease of administration under the Vermont permit program).
1979-1980	2. Evaluate paved areas subjected to diverse uses, i.e., shopping centers, high volume streets, low volume streets, fast food restaurants, motels, and gas stations to determine if the policy should require treatment based on use rather than size, or a combination thereof. Begin broad spectrum analysis of suspected problem parameters and priority pollutants.
1980-1983	3. Evaluate a portion of these treatment systems in place and determine treatment efficiency. Determine the relationship between the untreated pollutant concentration and the runoff hydrograph at various sites.
1979-1983	4. Revise Interim Stormwater Management Policy as new information becomes available.

The Interim Stormwater Management Policy was developed based on information contained in the literature. The task force found it very difficult to compare the various studies, but did find basic agreement in several areas. The concensus was as follows:

1) The vast majority of pollutants move in the first runoff flush of the area.

2) Urban stormwater runoff contains a significant nutrient load and in some instances highly toxic materials.

3) The most potentially hazardous pollutants in urban stormwater are either in solution or present as extremely fine suspended particles that do not settle readily.

Since the initial policy development was based on literature and not actual studies in Vermont, there has been considerable uncertainty as to the magnitude of the stormwater problem or the degree of treatment needed in Vermont. Basically, the policy recognized that it was impossible to deal with existing municipal stormwater problems without Federal program monies to share in construction costs. Vermont, through the interim policy, has attempted to slow the growth of the stormwater pollution problem by shifting the responsibility of stormwater treatment to the developer or owner rather than the municipality. Treatment requirements for stormwater ranging from deep sump hooded catch basins for paved roads and small parking areas to the slow filtration of the first one-half inch of runoff for larger paved areas on all new construction. The level of stormwater treatment must be such that the discharge meets the Technical Requirements of the Water Quality Standards for the particular type and class of the receiving water. Policy requirements are administered through the State administered permit process with each stormwater discharge receiving a permit containing requirements for the type of system, maintenance, and report of maintenance. Pollutants of concern include oxygen demanding materials, nutrients, pH, turbidity and suspended solids, heavy metals, oil and grease and toxic substances.

Vermont has developed and submitted to EPA a grant proposal under the National Urban Runoff Program to further expand its understanding of urban runoff. Under the National Urban Runoff Program, Vermont proposes to:

1) Assess the efficiency of various types of stormwater devices that are in use.

2) Determine the ralationship between selected pollutant concentration and the runoff hydrograph from the various study sites. This information is needed so that the policy can be amended to reflect adequate types and levels of stormwater treatment. This proposal dovetails with the Vermont Urban Stormwater Program by fulfilling the goals of Objective 3.

As envisioned, both flow proportioned composite samples and discrete samples collected from various types of treatment systems at varying locations will be taken during the project and analyzed for the following parameters:

Solids: Total suspended
Total fixed
Total volatile

Nutrients: Ammonium nitrogen
Nitrite-nitrate nitrogen
Total Kjeldahl nitrogen
Total phosphorus
Ortho phosphorus
Total dissolved phosphorus

Physical: Turbidity
Oil & Grease

Metals (total and dissolved):

Zinc	Copper
Lead	Iron
Cadmium	Chromium

Bacteria: Fecal coliform

Priority toxic pollutants

Samples will be collected and analyzed in accordance with strict quality assurance measures, and the data will be analyzed to (1) assess the efficiency of various types of stormwater treatment devices and to (2) determine the relationship between selected pollutant concentrations in the runoff hydrograph at different locations during many different events. Based on this information, the Interim Stormwater Management Policy will be modified and will outline approved stormwater treatment devices, design requirements, and the portion of the runoff event requiring treatment. The institutional arrangements under which the stormwater policy and treatment requirements are administered will be presented along with cost estimates for the design, construction and maintenance of the various treatment systems.

If approved, work will begin on or before July 1, 1980 and terminate on June 30, 1983. This study duration will provide over two years of actual monitoring data and allow for the physical operation of treatment systems to be observed for approximately three years.

V. PLANNING AND MANAGEMENT ACTIVITIES

(A) Water Quality Standards

The Vermont Water Quality Standards dated March 7, 1978 are currently in the process of review and revision. The primary focus of the review is to assure the clarity and workability of the Standards.

Three reclassifications have been made by the Vermont Water Resources Board since January 1978. Approximately two miles of streams were reclassified from Class B to Class C to accommodate treated municipal wastewater discharges. Approximately 3.75 miles of stream were reclassified from Class A to Class B as no longer being necessary for water supply protection.

Since January 1970, almost 50 miles of streams have been reclassified from Class B to Class C to accommodate treated wastewater discharges. About one-half mile of Class C stream was reclassified to Class B to account for a change in location of a wastewater discharge. Three and three-quarter miles of Class A stream was reclassified to Class B as stated above and about 2.7 acres of Class B lake area was reclassified to Class C to accommodate wastewater discharges.

Table IV lists the reclassifications which were ordered by the Vermont Water Resources Board from January 1970 to January 1980.

Many miles of Class C streams classified in original classification orders in the 1950's and 1960's are no longer appropriate since the required minimum wastewater treatment has been increased. The River Basin Water Quality Management Plans prepared in the 1970's recommend reclassification of such Class C areas to Class B.

Currently in preparation is a document which will list the current classification of each water body in the State, along with recommended changes and a State map showing the location of Class A and Class C areas.

(B) Combined Sewer Assessment

No progress has been made in combined sewer assessment in the fourteen communities identified as having major overflow problems. The following lists the communities with major combined sewer overflow problems:

1. Burlington(8-6 and 5-5)
2. Winooski (8-6)
3. Newport(17-3)
4. Essex Junction (8-6)
5. St. Albans (5-3)
6. Vergennes (3-7)
7. Middlebury (3-6)
8. Rutland (3-3)
9. Montpelier (8-3)
10. Barre (8-9)
11. St. Johnsbury (15-3)
12. Bennington (1-4)
13. Springfield (10-8)
14. Bellows Falls (13-2)

Lack of resources to perform an assessment of impact on water quality from overflows in the communities and a low funding priority for sanitary/storm sewer separation has resulted in no progress in resolving this problem.

TABLE IV

VERMONT STREAM AND LAKE RECLASSIFICATIONS

JANUARY 1970 to JANUARY 1980

BASIN #	STREAM/LAKE DESCRIPTION	RECLASSIFICATION	DATE	LENGTH (miles)
2	Trib. to Hubbardton River at Benson	B to C	4/25/74	3.0
2	Lake St. Catherine at Lake St. Catherine Inn	B to C	1/25/77	50 ft. radius
2	Indian River at N.Y. State Border	B to C	2/11/80	20 ft.
3	Trib. to Otter Creek at Otter Valley Union High School	B to C	6/26/74	1.0+
4&5	South Fork of East Creek	B to C	4/22/75	2.3
4&5	Lake Champlain/Malletts Bay at Brown Ledge Camp	B to C	1/28/75	100 ft. radius
4&5	Lake Champlain at Alburg	B to C	10/10/76	50 ft. radius
4&5	Trib. to Rugg Brook Air Force Station/St. Albans	B to C	3/24/77	1.5+
7	Lamoille River, Fairfax STP	B to C	8/10/77	1.5
7	Lamoille River	C to B	8/10/77	0.6
8	Airport Brook & Pond Brook	A to B A to B	1/18/80 1/18/80	2.25+ 1.5+
9	White River, First Branch at Chelsea	B to C*	12/28/77	2.0
9	White River, Third Branch at Randolph	B to C*	12/28/77	1.2
9	White River at Bethel Fish Hatchery	B to C*	12/28/77	100 yds.
9	White River at Bethel	B to C*	12/28/77	3.0
9	White River at South Royalton	B to C*	12/28/77	1.4

\+ = Approximate

* = Reclassification from Legislative Class B

TABLE IV (continued)

BASIN #	STREAM/LAKE DESCRIPTION	RECLASSIFICATION	DATE	LENGTH (miles)
10	Ottauquechee River at Sherburne	B to C**	6/22/77	2.0
11	Williams River at Chester	B to C*	11/29/72	2.0
11	Saxtons River at Saxtons River	B to C*	7/26/78	2.0
12	Harriman Reservoir at Whitingham	B to C	6/22/77	150 ft. radius
15	Passumpsic River, East Branch at Hartwellville	B to C*	4/28/76	1.2
15	Passumpsic River at Lyndonville	B to C*	4/28/76	4.4
15	Passumpsic River at EHV-Weidmann	B to C*	4/28/76	0.9
15	Passumpsic River at St. Johnsbury	B to C*	4/28/76	4.8
15	Moose River at Fairbanks-Morse	B to C*	4/28/76	1.1
15	Water Andric Brook at Danville	B to C*	4/28/76	3.8
17	Tomifobia River at Derby Line	B to C*	6/9/71	0.25
17	Barton River at Barton	B to C*	2/20/75	3.2
17	Barton River at Orleans	B to C*	2/20/75	2.0
17	Roaring Brook at West Glover	B to C*	2/20/75	3.0
17	Clyde River at Newport City	B to C	2/20/75	0.25
17	Pherrins River at Island Pond	B to C	2/20/75	500 ft.
17	Clyde River at Island Pond	B to C	2/20/75	1.5

*=Reclassification from Legislative Class B
**=Seasonal

(C) Discharge and Temporary Pollution Permits

The Water Quality Division of the Department of Water Resources reviews all discharge and temporary pollution permits for compliance with the Vermont Water Quality Standards.

(D) 201 Facility Planning

In accordance with Vermont's Agreement with EPA on the Section 205 delegation, the Environmental Engineering Division of the Agency of Environmental Conservation has agreed by memo dated 1/24/80 to coordinate the Step I planning process with the Water Quality Division. This coordination will include consultation on water quality studies to be included in the Step I planning process or to be performed in conjunction with the Step I process. Also, Preliminary Engineering Reports (Step I Facilities Plans) will be reviewed by the Water Quality Division and, if appropriate, the Water Quality Division will be represented at environmental assessment hearings or other hearings on facilities plans.

(E) 208 Program

Since issuance of the last Vermont 305(b) Report, the 208 Program responsibility has been transferred from the Agency Planning Division to the Water Resources Department, Water Quality Division. This has resulted in closer coordination of the 208 Program with on-going Division activities.

(F) Vermont Water Resources Planning and Management Program

What started as a list of River Basin Planning Needs has now evolved into the Vermont Water Resources Planning and Management Program. This "program" lists the problems and potential problems in both the planning and management areas, states the tasks to be accomplished, identifies possible funding sources and cites a contact person for the particular problem. Much work needs to be done on this program, particularly a frequent review and update, to enable its full utilization in developing State strategies, needs lists, State-Regional Administrator Agreement, Water Resources Council Title III Program and the State 106 Program Plan.

(G) Policies

The Vermont Agency of Environmental Conservation has developed several policies which are intended to protect water quality:

1) Desilting Policy (January 1980)(Appendix D)

This policy makes very clear that any desilting operations behind dams must receive a review and/or permit by the Agency of Environmental Conservation under one of several statutes.

2) Municipal Facility Connection Policy (November 1975) (Appendix E)

This policy provides guidance for reviewing applications which add an additional flow and waste loads to municipal waste water treatment facilities. The policy essentially prohibits approval of new connections to treatment facilities where there is no reserve capacity. The policy needs revision to initiate a process of planning to upgrade or expand wastewater treatment facilities when the facility reaches 80% of its capacity or at a point where there is sufficient time for the facility to be modified before it reaches design capacity.

3) Streambank Maintenance Policy (in preparation)

This policy provides guidelines for streambank maintenance to prevent erosion, pollution and to provide good wildlife habitat.

VI. MONITORING

Vermont's water quality monitoring programs continue to be an integral aspect of the State's water pollution control program.

Compliance monitoring continues as a major aspect of Vermont's water monitoring program. This monitoring program is directed towards the verification of effluent quality reported by municipal and industrial wastewater pollution control facilities discharging under authority of either an NPDES permit or a State discharge permit. Compliance monitoring is undertaken at all major municipal wastewater pollution control facilities (21) and all major nonmunicipal wastewater pollution control facilities (13) discharging to waters of the State. Table II of this document lists those major municipal and nonmunicipal facilities sampled in conjunction with compliance monitoring. A concerted effort has been made to sample all permitted pretreatment facilities discharging to these major municipal and nonmunicipal facilities. Ten percent of all remaining municipal and nonmunicipal facilities (minor) undergo compliance sampling yearly. Under this sampling scenario, almost all minor facilities are sampled once in five years.

Vermont has continued to devote many manhours to cause/effect monitoring (intensive surveys) for assimilative capacity-wasteload allocation. Surveys for three river segments studied by the Department of Water Resources - (1) Winooski River below discharge from IBM to confluence with Lake Champlain (approximately 12 miles); (2) Stevens Branch below discharge from Barre City to its confluence with the Winooski River and (3) Otter Creek - Rutland City to Pittsford have been completed for both calibration and verification of the computer models. Data reports for each of these river segments have been prepared and are available from the Water

Quality Division, Department of Water Resources. Preliminary wasteload allocation schemes have been developed for Otter Creek. Similar wasteload allocation schemes for the Winooski River and Stevens Branch are to be developed in the near future.

Vermont has continued to operate two stations as part of the "Basic Water Monitoring Program - Core Network Stations". The location of these two stations are (1) Lake Memphremagog and (2) Lower Winooski River. Each station is being sampled in accordance with the outlines set forth in the Basic Water Monitoring Program document. Four additional stations will be made operational in the spring of 1980 giving Vermont a total of 6 "core stations" and thus meeting its required number of stations.

The monitoring requirements of the"core network stations" as outlined are quite rigid and in some instances beyond the immediate personnel and equipment capabilities available to the State (e.g. trace organic analysis, fish tissue banking program). Vermont must continue to request that it have the ability to develop the sampling program for its "core stations" within its personnel, equipment and economic resources as well as needs.

A pre-post phosphorus detergent ban study has been conducted on Lake Champlain, Lake Memphremagog and two inland lakes during 1977-1979. Samples were collected either once or twice weekly from selected stations in each water body and analyzed for chlorophyll and total phosphorus. Additional studies were conducted at selected wastewater pollution control facilities before and after ban implementation to evaluate the effectiveness of the ban in reducing levels of phosphorus being discharged.

Preliminary assessment of the data from wastewater pollution control facilities showed a fifty-seven percent reduction in the total phosphorus concentration and fifty-eight percent reduction in total phosphorus loading form eight facilities sampled. Evaluation of the lake data has not been undertaken at this time. Data collection for this study will continue until 1981 with final report preparation in early 1982. (Refer to Appendix F)

The issue of potential chlorine toxicity is of great concern in Vermont, especially in those waters which support salmonids for sport fishing. The available technical literature is quite clear in that environmental damage can occur when in-stream total residual chlorine levels exceed 0.002 mg/l in receiving waters supporting cold-water fisheries and 0.01 mg/l in receiving waters supporting warm-water fisheries.

The Department of Water Resources and the Biological Section of EPA Region I laboratory participated jointly in a study of the acute toxic effects of a chlorinated primary sewage effluent from Manchester, Vermont on brown trout and brook trout in the Batten Kill River. A detailed report of this study is available from the New England Regional Laboratory - Region I.

Vermont's Monitoring and Special Studies Unit during the summer of 1979 continued with its assessment of chlorinated discharges on natural stream environments. Data from this study is not yet available but will be utilized in future discussions of the State's Chlorine Task Force Committee. Issues remaining for consideration before the Committee include (1) seasonal chlorination; (2) uniform analytical procedures; (3) improved contact chamber and chlorination system design; (4) establishment of a statewide total residual chlorination level vs individual facility TRC levels.

VII. CLEAN LAKES PROGRAM

The 1977 Vermont Water Quality Assessment (305(b) Report) described the Vermont Lakes and Ponds Program. This program was slightly modified and publicized in the document Vermont Lakes and Ponds Program, 1978, Water Quality Surveillance Series Report Number 5 by the Vermont Department of Water Resources.

In 1979, the Department of Water Resources formed the Lakes and Ponds Management Program whose prime responsibility is for the management programs dealing with Vermont lakes. The Lakes and Ponds Program delineates three major phases of lake investigatory work and a series of satellite programs designed to gather information useful in developing efficient means for monitoring trophic and other changes in lakes. The entire Vermont Lakes and Ponds Program was presented in a paper delivered at the E.P.A. Lake Restoration Conference in Minneapolis during 1978, proceedings of which are available for the Environmental Protection Agency.

The objectives of the first phase of the lakes program are to monitor the water quality by the collection and analysis of basic limnological data, and to identify those lakes which may be experiencing water quality problems. In 1978, 47 lakes were sampled for bacteriological and basic limnological data, and in the summer of 1979, 38 lakes were sampled. Further in 1979, ten areas of Lake Champlain were added to the program. Bacteriologically speaking, the areas of Lake Champlain were found to have a lower water quality than the smaller Vermont lakes. This is a problem which will be dealt with in upcoming years by intensifying the Lake Champlain effort.

The objectives of the second phase of the Lakes and Ponds Program are to establish the most sensible recreational potential of a lake which has been selected through the Phase I program as having possible water quality problems. The studies involved in Phase II are detailed and usually provide the necessary data involved in obtaining either a Phase I or a Phase II grant under Section 314 of P.L. 92-500. In addition, these studies meet the State of Vermont's requirement for a biological study prior to release of funds made available through the Vermont Aquatic Nuisance Control Program. They thus provide the basis for local and state participation in state and federally-funded lake management and restoration projects. Generally, water quality reports are made available on these lakes for which a Phase II study has been conducted. To date, thirty-four Phase II studies have been completed and sixteen reports are available. Abbreviated reports will be made available on the remaining lakes.

Vermont's Phase II program is in large part identical to the Phase I diagnostic feasibility studies funded under Section 314 of P.L. 92-500. These studies will be funded on a 70-30 percent basis when the new Federal regulations are promulgated. This will mean that Vermont will be able to take advantage of the funding process to financially assist studies which are already an integral part of the Vermont Lakes and Ponds Program. Vermont is currently involved in three Clean Lakes Grants (314).

The Lake Bomoseen Weed Harvesting Project is a $150,000 three year project to rid Lake Bomoseen of nuisance aquatic vegetation. The Lake Bomoseen Project was the first Clean Lakes Grant awarded to Vermont and the financial obligations are being shared by the Environmental Protection Agency (50%), the Vermont Department of Water Resources (25%), the Town of Castleton (12.5%) and the Bomoseen Lake Association (12.5%). The project is in its third and final year, and according to recent questionnaires, has been extremely successful. The Department of Water Resources will be preparing a final report during 1980 which will summarize all work related to the harvesting project and will report on the scientific value of using weed harvesting as a lake restoration tool.

The Vermont Lake Classification Grant is the second Clean Lakes Grant awarded to the Department of Water Resources. It is a $143,000 project designed to classify Vermont lakes and prioritize them according to restoration and protection needs. Although EPA's principle objective is for Vermont to establish the trophic status of Vermont lakes, Vermont continues to maintain that from trophic status alone it cannot be used to determine restoration needs. Vermont emphasizes that only through the determination of excessive cultural influences can these needs be formulated. Drainage basin maps for all lakes in the State are being digitized for use with computer compatible Landsat tapes. Through computer programs lake drainage basin boundaries and the land use with the drainage basin will be delineated. It is through use of Landsat that the Department of Water Resources will be able to keep track of changing cultural influences within the lake's drainage basins. The Lake Classification Grant will be completed during 1980.

The Harvey's Lake Grant is the third and most recent Clean Lakes Grant awarded to the Vermont Department of Water Resources. This grant is a three year $82,000 project which will study methods of alleviating a severe algal situation in Harvey's Lake. Harvey's is a large clean lake with an important lake trout fisheries. Large populations of blue-green algae, Oscillatoria pose a threat to the fisheries, and the feasibility of altering the types of algae in the lake in order to favor a more beneficial one, will be the object of the Harvey's Lake Grant.

In addition to the Clean Lakes Grant, the Department of Water Resources awards funds to municipalities for the purpose of controlling aquatic nuisances. The Aquatic Nuisance Control Program was initiated in 1978, and to date the Department has awarded $34,000 to five municipalities. State funds for the control of aquatic nuisances are provided for under statutory authority 10 VSA, §921-923. A copy of this legislation is attached as Appendix G.

The Aquatic Nuisance Control Program has now become the mechanism by which the Department of Water Resources will request funds for all lake restoration projects. The Water Resources budget for 1981 includes a request for $185,000 to cover all lake programs. This figure includes monies for various purposes. Match monies in the amount of $51,000 will be used for Clean Lakes Projects with E.P.A. These projects will include continuation of the Lake Bomoseen Grant and the Harvey's Lake Grant, and will fund the first year of a new Clean Lakes Project. A first year match of $114,000 will be used for a ten year project in conjunction with the U.S. Army Corps of Engineers. This large $1,000,000 project currently being reviewed by the Corps, if awarded, will provide weed harvesting in areas of Lake Champlain currently being degraded by nuisance vegetation. The initial areas of the lake to be harvested will be in the areas of the south lake innundated with water chestnut and in St. Albans Bay where Myriophyllum sp. is a serious problem. The remaining $20,000 will be used to match municipalities who have requested funds from the Vermont Aquatic Nuisance Control Program.

There are a number of satellite programs in the Vermont Lakes and Ponds Program designed to gather information concerning the changing trophic status of Vermont's lakes. These programs have involved the simplistic relationships between dissolved oxygen, springtime phosphorus concentrations, average summer chlorophyll-a concentrations and average Secchi disk readings. The programs have been ongoing since 1977 and have proven to be useful in determining trophic states relative to a large number of lakes. It is this information which will be combined with the land use data acquired from Landsat to give the completed picture of both what the trophic state of the lake is and how much is due to cultural influences.

In 1978, the Department of Water Resources initiated the Lay Monitoring Program in which private citizens are involved in collecting similar information and this has allowed the Department to greatly expand this monitoring program. The Lay Monitoring Program was extremely successful in 1979 and 33 lakes plus 19 portions of Lake Champlain were monitored weekly by over 150 persons. The Lay Monitoring Program is currently being added to the Vermont Lakes and Ponds Program as a permanent feature. Listed in Table V are those lakes participating in the Lay Monitoring Program.

In addition to data collection useful in monitoring trophic changes, the Vermont Department of Water Resources is working closely with both NASA and EPA in making Landsat imagery useful for measuring trophic changes. The Landsat work is a major part of the Vermont Lake Classifications Grant. The Lay Monitoring Program will be used to provide ground truthing for the imagery.

TABLE V

LAKES PARTICIPATING IN THE LAY MONITORING PROGRAM

INLAND LAKES	TOWN
Averill	Averill
Beebe	Hubbardton
Bomoseen	Castleton, Hubbardton
Burr	Sudbury
Carmi	Franklin
Caspian	Greensboro
Dunmore	Salisbury, Leicester
Echo	Charleston
Elmore	Elmore
Fairlee	Fairlee, W. Fairlee, Thetford
Forest	Calais, Woodbury
Greenwood	Woodbury
Groton	Groton
Hall's	Newbury
Harvey's	Barnet
Hortonia	Sudbury, Hubbardton
Iroquois	Hinesburg, Williston
Island	Island Pond
Joe's	Cabot, Danville
Maidstone	Maidstone
Mirror	Calais
Morey	Fairlee
Parker	Glover
Raponda	Wilmington
Rescue	Ludlow
St. Catherine	Poultney, Wells
Salem	Derby
Seymour	Morgan
Shadow	Glover
Star	Belmont
Sunset	Benson, Orwell
Valley	Woodbury
Woodbury	Woodbury

LAKE CHAMPLAIN - 19 STATIONS

Whitehall	Corlear Bay	The Gut
Larrabee's Point	Colchester Shoal	Georgia Shore
Crown Point	Outer Malletts Bay	St. Albans Bay
Thompson's Point	Inner Malletts Bay	Butler's Island
Shelburne Bay	Milton Shore	Point Au Fer
Burlington Harbor	Treadwell Bay	Missisquoi Bay
		Keeler Bay

VIII. ASSIMILATIVE CAPACITY-WASTELOAD ALLOCATION

Historically, discharges of domestic and industrial waste have not been of sufficient magnitude to create substantial biochemical oxygen demand, dissolved oxygen or solids problems in the receiving waters of Vermont. Wasteload allocations have not been a critical factor in the design of treatment facilities in the past. Preliminary assessment of future design wasteloads and receiving water assimilative capacities under 7Q10 conditions indicates that several receiving waters could develop significant dissolved oxygen deficits at design treatment loadins.

Intensive surveys for wasteload allocations were conducted on three rivers during 1978 and 1979 to verify preliminary assimilative capacity assessments for receiving waters where existing or future design waste loadings could develop significant dissolved oxygen deficits. The Otter Creek, Lower Winooski River and the Steven's Branch of the Winooski River were studied by the Department of Water Resources in 1978 and the Lower Winooski River and Steven's Branch was studied in 1979.

The Department of Water Resources adopted a wasteload allocation process in November 1978 in order to provide a fair distribution of waste assimilation capacity among all dischargers in a Water Quality Limited Segment. The wasteload allocation process on Otter Creek is almost completed while the process on the Steven's Branch and Lower Winooski River is still in the early stages.

Table VI lists those receiving waters that will require additional water quality studies for calibration and verification of assimilative capacity assessments.

Wasteload allocations in the future will include allocations of nutrients for those segments draining into lakes in addition to the allocation of oxygen demanding wastes.

The wasteload allocation process currently being used in Vermont for making wasteload allocations is outlined in the document attached as Appendix H.

TABLE VI

RECEIVING WATERS REQUIRING ADDITIONAL WATER QUALITY STUDIES
FOR DETERMINATION OF FUTURE ASSIMILATIVE CAPACITY CAPABILITIES

1980 ORDER OF PRIORITY	RIVER BASIN	SEGMENT	DESCRIPTION	PRESENT MODELLING STATUS
1	Winooski River	Main Stem (8-6)	Below discharge from IBM to confluence with Lake Champlain.	Calibration and Verification Data Complete-Load Allocation Being Assigned.
		Stevens Branch (8-9)	Below discharge from Barre City to confluence with Winooski River.	Calibration and Verification Data Complete-Load Allocation Being Assigned.
2	Otter Creek	Main Stem (3-3)	Below Rutland City discharge to confluence with Lake Champlain.	Calibration and Verification Data Complete-Load Allocation Being Assigned.
3	Connecticut River	Main Stem	Upper Ammonoosuc to Comerford Dam.	Verification
4	Walloomsac River	Main Stem (1-4)	Below discharge from Bennington to New York State Line.	Calibration Data Complete.
5	Poultney River	Main Stem	Poultney to the Castleton River	
6	Hoosic River	Main Stem (1-2)	Below Pownal Tannery to New York State Line.	
7	Lake Champlain	Laplatte River	Below discharge from Hinesburg to Lake Champlain.	

IX. OIL AND HAZARDOUS MATERIALS

During 1978, 114 oil and hazardous materials spills were reported to the Agency of Environmental Conservation. Of those, 51 reached the surface waters and 18 reached the ground waters of the State. In 1979, there were 146 such spills reported, of which 73 reached the surface waters and 9 reached the ground waters. These were investigated by the Agency's Hazardous Materials Section and/or the Regional Water Resources Investigators. Response activities include advising the responsible party on spill control, cleanup, and disposal activities. On-site monitoring was continued as necessary. Reports on spill incidents were written and forwarded to the proper State's Attorney for possible prosecution under Section 1259 of the Vermont Water Pollution Control Statutes. Coordination is maintained with the Surveillance and Analysis Section of the U.S. E.P.A. during a spill event.

Slide presentations concerning oil and hazardous materials emergency response activities will continue to be made to various State agencies, environmental organizations and the fire service agencies around the State. The Vermont Fire Fighters and Fire Chiefs Associations will continue to work with the Hazardous Materials Management Section in developing standard operating procedures for water quality accident responses.

As a result of a Task Force on Environmental Emergencies in Vermont, legislation dealing with the Transportation of Hazardous Materials was developed. This legislation, 3 V.S.A., §3116-3117, adopted U.S. D.O.T. Hazardous Materials Regulations and established a Vermont Committee on Hazardous Materials. The Agency of Environmental Conservation is represented on that committee by the Chief of the Hazardous Materials Management Section. There will be a greater emphasis on overall coordination of various types of environmental emergencies especially in the area of chemcal spills. The Vermont Hazardous Materials Committee has proposed an executive order to designate responsibilities of various State agencies involved in a spill incident. The Hazardous Materials Management Section of the Vermont Agency of Environmental Conservation has recently hired a chemist as Oil and Hazardous Materials Specialist. This will provide expanded resources for dealing with chemical incidents.

The Hazardous Materials Management Section has been made a part of the Air and Solid Waste Programs and is designating disposal sites for oil saturated debris as an ongoing project. This section is currently meeting with local officials to site landfills suitable for disposal of large amounts of oil-soaked debris in the event of a major oil spill on Lake Champlain. This section expects to use landfarming for disposition of this debris thereby eliminating the need for permanently dedicating an area of the landfill for disposal of oil-soaked debris.

The Hazardous Materials Management Section and the Water Resources Investigators assist the Surveillance and Analysis Section of EPA in inspecting and evaluating spill implementation for Non-Transportation Related On-Shore and Off-Shore Facilities located in Vermont.

The Oil and Hazardous Materials Contingency Plan for the Waters of the State of Vermont is currently undergoing major redevelopment to reflect hazardous materials environmental emergency response and will be ready for publication and distribution in early 1980. At that time, approximately 500 copies of the plan will be distributed to various agencies in Vermont.

Technical assistance in the laboratory, office and on scene at environmental emergencies has been and will continue to be expanded.

Attached are the Statistics Reports for 1978 and 1979 of oil and hazardous materials incidents in Vermont. (Appendix I),

X. WETLANDS

There have been three wetland inventories prepared by the United States Geological Survey, Vermont Fish and Game Department, and the Agency of Environmental Conservation Planning Division. The latter was conducted in 1979. It identified 4,578 sites, totalling 110,323 acres. These wetlands are distributed by size in the following pattern.

Size in acres	Number	Percent
0- 2	1,234	27.3
3- 5	1,093	24.3
6- 10	867	19.1
11- 20	589	13.0
21- 30	199	4.4
31- 50	188	4.1
50- 100	192	4.2
100+	154	3.4

In 1978, the Vermont Natural Resources Council funded a study of the extent of wetland alteration between 1937 and 1974. One hundred wetlands, representing 9.4 percent of the total state wetland area were surveyed. Seventy-three percent of the wetlands were altered in some way. The Vermont Natural Resources Council study estimates that by the year 2001 all of the sampled wetlands will have been altered in some way. Specific alterations, as of 1974, included 88 roads, 35 bridges, drainage of 1,436 acres, 15 rights-of-way, 33 structures, 33 acres of filling, 10 moorings and wharves, 6 rail beds, 99 acres of logging, two acres of junkyards and 184 acres of flooded impoundments.

A wetlands protection bill (H.213) was introduced in the Vermont Legislature in 1979. This bill would require the Secretary of the Agency of Environmental Conservation to inventory and map significant wetlands and to interview wetland owners. It would further require the Secretary to report to the General Assembly on the findings and need and courses of action for wetland protection. It calls for an appropriation of $30,000 during Fiscal Year 1980 to implement the act.

XI. LAKE CHAMPLAIN PROGRAM

The Agency of Environmental Conservation recognizes the need for a program to address the special environmental management concerns for Lake Champlain and the surrounding shoreline.

Due to the sheer size of the lake and its complex morphologic configuration, an adequate data base is not available to accurately assess what nutrient control measures or other management actions are needed to control the eutrophication process in Lake Champlain. The lake level regulation issue elucidated the need for a comprehensive floodplain management program in order to minimize annual flood damages. Because the lake serves as a source of potable water for over one-quarter of the State's population and at the same time receives the waste discharges from more than 50 municipal waste treatment facilities in Vermont, there is increasing concern that such discharges may imperil domestic water supplies. There is also a critical need to assure that adequate public access and recreation facilities are provided so that the public can easily take advantage of the lake's diverse recreational opportunities.

Efforts are now being made by Vermont to establish a Lake Champlain Program in the Department of Water Resources.

XII. GROUND WATER

The State of Vermont's ground water quality is good except where waste disposal or other polluting activities of man have contaminated the shallow soils and the ground water in them. Because the water tables are near the surface and the soils often thin, there is little protection for ground water from surficial or near surface sources of pollution. At this time, there is limited data available to quantitatively determine the quality of the ground water in Vermont.

In order to protect its ground water resources, Vermont has recently switched its emphasis in ground water programs from one of locating high capacity aquifers to one of developing a plan for protection of the quality of ground water. This shift has been caused by the scattered demand for new large ground water supplies and by the growing number of reports of pollution. Looking at cases of ground water contamination and the lack of laws and regulations against most polluting activities, it is obvious that a statewide effort to establish a ground water protection and pollution control program is very much needed.

The decision as to what ground water should be protected and which method to use in a protection scenario has not yet been made in Vermont. Most Vermont ground water is better than U.S. E.P.A. established primary Drinking Water Standards but shallow water tables and permeable soils make ground water highly vulnerable to pollution. Vermont will probably develop a policy of limited degradation of its ground waters in specified areas coupled with a classification system recognizing the primary use of ground water as a source of drinking water.

The Department of Water Resources is actively engaged in several ground water monitoring programs which are outlined below.

A cooperative program between the U.S. Geological Survey and the Vermont Department of Water Resources measures monthly water levels in the 15 observation wells throughout the State. This monitoring network which began in 1956, with most of the wells established during 1966, is made up of gravel wells only. Temperature profiles of these wells which began in August 1979 are taken coincidentally with the monthly water level measurements. The average ground water temperature measured in these wells is approximately 46°F (7.8°C). Water levels typically rise in April and October in response to major recharge events and decrease during summer low flows and winter months when discharge exceeds recharge. Yearly hydrographs show water level fluctuations which correspond to surface water events. No long-term statewide decline of water levels can be demonstrated.

(A) Problems and Progress

Due to the lack of available data Vermont has been unable to characterize the quality of its ground water. In June 1979 a pilot study was initiated to collect existing ground water data in Chittenden County. This project will use an automated data processing system (ADPS) to produce a basic data report and a manual for public participation in ground water management. Completion for this study is scheduled for December 31, 1980. The principle value of this program for the State will be the creation and testing of the ADPS for use throughout the State's ground water programs.

Recent occurrences of poor quality ground water sometimes exceeding drinking water limits have heightened awareness of the potential for ground water pollution from various disposal practices. A more adequate monitoring system is needed in these areas with an emphasis on better regulated disposal practices. The development of a specific program to protect ground water resources is a big problem facing Vermont. Adequate controls need to be established to protect ground water for future use as a drinking water supply, and to protect existing supplies from potential pollution sources. Work is now in progress on such a program.

The state proposes to implement a coordinated comprehensive ground water protection and management program which will include problem assessment and development of best management programs prior to actual implementation. Included in this program will be monitoring, plan review, technical assistance and corrective measures. Fine tuning of the program will continue as analysis of results is permitted by the monitoring section.

(B) Need for Future Work

The Vermont Agency of Environmental Conservation proposes a number of programs designed to retain the integrity of the state's ground water.

By April 1, 1980, the Vermont Department of Water Resources will complete a first draft of a Vermont Ground Water Protection and Pollution Control Plan. This will result in a ground water protection regulation for promulgation by the Secretary of the Agency of Environmental Conservation and will establish an ongoing program to regulate and manage the state's ground water resource.

Vermont is due to complete a legislative package for ground water management. This may include a request for acceptance of primacy for underground injection control pursuant to the Safe Drinking Water Act.

The Ground Water Protection and Pollution Control Plan should be initiated by October 1, 1980 conditional upon legislative authority and adequate funding.

In January 1980 a statewide Ground Water Quality Monitoring Program was initiated. This program involves the formation of a network of 100-200 high capacity municipal ground water supplies to be monitored for biological, inorganic and organic constituents in order to establish baseline data for ground water quality. Analysis of this information should enable the Department of Water Resources to distinguish between natural levels of specific constituents and man's influence on the quality of ground water and to identify areas where the resource has been degraded.

Several programs have been involved with locating and inventorying potential ground water contamination sites, drilled water wells and other geohydrologic data. These programs are summarized as follows.

The Surface Impoundment Assessment (SIA) started during September 1978 has involved locating all agricultural, industrial and municipal impoundments throughout Vermont and assessing their impact upon ground water. A statewide aquifer map has been produced in addition to a final report. All work on this project will be completed by March 1980.

The United States Geological Survey in cooperation with the Vermont Department of Water Resources will produce a Statewide Ground Water Quality Inventory and Report. This study involves the collection of existing water quality data from private and public supplies to generally ascertain the quality of Vermont's ground water. Insufficient data allow only generalized conclusions to be made about the state's ground water quality. A report will be published when state funds become available.

The USGS in cooperation with the Vermont Department of Water Resources will produce an inventory of well locations, water quality data and hydrologic data in the Rutland, Vermont area. This report, which may be used to estimate ground water favorability and protect the existing resources, will be latest in a series of studies which began during the late 1960's.

A Well Drillers Licensing and Well Report Program, as established by Title 10 of Vermont Statutes, regulates well drilling and reporting practices. These reports have provided a large accumulation of ground water data. More effective management of this program would enhance the collection of this data.

XIII. ASSESSMENT OF THE STATE'S WATER QUALITY

The level of coliform bacteriological organisms in flowing waters continues to occasionally present itself as a basic water quality problem in Vermont. Data collected from waterways receiving virually no point source discharges continue to show levels of coliform organisms in excess of the criteria established in the water quality standards. Nonpoint runoff originating from agricultural, forested and urban areas (stormwater and combined sewer overflows) are believed to be essentially responsible for these elevated bacteriological levels. Being economically nonpoint in nature, these sources are not currently economically controllable. The sanitary significance of these elevated levels is not known at this time.

Appendix J and Table VII have been prepared as a summary of the State's current water uses relative to the 1983 goals. Appendix J represents an assessment of the State's segmented river miles. The water quality problems indicated in Appendix J for each of the designated river segments are in some instances based upon historical water quality data. Some segments indicating elevated coliform levels as a water quality problem are listed because of temporary violations of the technical standards for swimmable waters as a result of nonpoint source runoff and point source runoff resulting from urban stormwater or combined sewer overflows.

Table VII is presented as a summary of the State's water quality inventory including nonsegmented river miles which are those river miles upstream of the upper most discharges in a designated basin. It has been assumed for the purposes of this report that all nonsegmented river miles are currently meeting water quality standards since these waters are not receiving any pollution discharges and nonpoint problems are minor.

On the basis of the information reported in Table VII, Vermont has approximately 4850 miles of streams and river. Twenty-three percent (1116 river miles) of the nearly 4850 miles are segmented river miles. Segmented miles are defined as those river miles affected by municipal/industrial discharges. Only 3.7 percent of Vermont's total stream and river miles currently are not in accord with Class B standards. This represents approximately a thirty-four percent improvement over the reported 1977 conditions. Nearly eighty-eight stream and river miles were brought into compliance with Class B standards during the past two years. Essentially, 100% of the total river miles meet the fishable goal of the Act.

A true water quality assessment of all stream and river miles cannot be accomplished annually or even once every five years in Vermont. Best professional judgement currently serves as the basis for the majority of the information presented in Appendix J. The information presented is speculative at best and must be used with care. Vermont will continue to survey its rivers and streams but only at a rate which is within its personnel and budget capabilities.

TABLE VII
WATER QUALITY INVENTORY SUMMARY

BASIN NUMBER/ BASIN NAME	TOTAL MILES	TOTAL NON-SEGMENTED RIVER MILES	1977 SEGMENTED STREAM MILES TOTAL	1977 SEGMENTED STREAM MILES VIOLATED** W.Q.S.	1980 SEGMENTED STREAM MILES TOTAL	1980 SEGMENTED STREAM MILES VIOLATED W.Q.S.
#1 Batten Kill Walloomsac Hoosic	223	179.5	43.5	15.0	43.5	15.0
#2 Poultney-Mettawee	176	132	44.0	2.5	44.0	2.5
#3 Otter Creek Little Otter Creek Lewis Creek	467	381.5	85.5	6.0	85.5	6.0
#4&5 Lake Champlain	116	93	23.0	2.0	23.0	4.0
#6 Missisquoi	245	152	93.0	17.0	93.0	11.0
#7 Lamoille	412	322	90.0	17.0	90.0	6.0
#8 Winooski	599	484	115.0	14.0	115.0	4.0
#9 White	452	383	69.0	10.0	69.0	6.0
#10 Ottauquechee Black	244	179	65.0	23.0	65.0	12.0
#11 West, Williams, Saxtons	351	265	*86.0	2.0	86.0	2.0

* This figure is a corrected figure from the 1977 report.
** Essentially 100% river miles meeting fishable goal.

INVENTORY SUMMARY (cont.)

BASIN NUMBER/ BASIN NAME	TOTAL MILES	TOTAL NON-SEGMENTED RIVER MILES	1977 SEGMENTED STREAM MILES TOTAL	1977 SEGMENTED STREAM MILES VIOLATED** W.Q.S.	1980 SEGMENTED STREAM MILES TOTAL	1980 SEGMENTED STREAM MILES VIOLATED W.Q.S.
#12 Deerfield	155	121	34.0	10.0	34.0	6.0
#13&16 Connecticut	679	441	238.0	66.0	238.0	64.0
#14 Stevens, Wells, Waits, Ompompanoosuc	271	255	16.0	11.0	16.0	9.0
#15 Passumpsic	315	268	47.0	22.0	47.0	14.0
#17 Lake Memphremagog Black, Barton Clyde	251	84	*67.0	50.0	67.0	18.5
TOTAL	*4856	3740	*1116	267.5	1116.0	180.0
% OF TOTAL MILES		77%	23%	6%	23%	3.7%

*This figure is a corrected figure from the 1977 report.
**Essentially 100% river miles meeting fishable goal.

APPENDIX A

RESIDUAL PROJECTS FROM FY 1979

APPENDIX A

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (H8)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (Z1)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (Y6-Y6)
10 / 48	*Village of Derby Line* *Derby Line,* *Vermont* *05830*	*0100669* / *0023-001*	*P00110-01*	*134-01*	*I*	*2/80*	*Interceptors, Replacements, Connection to Rock Island, Quebec*		*AY* *2*		*50,200*	*37,600*	I II IIIa IIIb IVa IVb V
15 / 43	*Village of Derby Line* *Derby Line,* *Vermont* *05830*	*0100669* / *0023-001*	*C500134-01*	*134-02*	*II*	*3/79*	*Interceptors Collectors Connection to Rock Island, Quebec*		*AY* *2*		*65,300*	*49,000*	I II IIIa IIIb IVa IVb V
20 / 40	*Town of Bennington* *205 South Street* *Bennington, Vermont* *05201*	*0100021* / *0008-001*	*C500114-01*	*114-02*	*II*	*10/79*	*Upgrade Primary Sewage Treatment Plant to Secondary Replacements*		*AY* *2*		*300,000*	*225,000*	I II IIIa IIIb IVa IVb V
30 / 40	*Town of Newport* *Newport Center,* *Vermont* *05857*	*0101036* / *0046-001*	*P001110-01*	*122-01*	*I*	*2/80*	*Interceptors, Collectors, Land Treatment*	*R*	*AY* *2*		*54,000*	*40,500*	I II IIIa IIIb IVa IVb V

APPENDIX A

RESIDUAL PROJECTS FROM FY 1979

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (118)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (117)	Eligible Cost by Needs (Y0-Y6)
35 / 40	*Town of Newport* *Newport Center,* *Vermont* *05857*	*0101036* / *0046-001*	*C500122-01*	*122-02*	*II/ III*	*5/79*	*Interceptors, Collectors, Land Treatment*	*R*	*AY* *2*	*600,000*	*1,280,000*	*960,000*	I II IIIa IIIb *700,000 IVa IVb V
40 / 40	*Town of Glover* *Glover,* *Vermont* *05839*	*0100773* / *0100-001*	*P001110-01*	*130-01*	*I*	*2/80*	*Interceptors, Collectors, Municipal Leach Fields - Septic Tanks*	*R*	*AY* *2*		*32,000*	*24,000*	I II IIIa IIIb IVa IVb V
45 / 40	*Town of Glover* *Glover,* *Vermont* *05839*	*0100773* / *0100-001*	*C500130-01*	*130-02*	*II*	*5/79*	*Interceptors, Collectors*	*R*	*AY* *2*	*30,000*	*75,000*	*56,000*	I II IIIa IIIb IVa IVb V
50 / 35	*Town of Rochester* *Rochester,* *Vermont* *05676*	*0100013* / *0097-001*	*C500084*	*84-02*	*II/ III*	*10/79*	*Replacement/ Rehabilitation of Municipal Septic Leach Field*	*R*	*AY* *2*	*589,000*	*652,000*	*489,000*	I *589,000* II IIIa IIIb * 63,000 IVa IVb V

These costs do not reflect the total needs of the municipality. A portion of the established needs will be satisfied by this project with the remainder satisfied by future projects.

RESIDUAL PROJECTS FROM FY 1979

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (H8)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (Y0-Y6)
60 / 35	*Town of Ryegate (South Ryegate) South Ryegate, Vermont 05069*	*0100951 / 0023-001*	*P99kkk909k*	*156-01*	*I*	*2/80*	*Interceptors Collectors, Municipal Septic Tank - Leach Field*	*R*	*AY 2*		*22,000*	*16,500*	I II IIIa IIIb IVa IVb V
65 / 35	*Town of Ryegate (South Ryegate) South Ryegate, Vermont 05069*	*0100951 / 0100-001*	*C500156-01*	*156-02*	*II*	*6/79*	*Interceptors, Collectors Municipal Septic Tank - Leach Field*	*R*	*AY 2*	*34,000*	*85,000*	*63,500*	I II IIIa IIIb IVa IVb V
70 / 35	*Town of Pawlet Pawlet, Vermont 05761*	*0100811 / 0051-001*	*P001110-01*	*152-01*	*I*	*2/80*	*Interceptor, Collectors, Municipal Septic Tank - Leach Field*	*R*	*AY 2*		*70,000*	*52,500*	I II IIIa IIIb IVa IVb V
75 / 35	*Town of Pawlet Pawlet, Vermont 05761*	*0100811 / 0051-001*	*C500152-01*	*152-02*	*II*	*6/80*	*Interceptors, Collectors Secondary Treatment*		*AY 2*		*60,000*	*45,000*	I II IIIa IIIb IVa IVb V

RESIDUAL PROJECTS FROM FY 1979

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (118)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (Z1)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (Y0-Y6)
90 / 30	*Town of Whitingham* *Whitingham,* *Vermont* *05631*	*0101044* / *0084-001*	*C500116-01*	*116-02*	*II*	*8/79*	*Collectors, Interceptors, Package Sewage Treatment Plant in Jacksonville Village and Whitingham Village*		*AY* / *2*		*60,000*	*45,000*	I II IIIa IIIb IVa IVb V
100 / 30	*Town of Troy* *Box 30* *North Troy, Vermont* *05859*	*0100391* / *0077-001*	*P001110-01*	*160-01*	*I*	*2/80*	*Secondary Aerated Lagoon, Collectors and Interceptors*		*AY* / *2*		*70,000*	*52,500*	I II IIIa IIIb IVa IVb V
105 / 30	*Town of Troy* *Box 30* *North Troy, Vermont* *05859*	*0100391* / *0077-001*	*C500160-01*	*160-02*	*II*	*7/80*	*Interceptors, Collectors, Secondary Treatment*		*AY* / *2*		*68,500*	*52,000*	I II IIIa IIIb IVa IVb V
106 / 30	*Town of Wilmington* *P. O. Box 127* *Wilmington, Vermont* *05363*	*0100706* / *0087-001*	*C500129-01*	*129-02*	*II*	*4/80*	*Upgrade Primary to Secondary, Replacements, Extensions*		*AY* / *2*		*60,000*	*45,000*	I II IIIa IIIb IVa IVb V

RESIDUAL PROJECTS FROM FY 1979

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (H8)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (Z1)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (YO-Y6)
107 / 30	Town of Wilmington P. O. Box 127 Wilmington, Vermont 05363	0100706 / 0087-001	C500129-01	129-03	III	10/80	Extensions, (Segmented Step III)		AY 2		270,000	202,000	I II IIIa IIIb*270,000 IVa IVb V
110 / 25	Town of Danville Danville, Vermont 05828	0100633 / 0021-001	P001110-01	125-01	II	9/79	Evaluate Pollution Abatement Alternatives for Danville Village		AY 2		127,000	95,000	I II IIIa IIIb IVa IVb V
120 / 18	Town of Rutland Rutland, Vermont 05736	0100315 / 0091-001	P011110-01	136-01	I	8/79	Evaluation of Pollution Abatement Alternatives for Rutland Town		AY 2		90,000	67,500	I II IIIa IIIb IVa IVb V
130 / 15	Town of Woodstock Woodstock, Vermont 05091	0100757 / 0090-001	C500180-01	180-04	III	8/79	Sewage Treatment Plant Upgrade	R	AY 2	/ 100,000	1,200,000	900,000	I II IIIa IIIb IVa IVb V

* These costs do not reflect the total needs of the municipality. A portion of the established needs will be satisfied by this project with the remainder satisfied by future projects.

RESIDUAL PROJECTS FROM FY 1979

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (H8)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (YO-Y6)
170 / 13	*Town of Westminster (Westminster West) Westminster, Vermont 05158*	*N/A* / *0082-001*	*P001110-01*	*185-01*	*I*	*2/80*	*Collectors, Interceptors, Municipal Septic Tank - Leach Fields*	*R*	*BY* *2*		*13,000*	*9,750*	I II IIIa IIIb IVa IVb V
175 / 30	*Town of Westminster (Westminster West) Westminster, Vermont 05158*	*N/A* / *0082-001*	*C500185-01*	*185-02*	*II*	*6/80*	*Interceptors, Collectors, Municipal Septic Tank - Leach Fields*		*BY* *2*	*38,000*	*95,000*	*71,000*	I II IIIa IIIb IVa IVb V
													I II IIIa IIIb IVa IVb V
													I II IIIa IIIb IVa IVb V

RESIDUAL PROJECTS FROM BY 1979

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (H8)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac. #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (YC-Y5)
210 / 5	*Fairfield F. D. #1 Fairfield Vermont 05455*	*0101092 / 0028-001*	*P001110-01*	*112-01*	*I*	*9/79*	*Collectors Interceptors, Secondary Aerated Lagoon*		*AY 2*		*50,000*	*37,500*	I II IIIa IIIb IVa IVb V
220 / 5	*Town of Fair Haven Fair Haven, Vermont 05743*	*0101081 / 0029-001*	*C500188-01*	*188-02*	*II*	*8/79*	*Sewer Rehabilitation and Reconstruction*		*AY 2*		*67,000*	*50,000*	I II IIIa IIIb IVa IVb V
230 / 3	*City of St. Albans P. O. Box 429 St. Albans, Vermont 05478*	*0100321 / 0063-001*	*C500196-01*	*196-02*	*III*	*8/79*	*Interceptor Replacement*		*AY 2*		*1,500,000*	*1,125,000*	I II IIIa IIIb * *1,500,000* IVa IVb V
													I II IIIa IIIb IVa IVb V

FISCAL YEAR 1980

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (H8)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (YC-Y5)
240 / 40	Town of Glover Glover Vermont 05839	0100773 / 0100-001	P001110-01	130-01	III	5/80	Interceptors, Collectors, Pump Station & Force Main to Boston		AY 2**		1,330,600	908,000	I II IIIa IIIb * 1,330,600 IVa IVb V
250 / 40	Town of Pawlet Pawlet, Vermont 05761	0100811 / 0051-001	C500152-01	152-02	III	4/80	Secondary Sewage Treatment Plant, Interceptors for West Pawlet Village	R	AY 2	222,000	1,400,000	1,050,000	I 800,000 II IIIa IIIb 600,000 IVa IVb V
260 / 35	Town of Ryegate (South Ryegate) South Reygate, VT 05069	0100951 / 0062-002	C500156-01	156-02	III	4/80	Interceptors, Collectors, Septic Tank Leach Field	R	AY 2	100,000	254,000	190,000	I 100,000 II IIIa IIIb * 154,000 IVa IVb V
270 / 30	Town of Troy Box 30 Troy, Vermont 05865	0100391 / 0077-001	C500160-01	160-02	III	7/80	Secondary Aerated Lagoons, Collectors, Interceptors		AY 2		1,400,000	1,050,000	I 700,000 II IIIa IIIb* 700,000 IVa IVb V

* These costs do not reflect the total needs of the municipality. A Portion of the established needs will be satisfied by this project with the remainder satisfied by future projects.

** Numeric code indicating status of State Water Quality Management Plan.

FISCAL YEAR 1980

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (H8)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (Y6-Y5)
280 / 25	Town of Danville Danville Vermont 05828	0100633 / 0021-001	C500125-01	125-02	III	6/80	Interceptors, Collectors, Secondary Aerated Lagoons		AY 2		1,200,000	900,000	I 600,000 II IIIa IIIb* 600,000 IVa IVb V
290 / 23	Village of Derby Center Derby, Vermont 05829	0100986 / 0022-001	C500120-01	120-02	III	12/79	Construction of Collectors Interceptors, Pump Stations and Force Mains, Connection to Newport		AY 2		2,000,000	1,500,000	I II IIIa IIIb 2,000,000 IVa IVb V
300 / 23	Village of Wells River Wells River Vermont 05081	0100421 / 0081-001	C500098-01	98-02	III	6/80	Connectors, Interceptors, Replacements, Connection to Woodsville, N.H.		AY 2		2,000,000	1,500,000	I II IIIa IIIb 2,000,000 IVa IVb V
310 / 18	Westminster F. D. #1 Village of Westminster W RFD #3 Putney, Vermont 05346	N/A / 0082-001	C500185-01	185-02	III	4/80	Interceptors, Collectors, Septic Tank Leach Field	R	BY 2	100,000	267,000	200,000	I 100,000 II IIIa* 167,000 IIIb IVa IVb V

* These costs do not reflect the total needs of the municipality. A Portion of the established needs will be satisfied by this project with the remainder satisfied by future projects.

FISCAL YEAR 1980

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (68)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (82)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (YC-Y5)
320 / 18	City of Newport Main Street Newport, Vermont 05855	0100200 / 0045-001	C500132-02	132-03	III	12/79	Upgrade Primary to Secondary with Phosphorous Removal		AY 2	/ 800,000	4,500,000	3,375,000	I 4,500,000 II IIIa IIIb IVa IVb V
330 / 28	Town of Berlin RFD Montpelier, Vermont 05602	0100030 / 0010-001	C500147-01	147-02	II/III	9/80	Pump Station, Sewer Replacement. Force Main & Inter-Ceptor Sewers to Montpelier STP		AY 2	/	1,147,000	860,000	I II IIIa 1,147,000 IIIb IVa IVb V
340 / 28	City of Montpelier City Hall Montpelier Vermont 05602	0100196 / 0043-001	C500139-01	139-03	II/III	9/80	Design of Interceptors in Montpelier for Berlin-Montpelier Regionalization		AY 2	/	586,000	440,000	I II IIIa 586,000 IIIb IVa IVb V
350 / 15	Village of Swanton Box 6 Swanton, Vermont 05488	0100501 / 0075-001	C500186-01	186-02	II	12/79	Upgrade Secondary to Phosphorous Removal		AY 2	/	80,000	60,000	I II IIIa IIIb IVa IVb V

FISCAL YEAR 1980

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (H8)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (Y6-Y6)
360 / 15	*City of So. Burlington (Airport Parkway) 1175 Williston Road South Burlington, Vermont 05401*	*0100366* / *0070-002*	*C500143-01*	*143-02*	*II*	*1/80*	*Upgrade Primary to Secondary with Phosphorous Removal*		*AY* / *2*	/ *25,000*	*234,000*	*175,500*	I II IIIa IIIb IVa IVb V
370 / 15	*Shelburne F. D. #1 Shelburne Vermont 05482*	*0100331* / *0067-001*	*C500172-01*	*172-02*	*II/III*	*7/80*	*Upgrade Secondary to Phosphorous Removal*		*AY* / *2*	/	*538,000*	*403,900*	I *538,000* II IIIa IIIb IVa IVb V
380 / 15	*Shelburne F. D. #2 Shelburne Vermont 05482*	*0100331* / *0068-001*	*C500173-01*	*173-02*	*II/III*	*7/80*	*Upgrade Secondary to Phosphorous Removal*		*AY* / *2*	/	*544,000*	*408,000*	I *544,000* II IIIa IIIb IVa IVb V
390 / 15	*City of So. Burlington (Bartletts Bay) 1175 Williston Road South Burlington, Vermon 05401*	*0100367* / *0070-002*	*C500174-01*	*174-02*	*II/III*	*7/80*	*Upgrade Secondary to Phosphorous Removal*		*AY* / *2*	/	*535,000*	*401,250*	I *535,000* II IIIa IIIb IVa IVb V

FISCAL YEAR 1980

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (88)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (117)	Eligible Cost by Needs (Yr-Yr)
400 / 15	City of Burlington City Hall Burlington, Vermont 05401	0100226 / 0016-002	C500170-01	170-02	II	8/80	Upgrade Secondary to Phosphorous Removal		AY 2	/ 25,000	135,500	100,125	I II IIIa IIIb IVa IVb V
410 / 15	City of Winooski Winooski, Vermont 05404	0100510 / 0089-001	C500175-01	175-02	II/III	7/80	Upgrade Secondary to Phosphorous Removal		AY 2	/ 100,000	640,000	480,000	I 640,000 II IIIa IIIb IVa IVb V
420 / 5	Town of Fair Haven Fair Haven Vermont 05743	0101081 / 0029-001	C500188-01	188-03	III	4/80	Replacement and Rehabilitation		AY 2	/	332,000	250,000	I II IIIa 332,000 IIIb IVa IVb V
/		/								/			I II IIIa IIIb IVa IVb V

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (118)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (YO-Y6)
							Residual FY 79 Project Total					*4,810,850*	I
							Unobligated I/I Set-aside (FY 79)					*184,000*	II
							Reserve for Grant Increases (FY 79)					50,000	IIIa
							Maine Training Grant					*80,000*	IIIb
							Pending Incr/Decr					*700,000*	IVa
							Fiscal Year 1980 Project Total					14,251,775	IVb
							Unobligated I/I and small comm. set-aside (FY 80)					*465,200*	V
							205(g) Construction Grant Management					*400,000*	I
							Reserve for Grant Increases (FY 80)					*2,200,000*	II
							Fiscal Year 1980 List Total					24,341,825	IIIa
				Available			*Expected Obligations*				*Expected Unobligated Balance*		IIIb
													IVa
													IVb
													V
	Residual FY 79 Funds (July 1, 1979)			*8,400,000*			*8,216,000*				*184,000*		I
	Anticipated Fiscal Year 1980 Appropriations			*14,611,000*			*14,145,800*				*465,200*		II
	Total Funds Available (July 1, 1979)			*23,011,000*									IIIa
													IIIb
	Less:												IVa
	Small Community set-aside (FY 79			*828,300*			*828,300*						IVb
	~~*Innovative/Alternative set-aside (FY 79)*~~			~~*414,200*~~			~~*230,000*~~				~~*184,000*~~		V
	Reserve for Grant Increases (FY 79			50,000			50,000						I
	205(g) Construction Grant Management (FY 80)			*400,000*			*400,000*						II
	Small Community set-aside (FY 80)			*584,400*			*316,400*				*268,000*		IIIa
	Innovative/Alternative set-aside (FY 80)			*292,200*			*95,000*				*197,200*		IIIb
	Reserve for Grant Increases (FY 80)			*2,200,000*			*2,200,000*						IVa
	Funds Available for Construction Grants			*17,041,900*									IVb
													V

FISCAL YEAR 1981

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (N8)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (Y0-Y6)
430 / 35	City of St. Albans P. O. Box 429 St. Albans, Vermont 05478	0100323 / 0063-001	C500133-01	133-02	II	10/80	Upgrade to Tertiary, Replacements		AY 2	/ 30,000	400,000	300,000	I II IIIa IIIb IVa IVb V
440 / 18	Village of Essex Jct. Essex Junction Vermont 05452	0100111 / 0025-001	C500135-02	135-03	III	10/80	Upgrade Primary to Secondary with Phosphorous Removal		AY 2	/ 800,000	5,434,666	4,076,000	I II IIIa IIIb IVa IVb V
450 / 15	City of Burlington (Airport Parkway) 1175 Williston Road South Burlington, Vermont 05401	0100366 / 0070-002	C500143-02	143-03	III	10/80	Upgrade Primary to Secondary with Phosphorous Removal		AY 2	/	5,800,000	4,345,400	I II IIIa IIIb IVa IVb V
460 / 15	City of Burlington City Hall Burlington, Vermont 05401	0100226 / 0016-002	C500170-02	170-03	III	3/81	Upgrade Secondary Sewage Plant to Phosphorous Removal		AY 2	/ 800,000	1,081,333	1,341,000	I II IIIa IIIb IVa IVb V

FISCAL YEAR 1981

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (H8)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (Y0-Y6)
470 / 15	Village of Swanton Box 6 Swanton, Vermont 05488	0100501 / 0075-001	C500186-02	186-03	III	1/81	Upgrade Sewage Treatment Plant to Phosphorus Removal Replacements		AY 2		2,066,000	1,550,025	I II IIIa IIIb IVa IVb V
490 / 15	Village of Enosburg Falls Enosburg Falls, Vermont 05450	0100102 / 0024-001	C500089-01	89-02	III	10/80	Replacements		AY 2		800,000	600,000	I II IIIa IIIb IVa IVb V
490 / 15	Colchester F. D. #1 c/o St. Michael's Coll. Box 103 56 College Street Winooski, Vermont 05404	0100960 / 0020-001	C500171-01	171-02	II/ III	11/79	Upgrade Secondary to Phosphorous Removal		AY 2		667,000	500,000	I II IIIa IIIb IVa IVb V
													I II IIIa IIIb IVa IVb V

FISCAL YEAR 1981

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (H0)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (Y0-Y6)
							Fiscal Year 1981 Project Total *205(g) Construction Grant Management* *Unobligated I/A and small comm. set-asides* *Reserve for Grant Increases* *Fiscal Year 1981 List Total*					*12,712,425* *400,000* *940,000* *1,890,000* *15,942,425*	I II IIIa IIIb IVa IVb V
		Anticipated Appropriations					*Available Fiscal Year 1981 Funds* *15,764,000*				*Expected Obligations* *19,734,400*	*Expected Unobligated Balance* *940,000*	I II IIIa IIIb IVa IVb V
		205(g) Construction Grant Management *Small Community set-aside (4%)* *Innovative/Alternative set-aside (3%)* *Reserve for Grant Increase (12%)* *Funds Available for Construction Grants*					*400,000* *630,600* *473,000* *1,890,000* *12,370,000*				*- 0 -* *163,000*	*630,600* *310,000*	I II IIIa IIIb IVa IVb V
													I II IIIa IIIb IVa IVb V

FISCAL YEAR 1982

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (H8)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (Y0-Y6)
500 / 48	Village of Derby Line Derby Line, Vermont 05830	0100668 / 0023-001	C500134-02	134-03	III	10/81	Construction of Interceptors, Replacements, Connection to Rock Island, Quebec		AY 2		827,750	620,813	I II IIIa IIIb IVa IVb V
510 / 35	City of St. Albans P. O. Box 429 St. Albans, Vermont 05479	0100323 / 0063-001	C500133-02	133-03	III	4/82	Upgrade Primary Sewage Treatment Plant to Secondary with Phosphorus Removal		AY 2		7,200,000	5,400,000	I II IIIa IIIb IVa IVb V
520 / 30	Town of Whitingham Whitingham, Vermont 05301	0101044 / 0084-001	C500116-02	116-03	III	10/81	Collectors, Interceptors, Package Sewage Treatment Plant in Jacksonville and Whitingham Vill.		AY 2		1,200,000	900,000	I II IIIa IIIb IVa IVb V
530 / 25	Town of Barre Websterville Vermont 05678	0100099 / 0005-001	C500141-01	141-02	II	10/81	Upgrade Primary to Secondary Collectors, Replacements		AY 2		171,200	128,400	I II IIIa IIIb IVa IVb V

FISCAL YEAR 1982

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (83)	Applicant's Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (Y0-Y6)
540 / 25	*Town of Arlington* *Arlington* *Vermont* *05250*	*0100587* / *0003-001*	*C500092-01*	*92-02*	*II*	*10/81*	*Interceptors, Collectors, Secondary Sewage Treatment Plant*		*AY* 2		*170,500*	*127,875*	I II IIIa IIIb IVa IVb V
550 / 18	*Town of Essex* *Essex* *Vermont* *05451*	*0100994* / *0026-001*	*C500113-01*	*113-02*	*III*	*10/81*	*Interceptors, Collectors, Connection to Essex Junction*		*AY* 2		*3,333,300*	*2,500,000*	I II IIIa IIIb IVa IVb V
560 / 16	*Town of Williston* *Box 137* *Williston, Vermont* *05495*	*0100439* / *0096-001*	*C500121-01*	*121-02*	*III*	*10/81*	*Interceptors, Collectors, Connection to Essex Junction*		*AY* 2		*4,000,000*	*3,000,000*	I II IIIa IIIb IVa IVb V
													I II IIIa IIIb IVa IVb V

FISCAL YEAR 1982

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (H8)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac # (32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (37)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (YO-Y6)
							Fiscal Year 1982 Project Total					*12,677,088*	I
							205(g) Construction Grant Management					*400,000*	II
							Unobligated small community set-aside					*630,600*	IIIa
							Reserve for Grant Increases (17%)					*2,700,000*	IIIb
													IVa
							Fiscal Year 1982 List Total					*16,407,688*	IVb
													V
													I
							Available Fiscal Year 1982 Funds				*Expected Obligations*	*Expected Unobligated Balance*	II
													IIIa
													IIIb
													IVa
													IVb
													V
		Anticipated Appropriations					*15,764,000*				*15,133,400*	*630,600*	I
		205(g) Construction Grant Management					*400,000*						II
		Small Community set-aside (4%)					*630,600*				*- 0 -*	*630,600*	IIIa
		Reserve for Grant Increase (17%)					*2,700,000*						IIIb
													IVa
		Funds Available for Construction Grants					*12,033,400*						IVb
													V
													I
													II
													IIIa
													IIIb
													IVa
													IVb
													V

FISCAL YEAR 1983

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (H8)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (YO-Y6)
570 / 40	Town of Bennington 205 South Street Bennington, Vermont 05201	0100021 / 0008-001	C500114-02	114-03	III	10/82	Upgrade Primary Sewage Treatment Plant to Secondary Replacements		AY 2		6,000,000	4,500,000	I II IIIa IIIb IVa IVb V
580 / 28	Town of Sherburne Killington, Vermont 05751	N/A / 0069-001	C500094-02	94-03	III	10/82	Collectors, Interceptors, Secondary Sewage Treatment Plant		BY 2		5,009,853	3,753,600	I II IIIa IIIb IVa IVb V
590 / 25	Town of Barre Websterville, Vermont 05678	0100099 / 0005-001	C500141-02	141-03	III	10/82	Upgrade Primary Sewage Treatment Plant to Secondary Replacements		AY 2		3,148,000	2,361,000	I II IIIa IIIb IVa IVb V
600 / 18	City of Rutland Rutland, Vermont 05701	0100871 / 0061-001	C500137-01	137-02	II	10/82	Upgrade Primary Sewage Treatment to Secondary with Filters, Replacements		AY 2		280,000	210,000	I II IIIa IIIb IVa IVb V

FISCAL YEAR 1983

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (48)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (YO-Y6)
610 / 18	Town of Rutland Rutland, Vermont 05736	0100315 / 0091-001	C500136-01	136-02	II	10/82	Design Pollution Abatement Facilties for Rutland Town		AY 2		280,000	210,000	I II IIIa IIIb IVa IVb V
620 / 15	Village of St. Johnsbury St. Johnsbury, Vermont 05819	0100579 / 0091-001	C500128-01	128-02	II	10/82	Upgrade Primary Sewage Treatment Plant to Secondary		AY 2		400,000	300,000	I II IIIa IIIb IVa IVb V
													I II IIIa IIIb IVa IVb V
													I II IIIa IIIb IVa IVb V

FISCAL YEAR 1983

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (H8)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (37)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (Y0-Y6)
							Fiscal Year 1983 Project Total					*11,334,600*	I
							205(g) Construction Grant Management					*400,000*	II
							Unobligated small community set-aside					*630,600*	IIIa
							Reserve for Grant Increases (22%)					*3,468,000*	IIIb
							Fiscal Year 1983 Total						IVa
												15,833,200	IVb
													V
													I
							Available Fiscal Year 1983 Funds				*Expected Obligations*	*Expected Unobligated Balance*	II
													IIIa
													IIIb
													IVa
													IVb
													V
		Anticipated Appropriations					*15,764,000*				*15,133,400*	*630,600*	I
		205(g) Construction Grant Management					*400,000*						II
		Small Community Set-aside (4%)					*630,600*				*- 0 -*	*630,600*	IIIa
		Reserve for Grant Increase (22%)					*3,468,000*						IIIb
													IVa
		Funds Available for Construction Grants					*11,265,400*						IVb
													V
													I
													II
													IIIa
													IIIb
													IVa
													IVb
													V

FISCAL YEAR 1984

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (H8)	Applicant Legal Name, Street Address, City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (Z1)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (YO-Y6)
630 / 25	Town of Arlington Arlington Vermont 05250	0100587 / 0003-001	C500092-01	92-03	III	10/83	Abatement of Pollution in Arlington Village	R	AY 2	/ 100,000	667,000	500,000	I II IIIa IIIb IVa IVb V
													I II IIIa IIIb IVa IVb V
													I II IIIa IIIb IVa IVb V
660 / 17	City of Rutland Rutland Vermont 05701	0100871 / 0061-001	C500137-01	137-03	III	4/84	Upgrade Primary to Advanced Secondary Replacements		AY 2		8,670,000	6,500,000	I II IIIa IIIb IVa IVb V

FISCAL YEAR 1984

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (H3)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (YO-Y6)
670 / 13	*Town of Williston (Oak Hill) Box 137 Williston, Vermont 05495*	*0100439 / 0086-001*	*C500191-01*	*191-02*	*II*	*10/83*	*Collectors, Interceptors*		*AY 2*		*120,000*	*90,000*	I II IIIa IIIb IVa IVb V
680 / 10	*Town of Bethel RD Bethel, Vermont 05032*	*0100045 / 0011-001*	*C500124-02*	*124-03*	*III*	*10/83*	*Secondary Aerated Lagoons, Collectors, Interceptors*		*AY 2*		*2,469,333*	*1,852,000*	I II IIIa IIIb IVa IVb V
690 / 8	*Village of Bellows Falls Bellows Falls, Vermont 05101*	*0100013 / 0007-001*	*C500149-01*	*149-02*	*II*	*10/83*	*Upgrade Primary Sewage Treatment Plant to Secondary*		*AY 2*		*236,000*	*177,000*	I II IIIa IIIb IVa IVb V
/		/								/			I II IIIa IIIb IVa IVb V

FISCAL YEAR 1984

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (CH8)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (B2)	Project Number (01, 03 54)	Proj Step (87)	Grant Cert. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (YO-Y6)
710 / 5	Town of Windsor Windsor, Vermont 05089	0100919 / 0088-011	C500148-01	148-02	II	10/83	Upgrade Primary to Secondary		AY 2		130,000	97,500	I II IIIa IIIb IVa IVb V
720 / 5	Town of Proctor Proctor, Vermont 05765	0100528 / 0055-001	C500145-01	145-02	II	10/83	Upgrade Primary to Seconday Replacements		AY 2		180,500	135,400	I II IIIa IIIb IVa IVb V
710 / 3	Town of St. George RD Williston, Vermont 05495	N/A / 0104-001	C500154-01	154-02	II	10/83	Design Pollution Abatement Facilities for St. George	R	BY 2	40,000	80,000	60,000	I II IIIa IIIb IVa IVb V
													I II IIIa IIIb IVa IVb V

FISCAL YEAR 1984

CONSTRUCTION GRANTS STATE PROJECT PRIORITY LIST

Rank (59) / (H8)	Applicant Legal Name Street Address City, State Zip Code (12, 51, 14, 62)	NPDES Permit No. / Needs Fac #(32)	Grant Number Parent Project (E2)	Project Number (01, 03 54)	Proj Step (37)	Grant Germ. Target Date (A5)	Description of Project (20)	Alt. Syst. for Small Comm. (33)	Enf. Req. (21)	Innov. Elig Cost (Y7) / Alter Elig. Cost (Y8)	Total Eligible Cost (29)	Est. EPA Assistance (H7)	Eligible Cost by Needs (YO-Y6)
							Fiscal Year 1984 Project Total					1,411,900	I
							205(g) Construction Grant Management					400,000	II
							Unobligated small community set-aside					630,600	IIIa
							Reserve for Grant Increases					5,456,000	IIIb
													IVa
							Fiscal Year 1984 List Total					14,698,500	IVb
													V
													I
													II
													IIIa
							Available Fiscal Year 1984 Funds				Expected Obligations	Expected Unobligated Balance	IIIb
													IVa
													IVb
													V
		Anticipated Appropriations					15,674,000				15,113,400	630,600	I
		205(g) Construction Grant Management					400,000						II
		Small Community Set-Aside (4%)					630,600				- 0 -	630,600	IIIa
		Reserve for Grant Increases (34%)					5,456,000						IIIb
													IVa
		Funds Available for Construction Grants					10,477,600						IVb
													V
													I
													II
													IIIa
													IIIb
													IVa
													IVb
													V

APPENDIX B

STATE WATER QUALITY PLAN FOR THE MANAGEMENT OF ON-SITE WASTEWATER DISPOSAL

The effective management of on-site wastewater disposal in Vermont must be solidly grounded in satisfying demonstrated management needs in the public interest. These needs are clearly seen to be:

(1) to minimize public health hazards,
(2) to minimize surface and groundwater pollution, and
(3) to avoid unanticipated or unplanned sewer construction and centralized waste treatment and their associated local, state, and federal costs.

The goal of this plan therefore is to ensure that on-site sewage systems are properly sited, designed, constructed, installed, operated, and maintained; and that these systems provide an effective long-term means of providing for the adequate on-site treatment of wastewater. An additional goal of the plan is to allow individuals and municipalities maximum freedom and flexibility to solve their own waste disposal problems within the constraints of the management needs stated above.

The 208 on-site wastewater disposal plan contains recommendations of the project consultants as well as recommendations by individuals involved in the administration of state and local on-site waste disposal management programs. The recommendations outlined in the plan will lead to legislative, regulatory, and management solutions to improve on-site wastewater disposal management programs in Vermont. While the central responsibility for implementing the plan (and the rural wastewater program in general) should lie with the state, existing institutional arrangements on a state, regional, and local level should be utilized, coordinated, and strengthened so as to create an integrated on-site management program. The major organizations currently involved in the planning and management of on-site waste disposal are presented in Appendix I, along with their respective roles or responsibilities as outlined in the 208 On-Site Plan which follows.

208 ON-SITE WASTEWATER DISPOSAL PLAN ELEMENTS

1. Increase the Effectiveness of the On-Site Sewage Program

The Vermont Association of Conservation Districts (VACD) On-Site Sewage Program provides a valuable service to towns by assuring the proper site evaluation, system design, and installation supervision of individual sewage systems. The program should be expanded so as to make these technical services available to all interested towns at a reasonable cost. The following steps should be taken to increase the effectiveness of the on-site sewage program.

(a) The Vermont legislature should increase the present annual state subsidy of the program from $48,000 per year to a level which will allow the program to continue operation and to be effectively administered.

(b) Fees obtained for on-site specialist services should be changed regularly to reflect changes in the over-all economy of the state.

(c) The services already provided by the on-site specialist (i.e., site evaluation, system design, and installation supervision) should be expanded to include:

1. assistance to towns in the development and implementation of comprehensive on-site system maintenance programs which include the disposal of septage, and
2. providing education and information services to homeowners on the proper functioning, operation, and maintenance of their on-site systems.

(d) The on-site sewage program should continue to design individual sewage systems based on the state's minimum standards as currently specified in the Vermont Health Regulations (Chapter 5, Part II).

(e) On-site specialists should be required to obtain state certification for site evaluation and system design as described under Plan Element No. 5.

(f) A clear link of authority and responsibility (i.e., liability) for the on-site sewage program should be established under state statutes. The current statutes do not clarify the relationship among the Natural Resources Conservation Council, the Vermont Association of Conservation Districts, and the On-Site Sewage Program.

BUDGET — Funding level at the discretion of the General Assembly

FUNDING SOURCE — Vermont State General Assembly

RESPONSIBILITY — The 208 Board will endorse the on-site sewage program through the legislature (a). The on-site sewage program will be responsible for adjusting fees (b), expanding the scope of the services (c), and for designing systems using state minimum standards (d). The Protection Division shall be responsible for certifying on-site specialists (e).

2. Encourage Towns with Existing or Potential On-Site Wastewater Disposal Problems to take Responsibility for Adopting Appropriate Regulatory Controls

The Vermont Association of Conservation Districts On-Site Sewage Program should be funded to hire an individual to work with town officials to encourage and assist them in implementing appropriate programs for managing on-site waste disposal. This

individual would be funded for a two-year period. Job responsibilities would include the following.

(a) Identify those towns which lack adequate local mechanisms for regulating on-site waste disposal.

(b) Identify those towns with existing or potential water quality or health problems resulting from the lack of adequate regulatory controls. Soil and site limitations and rate of growth should be major criteria used to identify potential problem areas.

(c) Rank towns based on the need for adopting on-site regulatory controls.

(d) Organize meetings in priority towns with local officials (i.e., selectmen, health officers, zoning administrators) and residents to educate and inform them of the potential problems and alternative approaches to managing on-site waste disposal. The rural sewage treatment workbooks, developed by VNRC, should be utilized to meet this objective.

(e) Encourage and assist town officials in adopting necessary ordinances or controls for on-site waste disposal.

(f) Encourage towns to participate in the on-site sewage program.

(g) Develop education and maintenance programs in towns.

BUDGET	Salary ($15,000/year for two years)	$30,000
	Expenses (travel, food, lodging, etc.)	10,000
	Total	$40,000

FUNDING SOURCE 208 Program, AEC

RESPONSIBILITY VACD On-Site Sewage Program (with assistance from the Department of Health and Water Resource Investigators to identify towns under parts (a) and (b) of the recommendation).

3. Transfer On-Site Wastewater Disposal Rule-Making Authority to the Agency of Environmental Conservation

The Agency of Environmental Conservation should be designated as the single state agency with the authority to write and adopt rules and standards relating to the soil and site evaluation, design, construction, operation, and maintenance of on-site sewage systems, as well as rules relating to the proper administration and enforcement of local ordinances which regulate on-site systems. Rules and standards adopted by the AEC would replace the existing rules adopted by the Board of Health.

The rule-making transfer would result in a more responsive and efficient administration of the state's subdivision, public building, and campground programs. Moreover, the expertise relating to individual on-site systems lies within the Agency of Environmental Conservation rather than the Department of Health. The local administration of ordinances for individual sewage systems should remain unchanged as a result of the transfer and the health-officer program shall not be affected by the rule making transfer to the AEC.

Rules adopted by the AEC for individual sewage systems shall be required as minimum standards for those municipalities which adopt or amend ordinances regulating on-site systems.

BUDGET None required, work performed by AEC staff personnel.

RESPONSIBILITY Appropriate legislation has been drafted by the Assistant Secretary of the Agency of Environmental Conservation in conjunction with the Senate Committee of Energy and Natural Resources.

4. The Secretary of the Agency of Environmental Conservation should Establish an On-Site Wastewater Disposal Advisory Committee

This committee should consist of single representatives from the Agency of Environmental Conservation, the Environmental Board, the State Board of Health, the Department of Health, the University of Vermont, and shall include a town health officer, a town selectman, and a septic system installer, with these last three persons being chosen from communities of 3,000 or less population.

The committee should:

(a) advise the Secretary of the Agency of Environmental Conservation in establishing rules and standards on the on-site disposal of wastewater from subdivisions, campgrounds, trailer parks, public buildings, and individual sewage systems,

(b) evaluate research on on-site waste disposal regulatory standards (i.e., separation distances between leach fields and seasonal high water table) and make recommendations to the Secretary of the Agency of Environmental Conservation for the appropriate changes,

(c) advise the Secretary of the Agency of Environmental Conservation in the improved administration of the state's on-site regulatory programs,

(d) review and evaluate current research and technological advances relating to innovative sewage disposal systems and methods,

(e) evaluate in-state research and experimentation with alternative and innovative systems for use in areas with soil and/or site limitations, and

(f) recommend to the Secretary of the Agency of Environmental Conservation the acceptance of innovative on-site waste disposal systems which meet the state's performance standards (as stated in the Agency's regulations) when properly designed, installed, and maintained.

BUDGET Approximately $1,000 annually

FUNDING SOURCE Agency of Environmental Conservation

RESPONSIBILITY Secretary of Agency of Environmental Conservation. The five organizations shall appoint their representatives, and the Secretary of the Agency of Environmental Conservation shall appoint the other three members.

5. Require Certification of All Individuals Who Submit On-Site Wastewater Disposal Plans for State Approval

The quality of on-site wastewater disposal plans submitted to the Protection Division from professional engineers and site technicians is currently below acceptable standards. Ensuring higher quality work by consultants will increase efficiency in Protection Division programs by minimizing the need for detailed review and on-the-job consultant training and serve the consultants' clients as well.

This certification shall apply to any individual who submits on-site plans for

state review, including professional engineers, soil scientists, geologists, hydrologists, site technicians, and the on-site specialists from the Vermont Associations of Conservation District's program. The certification program should be administered by the Protection Division of the Agency of Environmental Conservation. The program should include the development of appropriate educational programs (i.e., certification workshops and in-the-field demonstrations) and the conducting of the certification test.

BUDGET $5,000 annually

FUNDING SOURCE Vermont General Assembly

RESPONSIBILITY (a) 208 Staff shall draft appropriate legislation and
(b) Protection Division shall implement the certification program

6. Hold Workshops for Installers of On-Site Systems in Order to Improve the Quality of Installations and Increase Their Useful Life Expectancy

Attendance at these workshops should be voluntary. The workshops should be organized as a cooperative effort among the 208 Program, VACD On-Site Sewage Program, the UVM Extension Service, and the Soil Conservation Service. The UVM Extension Service shall be designated as the lead organization.

The format of the workshops should follow the 208 Forestry Workshops. A morning session, held in-doors, would present information and techniques from a variety of expert participants. An afternoon, outdoor demonstration session would complement the morning's speakers.

Five workshops should be held during the Spring of 1981 and, depending on their success, the program should be continued in following years.

BUDGET $5,000 for five workshops

FUNDING SOURCE 208 Program for first year's workshops. After 1980 the funding source is questionable.

RESPONSIBILITY UVM Extension Service in cooperation with the Soil Conservation Service, the On-Site Sewage Program, and the 208 Program.

7. Offer a Voluntary Certification Program for Septic System Installers to be Administered by the Agency of Environmental Conservation, Protection Division

Installers should be encouraged but not required to become certified by the state if they can demonstrate a level of competence in performing site evaluations, design, and installation of on-site systems for individual homes. Installers would be encouraged to refer to the state certification in their promotional literature.

BUDGET $3,000 annually

FUNDING SOURCE Vermont General Assembly

RESPONSIBILITY Agency of Environmental Conservation, Protection Division

8. Increase the Permit Monitoring and Enforcement Capability of On-Site Wastewater Disposal Programs Administered by the Protection Division of the Agency of Environmental Conservation

Present permit programs are excessively weighted toward paper work and permit issuance with little or no follow-up to assure that the conditions of permits are met and that these conditions are effective.

The legislature should appropriate an additional $60,000 annually to supplement the budget of the Protection Division. This money should be used to hire three environmental technicians. The technicians, along with the two field technicians currently working with the Division, should be assigned to the five AEC District Offices (one technician per office). Responsibilities of the technicians shall include

(a) providing timely site inspections for permit reviews,
(b) providing follow-up inspection for all permits to ensure conditions are satisfactorily met, and
(c) initiating enforcement procedures where necessary.

BUDGET $60,000 annually

FUNDING SOURCE Vermont General Assembly

RESPONSIBILITY The 208 Board shall endorse this action through the legislature.

9. Conduct Research on Innovative On-Site Systems

The Protection Division of the Agency of Environmental Conservation shall supervise research and experimentation into the use of innovative on-site waste disposal systems for individual homes (i.e., those systems not currently approved by the Vermont Health Regulations, Chapter 5, Part II). Innovative systems should be evaluated, especially for those areas of Vermont where soil or site limitations prohibit the use of conventional on-site systems or methods. The actual research may be performed under contract(s) to independent consultants, the University of Vermont Water Resources Research Center, the VACD On-Site Sewage Program, or any other organization submitting a proposal consistent with the scope of work identified by the Protection Division in its role as research supervisor and coordinator. Results of any research would subsequently be forwarded to the sewage advisory committee (Plan Element No. 4) for its evaluation and recommendation to the Secretary of the Agency of Environmental Conservation

BUDGET $40,000

FUNDING SOURCE 208 Program

RESPONSIBILITY The Protection Division would be responsible for supervising the research.

10. Research on Adequacy of State's Groundwater Regulatory Standards Governing On-Site Waste Disposal

Standards contained in the State Health Regulations pertaining to the protection of groundwater from on-site waste disposal systems have not been scientifically evaluated for their effectiveness. These standards, including the depth of unsaturated soil between the bottom of the leachfield and the seasonal high water table or to bedrock,

should be carefully evaluated through a complete investigation of available research literature which documents the renovative capacity of various soil types similar to those typical of Vermont.

Based on this evaluation and possible field research for verification purposes, the state's groundwater standards should be revised, if appropriate, to ensure that groundwater resources and public health are protected from septic system leachate. The revised standards should not be overly conservative so as to restrict the use of conventional on-site systems in areas where acceptable wastewater renovation can be documented.

BUDGET $10,000

FUNDING SOURCE 208 Program

RESPONSIBILITY Literature review and possible follow-up field research shall be supervised by the Agency of Environmental Conservation's Protection Division with work performed under contract.

SUMMARY OF DRAFT 208 PLAN FOR IMPROVING
THE MANAGEMENT OF ON-SITE WASTE DISPOSAL IN VERMONT

	PLAN ELEMENT	BUDGET	FUNDING SOURCE	RESPONSIBILITY
1.	Increase the effectiveness of the On-Site Sewage Program	At discretion of General Assembly	Vermont General Assembly	-208 Board will endorse program through legislature -On-Site Sewage Program will implement recommendations -Protection Division shall certify on-site specialist
2.	Encourage towns with existing or potential on-site wastewater disposal problems to take responsibility for adopting appropriate regulatory controls	$40,000	208 Program	-Vermont Association of Conservation District On-Site Sewage Program
3.	Transfer on-site wastewater disposal rule-making authority to the Agency of Environmental Conservation	None		-Director of AEC Protection Division in conjunction with Senate Committee of Energy and Natural Resources
4.	The Secretary of the AEC should establish an on-site wastewater disposal advisory committee	$1,000 annually	AEC	-Secretary, AEC -Five organizations to appoint own representatives to committee
5.	Require certification of all individuals who submit on-site wastewater disposal plans for state approval	$5,000 annually	Vermont General Assembly	-Legislation drafted by 208 staff -Protection Div. shall implement the certification program
6.	Hold workshops for installers of on-site systems in order to improve the quality of installations and increase their useful life expectancy	$5,000 five workshops	208 Program (first year)	-UVM Extension Service in cooperation with the Soil Conservation Service, the On-Site Sewage Program, and the 208 Program
7.	Offer a voluntary certification program for septic system installers to be administered by the AEC, Protection Division	$3,000 annually	Vermont General Assembly	-AEC, Protection Division
8.	Increase permit monitoring and enforcement capability of on-site wastewater disposal programs administered by Protection Division	$60,000 annually	Vermont General Assembly	-208 Board shall endorse this action through the legislature
9.	Conduct research on innovative on-site systems	$40,000	208 Program	-Protection Division responsible for supervising research
10.	Research on adequacy of state's groundwater regulatory standards governing on-site waste disposal	$10,000	208 Program	-Protection Division, AEC

APPENDIX I

ROLES AND RESPONSIBILITIES FOR ORGANIZATIONS INVOLVED IN THE PLANNING AND MANAGEMENT OF ON-SITE WASTE DISPOSAL

NOTE: Those responsibilities delegated as a result of the 208 On-Site Plan are preceded by an asterix. In each case the specific plan element is referenced. The remaining roles and responsibilities listed below are presently being implemented under existing state, local, or private on-site waste disposal programs. These are included in order to present a complete picture of on-site management functions statewide.

STATE GOVERNMENT

Agency of Environmental Conservation

* - Write and adopt rules and regulatory standards for on-site waste disposal systems which include the state subdivision program, campgrounds, land application of effluent, and waste disposal systems for individual homes. (Plan Element #4, page 4).

- Administer the state's programs for subdivisions, and operation of campgrounds.

* - Certify persons to perform site evaluations and to design on-site systems which will subsequently be reviewed and permitted by the state as part of either the subdivision or campground regulations. (Plan Element #6, page 5).

- Provide technical assistance to local officials in the review of permits for individual on-site systems.

* - Supervise research on innovative on-site systems. (Plan Element #9, page 3).

* - Supervise research on groundwater regulatory standards. (Plan Element #10, page 6).

* - Establish a sewage advisory committee to make recommendations to the Secretary. (Plan Element #5, page 4).

Agency of Human Services

- Provide health officers, or other individuals involved in the administration of on-site ordinances, with information and assistance regarding the health aspects of on-site waste disposal. Encourage these local administrators to survey homes for health violations (i.e., effluent surfacing) and to enforce these violations to ensure the protection of public health.

* - Participate in AEC's sewage advisory committee. (Plan Element #5, page 4)

LOCAL GOVERNMENT

- Adopt ordinances regulating on-site waste disposal from single family residences.

- Designate permit granting authority (i.e., health officer, zoning administrator, or other individual with on-site technical background) for administering local ordinances.

- Designate permit reviewing personnel (if different from above) which might include on-site specialist (VACD) or consulting engineer. Enter into contract agreement with on-site program or consulting engineer.

- Seek technical assistance from AEC district offices when necessary.

- Enforce on-site ordinances and implement procedures for bringing any violation into conformance with the ordinance.

REGIONAL PLANNING COMMISSIONS

- Provide technical assistance to local planning officials primarily relating to zoning, comprehensive planning, and wastewater management planning issues.

- Assist towns in the preparation of health regulations.

NATURAL RESOURCES CONSERVATION DISTRICTS, ON-SITE SPECIALIST PROGRAM

- Contract with towns as consultant in the site evaluation and design of individual sewage systems.

* - Assist towns in developing and implementing maintenance programs. (Plan Element #1, page 2)

* - Provide information and educational services to homeowners on operation and maintenance procedures. (Plan Element #1, page 2)

* - Encourage towns to adopt local ordinances and provide assistance in doing so. (Plan Element #2, page 2)

* - Participate in AEC's Sewage Advisory Committee. (Plan Element #5, page 4)

VERMONT NATURAL RESOURCES COUNCIL

- Develop and implement educational programs (i.e., workshops, seminars) aimed at increasing the effectiveness of on-site waste disposal management.

- Provide information on on-site waste disposal technologies for interested persons and create a clearinghouse of such materials for general reference purposes.

- Seek grants to perform research on acceptable low cost alternative waste disposal systems.

UNIVERSITY OF VERMONT EXTENSION SERVICE

* - Develop and coordinate workshops for installers of on-site wastewater disposal systems to improve the quality of installations and increase their useful life expectancy (Plan Element #7, page 5)

APPENDIX II

(The following responsiveness summary addresses comments received at four public hearings held throughout the state during November 1979. Hearings were held in Montpelier, Bellows Falls, St. Albans, and Rutland with a total attendance of approximately 60 persons. As a direct result of comments received at these hearings, significant changes have been made to the original 208 draft on-site plan. The original draft plan is included as Appendix III.)

RESPONSIVENESS SUMMARY OF COMMENTS MADE AT ON-SITE PUBLIC HEARINGS HELD IN NOVEMBER 1979

Comment No. 1 - Plan should endorse the On-Site Program of the Conservation Districts and recommend its expansion to the whole state. Such a program should be technically sound and should be under the control of local units of government. The 208 Board should formally recognize and endorse the On-Site Program.

RESPONSE: The 208 staff completely agrees with this recommendation for support of the On-Site Program (see Plan Element #1 of revised plan) and urges the 208 Board to formally recognize and endorse the program.

Comment No. 2 - The state should prepare guidelines for town ordinances and continually recommend new alternative systems as new technological information becomes available.

RESPONSE: Senate Bill 143 is currently before the Senate Judiciary Committee. Passage of this bill would transfer the on-site rule-making authority to the Secretary of the Agency of Environmental Conservation. Rules adopted by the Secretary would be recommended guidelines for those towns which adopt ordinances and would include

a. a model municipal ordinance,
b. standards for site evaluation, design, installation, and maintenance,
c. other standards necessary to protect water quality and to administer the program, and
d. authority to approve innovative systems.

The revised 208 Plan also appropriates $40,000 for research into alternative on-site systems for use in Vermont (see Plan Element #9). Based on this research and review of information from outside of Vermont, a sewage advisory committee (Plan Element #5) will make recommendations to the Secretary on the use of alternative systems statewide.

Comment No. 3 - There is no need for a study of the cost effectiveness of better on-site management. The legislators are already convinced of this and are prepared to promote increased funding of the on-site program.

RESPONSE: The 208 staff agrees and has terminated the "cost effectiveness" contract which had been initiated prior to the public hearings.

Comment No. 4 - There is no need to know which towns are effective in managing on-site systems and which are not. It is time for the state to stop studying and begin assisting towns where there is a recognized need for assistance.

RESPONSE: The 208 staff feels that it is important to evaluate the effectiveness of on-site programs in the individual towns but it agrees that a separate study to determine this is not appropriate. The importance of such an evaluation is to determine which administrative arrangements have proven to be "workable" so that direct assistance programs to towns without ordinances may be

more effective in developing programs with a higher likelihood of success. Rather than performing a separate study to evaluate administrative arrangements in the towns as was originally proposed, the revised on-site plan recommends using these funds for a direct assistance program to help towns in implementing effective on-site controls (see Plan Element #4). One of the initial phases of this assistance program will include an evaluation of those towns which lack adequate regulatory mechanisms as well as to identify towns with existing or potential water quality problems resulting from rapid growth, soil or site limitations, or other factors.

Comment No. 5 - Do not need a clearinghouse. Professionals in the field keep uptodate with the field on their own.

RESPONSE: 208 staff agrees. A clearinghouse already exists within the Protection Division of the AEC as well as within the Vermont Natural Resources Council (as part of its Sewage Program).

Comment No. 6 - The plan should clearly spell out the role of the state; AEC and Health; Health Officers; local government; districts; and others who participate and who should participate in the management of on-site systems.

RESPONSE: 208 staff feels that this is an excellent recommendation and has included such a summary of the roles of the various state, regional, and local organizations involved in the implementation of the on-site plan.

Comment No. 7 - Maintenance of septic systems should be a goal of local governments and of the Conservation District On-Site Program. The state should increase its funding of the On-Site Program to promote this maintenance.

RESPONSE: 208 staff agrees and has included funding for the development of maintenance programs as part of Plan Element #4, as well as in the budget request promoted in Plan Element #1.

Comment No. 8 - All persons who provide professional services to towns or individual homeowners should be state certified. There should be no grandfathering.

RESPONSE: The 208 staff feels that a statewide certification program for all individuals who perform site evaluations or who design on-site systems for individual homeowners would be unnecessary and politically unfavorable at the present time. On the other hand, the staff feels that certification of individuals performing site evaluations and designs under the state's subdivision, campground, and trailer park regulations would be a more reasonable approach to the problem of ensuring quality control of on-site waste disposal systems. Systems requiring approval under state regulations are generally larger (hence significantly greater wastewater flows) than for individual homes and the associated threat of water pollution or public health hazard is also greater for these systems. Ensuring quality control for these high volume systems is felt to be the logical first step in any statewide certification program (see Plan Element #6).

Comment No. 9 - The state regulations concerning groundwater protection should be adjusted to permit towns to achieve their own needs.

RESPONSE: The 208 staff feels that groundwater protection standards in the current Health Regulations should be modified so as to provide adequate protection

without being overly restrictive. On the other hand, the staff feels that minimum standards are appropriate, especially since it is the state and not the towns which is mandated in the statutes to protect Vermont's water quality. The staff realizes that some towns with soil and site limitations are reluctant to adopt ordinances due to the current standards (i.e., four feet to seasonal high water) which would limit development or require costly site modifications. The staff feels that the needs of the towns can most appropriately be met by evaluating the existing standards to ensure adequate groundwater protection without being overly restrictive. Plan Element #10 addresses this issue.

Comment No. 10 - Soil identification procedures should be used in place of the perc test.

RESPONSE: The Protection Division of the AEC, which was responsible for writing Parts I, II, and III of the Health Regulations, has been investigating this issue of soil evaluation methods and will recommend appropriate changes to the sewage advisory committee or the Secretary.

Comment No. 11 - A standard technical manual is not needed.

RESPONSE: The 208 staff agrees, especially in light of the anticipated revisions to the Part II regulations which will occur over the next year.

Comment No. 12 - The regulations do not need to be revised for clarity.

RESPONSE: The regulations already have been clarified and rewritten in a simpler format by the Windham Regional Planning & Development Commission.

Comment No. 13 - Health officers can't bring about enforcement actions which are not health related. Water pollution control is out of the hands of local government.

RESPONSE: Health officers were never intended to enforce water pollution control laws. That is the role of the Department of Water Resources' water resource investigators. The enforcement of water pollution laws is out of the hands of local government. The role of local government is to notify the Department of Water Resources of a suspected or documented violation.

Comment No. 14 - The state should require inspection of septic systems.

RESPONSE: The staff feels that local government should be responsible for administering on-site waste disposal including inspections.

Comment No. 15 - The University of Vermont should conduct studies on regulatory standards - not the state Agency of Environmental Conservation.

RESPONSE: The Agency of Environmental Conservation was intended to supervise rather than perform the actual research. The research shall be performed under contract and UVM, depending on the specific proposal(s) which it submits, may be selected to perform the research. On the other hand, the contract(s) may be performed by independent consultants.

Comment No. 16 - The plan should be revised to reflect the comments given at the public hearings and resubmitted for public review.

RESPONSE: 208 staff agrees.

APPENDIX C

STATE OF VERMONT
AGENCY OF ENVIRONMENTAL CONSERVATION

INTERIM STORMWATER MANAGEMENT POLICY

Stormwater runoff that is collected and discharged to waters of the State constitutes a discharge of "wastes" requiring a permit under Chapter 47 of the Title 10 V.S.A. The Agency of Environmental Conservation has historically issued Discharge Permits in such cases and has required a minimum level of treatment of the stormwater prior to discharge. This treatment usually required the removal of readily settleable solids and floatable material in trap type catch basins or by means of settling ponds in the case of runoff from large paved areas.

The Water Resources Board ruled in June 1978 that these practices were not in detailed technical conformance with the State Water Quality Standards and therefore did not qualify for Discharge Permits. The Board recognized that material changes would have to be made in law, regulations and administrative procedures to rectify this disparity and suggested that Temporary Pollution Permits might be issued in the interim. The Agency in administering a permit program must accept this guidance from the Water Resources Board and actions have been initiated to issue Temporary Pollution Permits to all pending and new applications for the discharge of stormwater.

Implicit in this action is the adoption of a treatment policy which will be utilized during the coming months, until a revised regulatory framework can be implemented. The policy below summarizes those treatment standards. Permits will be issued with the provision that additional treatment may be required as a result of the program changes being developed. These interim actions are necessary to insure continuance of orderly governmental actions in the administration of the permit program under 10 V.S.A. Chapter 47, its interrelationship with other state permit programs and the industrial, commercial and domestic growth of Vermont.

I. New Stormwater Discharges

A. All stormwater runoff that is collected and piped, channeled or otherwise conveyed directly or indirectly or by connection to an existing storm drainage system (including existing Municipal, State or Federal systems), to waters of the State, including discharges to "wells", requires a Temporary Pollution Permit pursuant to 10 V.S.A. §1265 prior to discharge.

B. All stormwater runoff discharges identified in (A) above from paved or substantially impervious areas require the following treatment prior to discharge:

(1) Paved Roads

(a) With curbing gutters or collection facilities:

Treatment to remove readily settleable solids and floatable material including oil and grease, by means of the following treatment devices:

(i) Catch basins, or equivalent structures, with a minimum of 18" sump depth below outlet pipe invert and a submerged outlet, or

(ii) Settling pond with submerged outlet.

(b) Without curbing, gutters or collection facilities:

Treatment and control of runoff velocity may be required on a case by case basis.

(2) Paved Parking Areas

(a) Total surface area less than 0.5 acres.

Treatment of stormwater runoff in parking lots of less than 0.5 acres should, in most instances, be accomplished by the following methods (in order of preference):

(i) Perimeter drainage of the parking lot (french drain).

(ii) Grassed buffer strips designed to transmit sheet overland flow.

(iii) Settling ponds as in I (B) (1) (a) (ii) above.

(iv) Catch basins as in I (B) (1) (a) (i) above.

Greater degrees of treatment may be required in areas of special water quality concern.

(b) Total surface area greater than or equal to 0.5 acres

Provide storage and subsequent subsurface disposal or slow discharge of filtered effluent from the first 0.5 inches of runoff from the paved area. Runoff in excess of 0.5 inches may be diverted and discharged directly to receiving waters without treatment.

(c) Monitoring and reporting may be required based on use of the paved parking area and the classification and quality of the receiving waters.

(3) Other Paved Areas. Some degree of treatment may be required; to be evaluated on a case by case basis.

(4) Substantially Impervious Un-Paved Areas (other than undisturbed natural terrain) and Un-Paved Roads

Some degree of treatment and/or velocity (erosion) control may be required. To be evaluated on a case by case basis.

C. All other stormwater runoff discharged identified will be reviewed on a case by case basis including velocity (erosion) control if needed.

D. All Temporary Pollution Permits utilizing catch basins, settling basins, and storage lagoon requirements will have mandatory cleaning, maintenance and reporting requirements to ensure efficiency of treatment. Parking lot and street cleaning operations will be encouraged.

E. Stormwater management requirements in (A) through (D) above will be unchanged until, at least, July 1, 1980 unless Federal or State laws or regulations governing stormwater management dictate otherwise.

II. Existing Stormwater Discharges

The priority activity of the Agency related to stormwater management during the next two years will be to develop a legal/regulatory framework upon which a sound management program can be undertaken and the issuance of Temporary Pollution Permits to new discharges of stormwater. Low priority will be devoted to short term activities such as conversion of existing stormwater discharge permits to temporary pollution permits and the issuance of new temporary pollution permits

to existing stormwater discharges which have not yet received an original permit.

III. Effective Date

This policy shall become effective upon the date of signing and shall remain in effect until July 1, 1980 unless Federal or State laws or regulations governing stormwater management dictate otherwise.

Reginald A. LaRosa 7/14/78
Reginald A. LaRosa Date
Acting Commissioner
Department of Water Resources

Approved:

Brendan J. Whittaker 7/17/78
Brendan J. Whittaker Date
Secretary
Agency of Environmental Conservation

APPENDIX D

APPENDIX D

State of Vermont

AGENCY OF ENVIRONMENTAL CONSERVATION

Montpelier, Vermont 05602

OFFICE OF THE SECRETARY

Department of Fish and Game
Department of Forests, Parks, and Recreation
Department of Water Resources
Division of Environmental Engineering
Division of Environmental Protection
Natural Resources Conservation Council

FOR PUBLIC RELEASE

The State of Vermont wishes to remind all dam owners who may be conducting or contemplating sediment removal operations at their facilities that such activities generally have serious effects on water quality, fisheries and supporting aquatic life. It is the responsibility of the Agency of Environmental Conservation to assure that water quality standards are maintained and aquatic habitat is not damaged during sediment removal operations. Consequently, there is a need to monitor these operations and to regulate them where appropriate.

Dam owners also have certain responsibilities in this matter. The argument that discharging sediment downstream only involves putting silt and nutrients back into the stream that were originally there does not apply. Proper techniques to control reservoir sedimentation can be beneficial to the dam owner and will significantly reduce unnecessary downstream damages.

Control of reservoir sedimentation may be accomplished by providing for sediment accumulation in the design of the reservoir, venting of the sediment by use of gated outlets to encourage movement of high concentration of sediment in suspension through the dam, removing of the sediment periodically by hydraulic or mechanical means, and reducing sediment yield through construction of vegetative screens or watershed structures. Our experience indicates past practice has been to remove this sediment by venting or by mechanical means.

To provide appropriate direction and to fulfill our responsibility, it is the policy of the Agency of Environmental Conservation:

1. That the Agency (Department of Water Resources) be notified prior to all sediment removal operations and provided with an appropriate description and detailed proposal and timing of the activity.

2. Since the proposed activity may fall under several statutes, a determination will be made whether the activity is applicable under "Dams" (Title 10, Chapter 43), "Management of Lakes and Ponds" (Title 29, Chapter 11), "Stream Alteration" (Title 10, Chapter 41) or, a so-called "1272 Order" (Title 10, Chapter 47).

3. Venting of the sediment will normally be processed under a "1272 Order" issued by the Secretary. This order will require certain actions and precautions as developed jointly by the Owner, the Water Quality Division, and the Fish and Game Department to eliminate or minimize water quality standard violations. Also, the order will specify that the Agency be notified of the actual dates of the activity so Water Quality, Fish and Game personnel, or Water Resource Investigators, can be present during the operation.

4. Removal of sediment by hydraulic or mechanical means will be processed under the permitting procedures of one of the other statutes listed in Item 2 above.

Individuals who have further questions or comment should contact one of the following personnel of the Department of Water Resources, Water Quality Division (Telephone 828-2761): A. Peter Barranco, Dam Safety Engineer; Donald Manning, Environmental Engineer.

1/7/80
Date

Brendan J. Whittaker, Secretary

APPENDIX E

APPENDIX E

State of Vermont

AGENCY OF ENVIRONMENTAL CONSERVATION
MARTIN L. JOHNSON
Secretary

Montpelier, Vermont 05602
OFFICE OF THE SECRETARY

Department of Fish and Game
Department of Forests and Parks
Department of Water Resources
Environmental Board
Division of Environmental Protection
Division of Recreation
Division of Planning
Natural Resources Conservation Council

November 14, 1975

AGENCY POLICY ON CONNECTIONS TO MUNICIPAL FACILITIES DISCHARGING INTO THE WATERS OF THE STATE UNDER A TEMPORARY POLLUTION PERMIT

A portion of the administration of the water pollution control act involves consideration of requests to increase volume of waste water discharged to municipal sewage collection-treatment facilities which are discharging into the waters of the State under the terms of a temporary pollution permit. Application to make such connections involve projects subject to Act 250, public building and mobile home park statutes, and the subdivision and tent and campground regulations, as well as sources not subject to state land use and building regulations. Municipal sewer facilities operating under temporary, pollution permits include primary treatment plants, secondary treatment plants operating above design treatment capacity or producing inadequately treated effluent, and municipally owned sewage collection systems which discharge without any treatment.

Authority to issue temporary pollution permits for such facilities and to permit additional connections to such facilities during the term of a temporary pollution permit is set forth in 10 V.S.A. Section 1265. This memorandum establishes Agency policy to implement the provisions of that Section.

A.-1. A permittee with a primary treatment plant receiving an annual average flow less than the design treatment capacity, and producing an effluent quality equal to or better than the effluent quality specified in its temporary pollution permit, will be permitted to utilize the uncommitted reserve capacity of the treatment plant provided the permittee is in substantial compliance with the terms of the temporary pollution permit, and provided such additional flows will not reduce the effluent quality below that specified in the permit.

2. A permittee with a primary treatment plant receiving an annual average flow equal to or greater than the design treatment capacity shall not be permitted new connections unless (a) the treatment plant, as demonstrated by laboratory analysis, is determined by the Water Resources Department to have an actual treatment capacity greater than design treatment capacity and would not discharge a greater quantity of pollutants at some higher flow rate than would have been discharged at design flow and primary treatment efficiency, or (b) the permittee takes some action which would reduce flow below the design treatment capacity while maintaining effluent limitation or (c) the permittee takes some action to increase the plant's efficiency so as to discharge a quantity of pollutants equal to or less than that produced by the properly operating primary treatment plant at the design capacity. If the Department determines that the actual treatment capacity of a sewage treatment plant is greater than design treatment capacity, the permittee shall be permitted to utilize the added capacity of the plant in accord with (1) above.

3. A permittee with a secondary treatment plant receiving an annual average flow less than the flow limitation specified in the permit (design treatment capacity) but not meeting secondary effluent quality limitations shall be permitted to use the uncommitted reserve capacity of the plant provided the permittee is in substantial compliance with the terms of the temporary pollution permit issued to direct correction of plant deficiencies.

4. A permittee with a secondary treatment plant receiving an annual average flow equal to or greater than the design treatment capacity shall not be permitted new connections unless (a) the treatment plant, as demonstrated by laboratory analysis, is determined by the Water Resources Department to have an actual treatment capacity greater than design treatment capacity and would not discharge a greater quantity of pollutant at some higher flow than would have been discharged at design flow and secondary treatment efficiency, or (b) the permittee takes some action which would reduce the annual average flow below the design treatment capacity while retaining the efficiency of treatment, or (c) the permittee takes some action to increase the treatment plant's efficiency so as to discharge a quantity of pollutants equal to or less than that produced by the properly operating secondary treatment plant at the design flow.

5. A permittee with a sewage collection system but no treatment facilities will be permitted connections from new sources to the sewer collection system where:

(a) the governing body of the municipality approves of the new connection, and

(b) the new connection and any new connections made during the current year represent a rate of growth not exceeding the average rate of growth in that community within the past five year period, and

(c) the new connection has no other reasonable means of sanitary waste disposal available such as septic tank and leach field, etc., and

(d) the new connection does not require extension of the municipal sewer collection system, and

(e) the municipality is in substantial compliance with the terms of its temporary pollution permit.

B. Irrespective of the foregoing; if:

1. In the opinion of the Department of Water Resources, any further discharge will have or contribute to an irreversible effect on the receiving waters or will be unreasonably destructive to the quality of the receiving water, connection will not be permitted.

2. Where additional connections will result in a particular health hazard which is identified by state or local health officials no connection will be permitted.

3. Any existing source of pollution within a sewered area will be permitted to connect to a sewerage system.

C. The following general considerations will be applied:

1. The flow to the sewage treatment plant shall be expressed as an annual average flow derived from the flow data for the preceding twelve month period.

2. The average growth rate of a municipality for the preceding five year period shall be determined from information submitted to the Water Resources Department by the governing body of that municipality and may be supplemented by information contained in the files of the Agency and State Planning Office.

3. The uncommitted reserve capacity of a treatment plant shall be determined by subtracting from the design treatment capacity, the sum of the annual average flow for the preceding twelve month period and the estimate aggregate sanitary sewage flow of all subdivision, public building, mobile home park, travel trailer park, and Act 250 permits which have been issued, and any projects which have been approved by the municipality, within the served area of the sewer system proposing connection to the sewerage system and which have not been built. The determination of uncommitted reserve capacity and the state's approval or disapproval of a connection shall be made by the Department of Water Resources.

4. The Water Resources Department shall make reserve capacity determinators semiannually during the months of July and January and these shall be in effect until the next semiannual determination.

Martin L. Johnson, Secretary of
Environmental Conservation

October 19, 1979

CONNECTION POLICY

The purpose of this document is to set down the manner of computing the uncommitted reserve capacity of operating sewage treatment plants, and to define the relevent terms and procedures used in such computation.

ANNUAL AVERAGE FLOW: This shall be computed for the preceding twelve (12) months, using the monthly average flows reported by the municipality on discharge monitoring reports. The monthly average flows shall include wet and dry weather periods, night and day periods and may be adjusted from time to time as significant errors are found in flow metering/ recording equipment. The Annual Average Flow shall be expressed in units of gallons per day.

APPROVED CONNECTIONS FLOW: The flow estimated to emanate from approved connections shall be that flow computed by the Permits Section or the Protection Division based upon full occupancy or usage of the proposed connection. This flow will be assumed to represent the annual average flow, expressed as gallons per day from the proposed connection.

DESIGN CAPACITY: The design capacity of the treatment plant shall be the hydraulic capacity (30-day average flow) specified in the discharge permit or temporary pollution permit.

DISCUSSION

The use of annual average flow to a plant has been adopted for purposes of managing new connection approvals because it represents a relatively stable number yielding a relatively stable reserve capacity from which committments can be made and on which orderly and reliable municipal planning can be founded. It was also selected because the use of average flows over longer time periods would tend to reflect unrealistically low flows, and be insensitive to recent connections. The use of a 12-month average is necessary to accurately balance

the effect of normal wet periods (spring snow melt) against normal dry periods (July thru September).

The use of shorter periods for purposes of averaging, say the month, week or day, would subject the computation of reserve capacity to wide fluctuations. One result of this would be to deny many new connections during spring time high flows, only to reverse and approve the same connections during summer low flows.

Sewage treatment plants are designed based upon several factors, and like all engineering endeavors have built in safety factors which are intended to insure that the plant will perform at or above its rated capacity. The approval of new connections based upon average flow to the treatment plant; therefore, does not automatically lead to effluent violations during that increment of the average period in which flows are above the average. Allowing a plant to operate at an average flow equal to its design rating presumes that the instantaneous flow will exceed the average 50% of the time and be under the average 50% of the time. This inate assumption was inherent in the design of the plant, and is explicitly recognized in permit effluent limits which allow for variations around a specified average.

The estimation of flows from proposed connections based upon full usage or occupancy is conservative and will normally mitigate against approving connections with collective flows greater than the actual reserve capacity. The full occupancy flow is not necessarily the peak expected flow. As approved connections are built and turned operational their flows pass through the flow meter, are recorded as the annual average flow, and therefore are deleted from commitments against the computed reserve capacity. Because the estimated flow is conservatively high the actual increase in flow through the plant does not approach the design limit as rapidly as would be computed by the summation of approved connections.

New connections to a treatment facility must contribute flow to the plant for a full 12-month period to accurately reflect increases in the average plant flow. Where large new connections are approved, contributing significant fractions of the total flow to the plant, the department may make allowances for the fact that less than a full 12-months contribution from the connection has been received when computing reserve capacity for new connections. Special allowances in computing reserve capacity may also be made for new connections discharging sluge or unusually high peak flows and for industrial or other abnormal wastes.

A community may realize the added benefits of increased plant treatment capacity by taking positive and sustained actions to A) demonstrate by laboratory analysis that the plant is capable of meeting permit effluent limits while treating flows in excess of its permitted hydraulic capacity, B) causing a permanent reduction in base infiltration to the plant, C) enhancing treatment efficiencies by chemical coaulant addition or other alterations to the treatment process. Such actions will be evaluated on a case-by-case basis and if approvable will be reflected in an amended permit.

APPENDIX F

APPENDIX F

INTERIM REPORT
TO THE
VERMONT LEGISLATURE
PURSUANT TO THE
PHOSPHORUS DETERGENT BAN STUDIES
AS MANDATED BY THE PHOSPHORUS DETERGENT BAN
10 V.S.A., CHAPTER 10, SUBCHAPTER 5.

VERMONT AGENCY OF ENVIRONMENTAL CONSERVATION
DEPARTMENT OF WATER RESOURCES
WATER QUALITY DIVISION

1979

INTRODUCTION

The phosphorus detergent ban legislation (10 V.S.A., Chapter 10, Subchapter 5) mandates that the Vermont Department of Water Resources conduct an extended study to:

I. Evaluate the effectiveness of the phosphorus detergent ban in reducing phosphorus levels in point discharges to the aquatic environment;

II. Evaluate the effectiveness of the phosphorus detergent ban in reducing phosphorus loadings to the aquatic environment;

III. Evaluate the effect of the phosphorus detergent ban on ambient levels of total phosphorus, chlorophyll-a, dissolved oxygen and Secchi transparency in bodies of water receiving point source waste discharges.

This study is to be completed by the year 1981. The following report is a summary of activities conducted by the Vermont Department of Water Resources during 1977 and 1978 toward the completion of the study. Included are the results of Parts I and II of the study. A sampling program is presently being conducted and will be continued in order to provide the data base necessary to complete Part III of the study.

SUMMARY

1) Eight wastewater pollution control facilities were sampled in the summers of 1977 and 1978 by the Vermont Department of Water Resources in order to determine the magnitude of reductions in effluent phosphorus concentration and loadings brought about by the implementation of the Vermont Phosphorus Detergent Ban (10 V.S.A., Chapter 10, Subchapter 5) on April 1, 1978.

2) Phosphorus concentrations in the effluents of the eight wastewater pollution control facilities averaged 8.6 mg/l phosphorus in 1977 and 3.7 mg/l phosphorus in 1978, an average total phosphorus concentration reduction of 57%.

3) Total phosphorus loading from the eight wastewater pollution control facilities studied was 488 lbs. of phosphorus per day in 1977 and 205 lbs. of phosphorus per day in 1978, a 58% reduction in total phosphorus loading. Per capita phosphorus loading from the eight wastewater pollution control facilities was 3.19 lbs. of phosphorus/capita/year in 1977 and 1.34 lbs. of phosphorus/capita/year in 1978.

4) Total flow from the eight combined wastewater pollution control facilities showed a 9% increase from 1977 to 1978.

5) Biological Oxygen Demand (BOD_5) in the combined primary effluents averaged 161 mg/l in 1977 and 146 mg/l in 1978, a decrease of 9%, indicating a relatively consistent effluent quality from 1977 to 1978 among the primary plants. BOD_5 in the secondary effluents averaged 8.74 mg/l in 1977 and 3.37 mg/l in 1978, a 61% decrease. This figure indicates a general increase in 1978 in the operational efficiency of the three secondary facilities sampled, and may be a factor in the phosphorus reductions experienced at these facilities.

Pre-Ban Sales

In order to determine as closely as possible the extent to which nonphosphate detergents were being utilized prior to the implementation of the phosphorus detergent ban records of 1977 first quarter sales of a major Vermont general wholesaler were tabulated. The assumption is made that these sales records are more or less typical of the industry in general. Detergent sales by weight were determined. The total amount of detergent material handled by this distributor during the time period in question was 2,729 tons, broken down as follows:

- 77% of the total was in the form of laundry detergents containing an average of 7.2% phosphorus by weight.

- 15% of the total was in the form of dishwashing detergents, exempt from the phosphorus detergent ban and with an average phosphorus content of 8.4% by weight.

- 8% of the total was in the form of laundry detergents containing less than 0.5% phosphorus by weight.

Personal communications with other distributors and retailers in Vermont during 1977 indicate that the above figures accurately reflect the general detergent distribution patterns prior to the phosphorus detergent ban.

By September 1977, efforts were started to empty retail shelves of phosphorus detergents. Wholesale distribution was ceased as of December 21, 1977 and by April, 1978, it can be safely assumed that phosphorus detergent sales in Vermont had ceased.

A store survey in January, 1978, indicated that even at this point in time many stores had totally eliminated phosphorus laundry detergents from their inventories (e.g., Grand Union). Most stores were at different points in the transition to phosphorus free detergents.

I. Wastewater Pollution Control Facility Sampling

In order to accomplish Part I of the study, intensive effluent sampling was conducted at twelve wastewater pollution control facilities during the summer of 1977 prior to the implementation of the phosphorus detergent ban, and again at the same wastewater pollution control facilities during the summer of 1978, subsequent to the implementation of the phosphorus detergent ban. All wastewater pollution control facilities sampled are located in the Lake Champlain Basin and discharge directly to either the Winooski River or Otter Creek. Both primary and secondary treatment facilities are included in the survey. Wastewater pollution control facilities capacity measured by average flow ranges from 0.015 million gallons per day (MGD) to 5.150 MGD.

Effluent sampling in both 1977 and 1978 was conducted over a 72 hour period. Discrete grab samples were collected once every four hours throughout the 72 hour period. Each sample was separately analyzed for total phosphorus for the purpose of phosphorus reduction evaluation, and biological oxygen demand, in order to measure the relative quality of the effluent and to detect any malfunctions in the operation of the plant during the course of the study.

Effluent flows for the study period were obtained from the flow records maintained by individual wastewater pollution control facility operators. The results of the total phosphorus and biological oxygen demand analyses were averaged to obtain a mean value for each parameter for each effluent during the 72 hour period of sampling. A mean flow value was also calculated for the same time period. These 72 hour mean values are used to calculate changes in concentrations and loadings from 1977 to 1978.

Data

Of the twelve wastewater pollution control facilities originally sampled, the data from four was not used in the following calculations due to apparent malfunctions during the 1977 study period (as evidenced by excessive fluctuations in biological oxygen demand levels) or lack of adequate flow data (Appendix I). Data from the eight remaining water pollution control facilities was compiled and summarized in order to evaluate changes in phosphorus discharges from 1977 to 1978.

The eight wastewater pollution control facilities are characterized as follows:

A) Five primary treatment plants:

1) So. Burlington - receives a mixed industrial/ residential influent.

2) Essex Village - receives a mixed urban/ residential influent.

3) Rutland Town - receives primarily residential influent.

4) Proctor - receives primarily residential influent.

5) Rutland City - receives mixed urban/industrial/ residential influent.

B. Three secondary treatment plants;

1) Winooski - extended aeration type - receives an urban/residential influent.

2) Burlington North End - activated sludge type receives 99% residential influent.

3) Burlington Riverside - activated sludge type receives mixed urban/residential/industrial (college laboratories, hospital) influent.

The following is a summation of the wastewater pollution control facilities data:

1) Effluent total phosphorus concentrations at eight facilities ranged from 3.2-16 mg/l phosphorus in 1977, averaging 8.6 mg/l P. Concentrations in 1978 ranged from 1.8-5.9 mg/l phosphorus, averaging 3.7 mg/l P. This is an average 57% phosphorus concentration reduction. Total phosphorus concentration reductions at individual wastewater pollution control facilities ranged from 34-73%.

2) Total phosphorus loading from the eight wastewater pollution control facilities studied was 488 lbs. of phosphorus per day in 1977 and 205 lbs. of phosphorus per day in 1978, a 58% reduction in phosphorus loading. Phosphorus loading reductions at the individual facilities ranged from 25-70%.

3) Phosphorus loading per capita was calculated using population figures listed in Wastewater Pollution Control Facilities, Project Status Report, Division of Environmental Engineering, Agency of Environmental Conservation, Nov. 1978. Per capita loading in 1977 averaged 3.19 lbs. phosphorus/capita/ year and in 1978 averaged 1.34 lbs. phosphorus/capita/year, a 58% reduction. Per capita loadings at individual wastewater pollution control facilities ranged from 1.22-4.96 lbs. phosphorus/ capita/year.

4) Biological oxygen demand in the combined primary effluents averaged 161 mg/l in 1977 and 146 mg/l in 1978, a 9% decrease. This is not a significant change and indicates a relatively good consistency of primary effluent quality from the 1977 and 1978 sampling periods.

Biological oxygen demand in the secondary effluents averaged 8.74 mg/l in 1977 and 3.37 mg/l in 1978, a 61% decrease. Of the three secondary facilities sampled, two (Winooski and Burlington Riverside) showed substantial decreases in biological oxygen demand from 1977 to 1978 (81% and 48%, respectively). The third secondary facility showed a slight (12%) increase in biological oxygen demand.

The increased operational efficiency (as evidenced by substantial biological oxygen demand decreases) of the Winooski and Burlington Riverside facilities may partially account for phosphorus concentration and loading reductions experienced at these two facilities.

The following is a summary of data for each individual wastewater pollution control facility.

*-Standard Deviation
BOD_5 - biological oxygen demand
MGD - million gallons per day
[P] - phosphorus concentration

Winooski - Winooski River
Secondary - Extended Aeration

	1977	1978	% Change
[P] mg/l (St_d.Dev.)*	6.7(1.9)	2.7(0.4)	-60
BOD_5mg/l (Std.Dev.)	16(5.7)	3.0(1.0)	-81
Flow MGD	0.444	0.600	+26
P-Loading lbs/day	25	14	-44
Capita P Loading lbs P/cap/year	1.22	0.69	-44

Essex Junction - Winooski River
Primary

	1977	1978	% Change
[P] mg/l (Std.Dev.)	8.3(1.1)	4.4(0.9)	-47
BOD_5mg/l (Std.Dev.)	148(32)	122(27)	-18
Flow MGD	0.848	0.624	-26
P Loading lbs/day	58	23	-61
Capita P Loading lbs P/cap/year	3.25	1.28	-61

Burlington - Riverside - Winooski River
Secondary - Activated Sludge

	1977	1978	% Change
[P] mg/l (Std.Dev.)	3.2(0.5)	1.8(0.5)	-44
BOD_5mg/l (Std.Dev.)	6.7 (2.4)	3.5(2.0)	-48
Flow MGD	0.816	0.708	-13
P Loading lbs/day	21.8	11	-51
Capita P Loading lbs P/cap/year	1.59	0.77	-51

Burlington - North End - Winooski River
Secondary - Activated Sludge

	1977	1978	% Change
[P] mg/l (Std.Dev.)	6.5(0.9)	3.0(0.2)	-54
BOD_5mg/l (Std.Dev.)	3.3 (1.5)	3.8(1.7)	+12
Flow MGD	1.041	1.290	+19
P Loading lbs/day	56	32	-43
Capita P Loading lbs P/cap/year	2.06	1.18	-43

South Burlington - Airport Parkway - Winooski River
Primary

	1977	1978	% Change
[P] mg/l (Std.Dev.)	10.2(1.2)	6.8(0.6)	-33
BOD_5mg/l (Std.Dev.)	167(26)	146(25)	-13
Flow MGD	0.62	0.72	+13
P Loading lbs/day	53	41	-23
Capita P Loading lbs P/cap/year	3.52	2.72	-23

Rutland City - Otter Creek
Primary

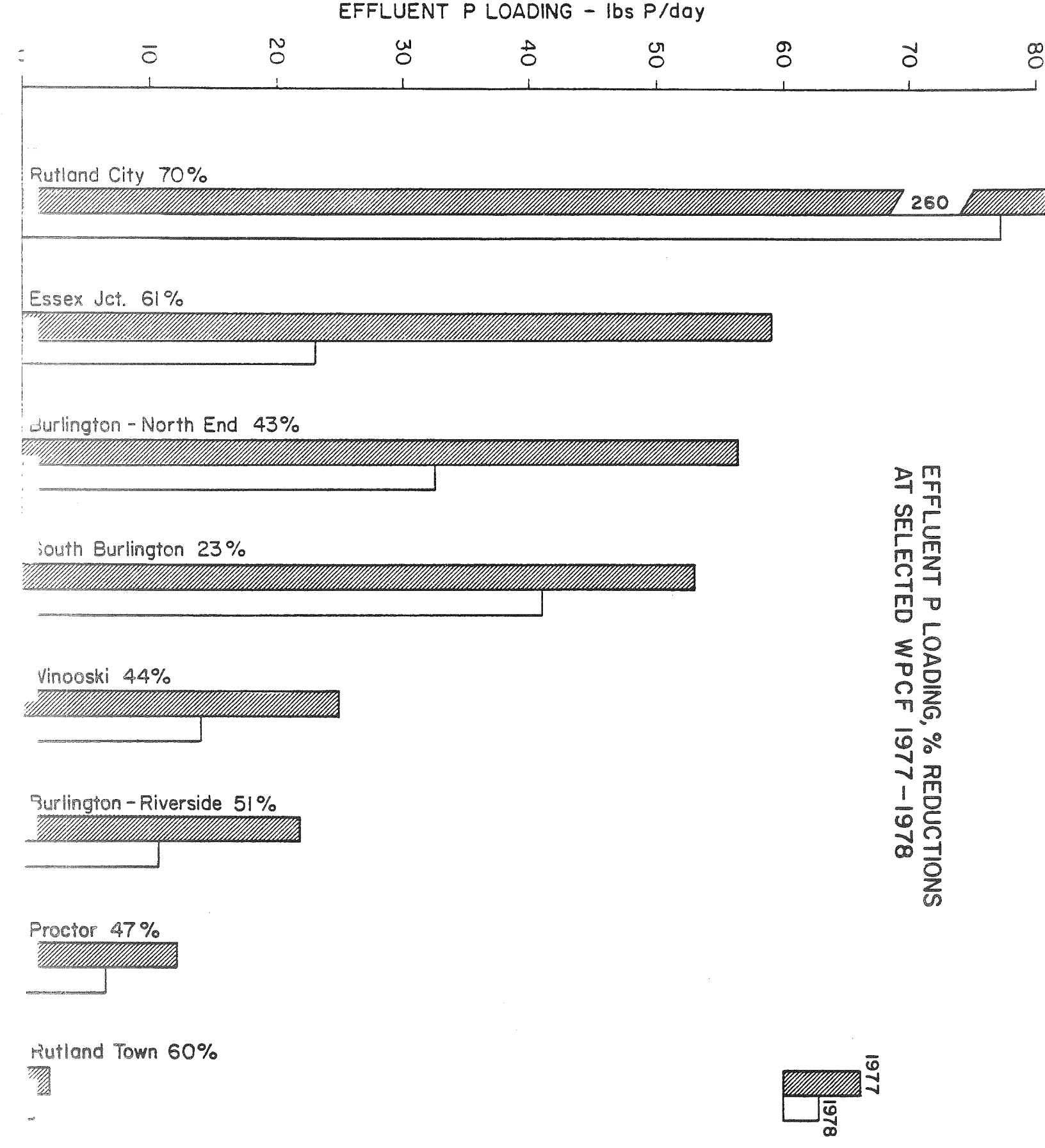
	1977	1978	% Change
[P] mg/l (Std.Dev.)	6.7(2.7)	1.8(0.5)	-73
BOD_5mg/l (Std.Dev.)	100 (35)	90(47)	-10
Flow MGD	4.575	5.150	+11
P Loading lbs/day	260	77	-70
Capita P Loading lbs P/cap/year	4.96	1.46	-70

Rutland Town - Otter Creek
Primary

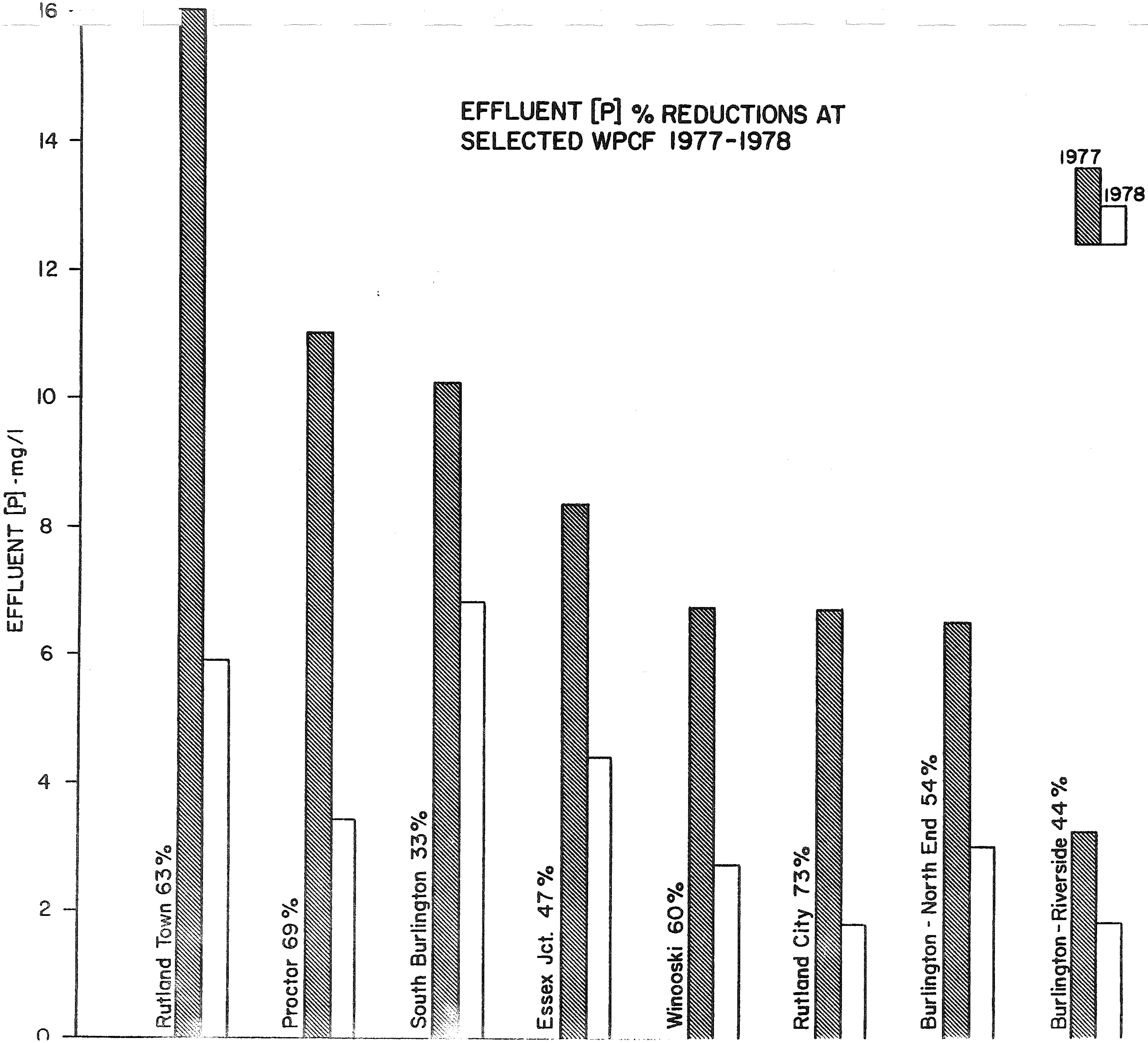
	1977	1978	% Change
[P] mg/l (Std.Dev.)	16(6.0)	5.9(2.4)	-63
BOD_5mg/l (Std.Dev.)	220(53)	206(58)	- 6
Flow MGD	0.015	0.016	+ 6
P Loading lbs/day	2	0.79	-60
Capita P Loading lbs P/cap/year	2.23	0.88	-60

Proctor - Otter Creek
Primary

	1977	1978	% Change
[P] mg/l (Std.Dev.)	11(4.0)	3.4(0.7)	-69
BOD_5mg/l (Std.Dev.)	170(31)	166(44)	- 2
Flow MGD	0.129	0.224	+42
P Loading lbs/day	12	6.4	-47
Capita P Loading lbs P/cap/year	2.23	1.17	-47



EFFLUENT P LOADING, % REDUCTIONS AT SELECTED WPCF 1977-1978



EFFLUENT [P] % REDUCTIONS AT SELECTED WPCF 1977-1978
1977
1978
EFFLUENT [P] -mg/l
16
14
12
10
8
6
4
2
0
Rutland Town 63%
Proctor 69%
South Burlington 33%
Essex Jct. 47%
Winooski 60%
Rutland City 73%
Burlington - North End 54%
Burlington - Riverside 44%

In "A Survey of P Levels in Treated Municipal Wastewater" (JWPCF, April 1978), Gakstatter reported an average phosphorus concentration of 6.1 mg/l P from 709 wastewater pollution control facilities with no phosphorus removal facilities and no detergent ban. An average phosphorus concentration of 2.7 mg/l P was reported from 25 wastewater pollution control facilities operating under the Indiana phosphorus detergent ban. Although the absolute values obtained from the Vermont survey are higher the reduction in phosphorus concentration is nearly identical - 58% in Vermont, 56% in Indiana. Also, in the same report, the Indiana phosphorus detergent ban is said to account for a 50% reduction in per capita loading, as compared to a 58% figure obtained by the Vermont study.

The Metropolitan Sanitary District of Greater Chicago reported phosphorus concentration reductions in wastewater pollution control facility effluents of 46% five months after the implementation of a citywide phosphorus detergent ban and a reduction in phosphorus loading of 67.6%.

To summarize, effluent phosphorus concentration and loading reductions experienced at eight Vermont wastewater pollution control facilities under the phosphorus detergent ban are similar to reductions found in other areas of the country operating under a phosphorus detergent ban.

Lake Sampling

During the open-water seasons of 1977 and 1978, fourteen lake stations were monitored on a weekly basis for total phosphorus and chlorophyll-a concentrations, and Secchi transparency. These stations were located as follows:

Lake Champlain - 9 stations
Lake Memphremagog - 1 station
Lake Elmore - 2 stations
Keyser Lake - 2 stations

The data is presently being reviewed and will be included in future reports.

River Sampling

During the open-water seasons of 1977 and 1978, five river stations were monitored on a weekly basis for total phosphorus and chlorophyll-a concentrations. The stations were located at the respective mouths of the following rivers:

Winooski River - Burlington
Lamoille River - Milton
Black River - Newport
Barton River - Newport
Clyde River - Newport

The data is presently being reviewed and will be included in future reports.

APPENDIX I

West Rutland[1/] Otter Creek
Secondary - extended aeration

	1977	1978	% Change
[P] mg/l (Std. Dev.)	17(4.4)	2.0(1.04)	-88
BOD_5 mg/l (Std. Dev.)	25(53)	14(12)	-45
Flow MGD	0.095	0.162	+58
P-Loading lbs. P/day	13	2.7	-79
Capita P loading lbs. P/cap/year	2.11	0.44	-79

Pittsford[1/] Otter Creek
Secondary - extended aeration

	1977	1978	% Change
[P] mg/l (Std. Dev.)	13(5.1)	1.7(0.5	-87
BOD_5 mg/l (Std. Dev.)	36(35)	24(5.5)	-34
Flow MGD	0.033	0.059	+44
P-Loading lbs. P/day	3.6	0.84	-77
Capita P loading lbs. P/cap/year	2.02	0.47	-77

Essex Town[1/] Winooski River
Primary

	1977	1978	% Change
[P] mg/l (Std. Dev.)	5.0(0.77)	2.3	-54
BOD_5 mg/l (Std. Dev.)	162(61)	85	-48
Flow MGD	0.029	0.032	+ 9
P-Loading lbs. P/day	1.2	0.6	-50
Capita P loading lbs. P/cap/year	0.44	0.22	-50

Colchester[1/] - Winooski River
Secondary - extended aeration

	1977	1978	% Change
[P] mg/l (Std. Dev.)	7.0(4.22)	3.4	-51
BOD_5 mg/l (Std. Dev.)	56(102)	3.9	-93
Flow MGD	0.155	0.135	-13
P-Loading lbs. P/day	9.1	3.8	-58
Capita P loading lbs. P/cap/year	1.66	0.69	-58

1/ Data not included in calculations due to wastewater pollution control facility operational upset during the 1977 sampling period.

APPENDIX G

An act to add 10 V.S.A. §§ 921, 922 and 923 relating to conservation and development;

Sec. 1. 10 V.S.A. § 921 is added to read:

§ 921. AQUATIC NUISANCE CONTROL PROGRAM

(a) The department of water resources shall establish and maintain an aquatic nuisance control program.

(b) The aquatic nuisance control program shall perform the following services:

(1) receive and respond to aquatic nuisance complaints;

(2) work with municipalities, local interest organizations, and private individuals to develop long-range programs regarding aquatic nuisance controls;

(3) work with federal, state and local governments to obtain funding for aquatic nuisance control programs; and

(4) administer chemical permits under section 905(14), of Chapter 37 of Title 10.

(c) For the purposes of an aquatic nuisance control program, "aquatic nuisance" means undesirable or excessive substances or populations that interfere with the recreational potential of a body of water. Aquatic nuisances may include, but are not limited to, rooted aquatic vegetation, algal populations and sediment deposits.

(d) For future fiscal years, the department shall submit line item requests for funding of the aquatic nuisance control program.

Sec. 2. Appropriation

For the fiscal year beginning July 1, 1978, $20,000.00 is appropriated to the department of water resources to provide funds for the aquatic nuisance program.

Sec. 3. 10 V.S.A. § 922 is added to read:

§ 922. MUNICIPAL PARTICIPATION

(a) The department of water resources shall receive requests from any city, town or agency of the state to consider waters for control. To participate in such a program a city, town or agency must contribute a minimum of 25 percent of the total cost as determined by the department of water resources. In approving requests and determining the amount of any contribution the department shall consider the following:

(1) the use of the waters by persons outside of the city or town in which the waters are located;

(2) the long-range effect of the control program;

(3) the recreational use of the waters; and

(4) the effectiveness of municipal shoreland zoning controls in minimizing or preventing development from having any adverse effects on the waters subject to the control program.

(b) The secretary shall review requests and establish priorities for control, considering public accessibility, recreational uses, the general public advantage, the importance to commercial, agricultural or other interest, the local interest herein as manifested by municipal or other contributions therefor, local efforts to control aquatic nuisances, and other considerations affectin the feasibility, necessity or advantage of the proposed work.

(c) No work authorized under this section shall begin until the department of water resources has conducted biological surveys to determine the sources of nutrients and the types and extent of nuisance aquatic growth, has evaluated water usages and aquatic nuisance control alternatives, and has developed estimates of costs for recommended alternatives.

Sec. 4. 10 V.S.A. § 923 is added to read:

§ 923. JOINT MUNICIPAL PARTICIPATION

Should the shorelands of waters for which funds are requested under this act be under more than one municipal governmental jurisdiction, the provisions herein shall apply to the respective municipalities under a joint application, except that the required municipal contribution shall be apportioned among the respective municipalities.

APPENDIX H

APPENDIX H

AGENCY OF ENVIRONMENTAL CONSERVATION

WASTELOAD ALLOCATION PROCESS

November 28, 1978

WASTELOAD ALLOCATION PROCESS: DEFINITIONS

As used in this rule, the following definitions shall apply:

ASSIMILATIVE CAPACITY - A measure of a stream's or lake's ability to accept wasteloads without degrading water quality below established water quality standards.

BENTHIC OXIDATION - Oxidation occurring on the bottom of a stream, often due to plants, animals or sludge deposits.

BIOCHEMICAL OXYGEN DEMAND (BOD) - A measure of the oxygen required to oxidize organic material usable as a source of food by aerobic organisms. BOD_5 is a measure of the oxygen required for this process for a period of five days at 20°C.

CHEMICAL OXYGEN DEMAND (COD) - A measure of the oxygen equivalent of that portion of the organic matter in a sample susceptible to oxidation by a strong chemical oxidant.

DISSOLVED OXYGEN (D.O.) - A measure of the dissolved oxygen content of water, usually expressed as milligrams per liter. Dissolved oxygen is necessary for sustaining fish and other aquatic life and is one of the most important indicators of water quality.

K-RATES - Coefficients used in stream modeling which define the rate at which various biological and physical reactions occur.

NITROGENOUS OXYGEN DEMAND (NOD) - A measure of the amount of oxygen required to convert organic nitrogen and ammonia to nitrate.

NONPOINT SOURCE POLLUTION - Pollution resulting not from a point source, such as an outfall pipe of a sewage treatment plant, but rather from diffuse sources such as overland runoff from construction areas, agricultural lands, forest lands, or groundwater-borne pollutants, such as leachate from sanitary landfills.

SEVEN-DAY LOW FLOW, TEN-YEAR RETURN PERIOD (7Q10) - A statistical measure of the magnitude and frequency of low flow in a river. It is the lowest mean flow for seven consecutive days, which has a 10% chance of occurring in any given year.

ULTIMATE OXYGEN DEMAND (UOD) - A measure of the amount of oxygen required to take the process of degradation through both the carbonaceous and nitrogenous phases.

WATER QUALITY LIMITED SEGMENT - A designated portion of rivers, streams, and lakes, where applicable water quality standards are not now and will not be met, or where it is uncertain whether they will be met even after all discharges in the segment meet effluent standards based on best practicable treatment by private discharges and secondary treatment by municipalities.

WATER QUALITY STANDARDS - The minimum or maximum limits specified for certain water quality parameters at specific locations for the purpose of managing waters to realize their most beneficial uses. In Vermont, Water Quality Standards include both Water Classification Orders and the Regulations Governing Water Classification and Control of Quality.

WATER TYPE - A designation of waters for the purpose of protecting and managing aquatic life.

To provide a fair distribution of waste assimilation capacity among all dischargers in a Water Quality Limited Segment, the use of sophisticated modeling and computer techniques must be employed to determine the assimilative capacities of the streams. Characteristics of many of Vermont's streams such as multiple dischargers, controlled flow, algal blooms, variable reach geometry, and time variable behavior make the classical Streeter-Phelps model inapplicable as a predictive tool for these streams. The method to be used may vary from case to case but the model presently used is a waste assimilation model developed for the State of Massachusetts by the consulting firm of Quirk, Lawler and Matusky Engineers. This model is a steady state Ultimate Oxygen Demand (UOD) and Dissolved Oxygen (DO) model with an unsteady-state option that includes consideration of diurnal variation in DO due to photosynthetic activity.

For each Water Quality Limited Segment two statistically reliable data sets will be used for modeling purposes, irrespective of the specific model employed. One data set will serve as a basis for calibrating the model, the second will be used for verification purposes. Calibration involves the determination of model coefficients while verification is the test of whether the calibrated model accurately predicts observed conditions. A model may be used for prediction only after it has been adequately verified.

For consistency in the determination of waste assimilation capacity, all dissolved oxygen sources and sinks must be considered. These include the following:

Oxygen Sinks	Oxygen Sources
Biochemical Oxygen Demand (BOD)	Reaeration
Chemical Oxygen Demand (COD)	Photosynthetic activity
Benthic Oxidation	High DO water inputs
Aquatic Plant Respiration	
Nitrogenous Oxygen Demand (NOD)	
DO deficient inputs	

All discharges that significantly impact the dissolved oxygen concentration in a stream, based on considerations of frequency and/or magnitude, shall be included in assimilative capacity determinations. Such discharges shall include but not be limited to municipal and industrial discharges, nonpoint sources, stormwater runoff and combined sewer overflows.

Care must be exercised in the determination of several variables which are used in the modeling effort. A discussion of the value to be used or the method of determining several of the important and sensitive parameters which are used in the assimilative capacity determination is given below:

1. Flow - The design flow is the seven day mean low flow with a ten year return period (7Q10) which has been adopted by the Water Resources Board. Rule 7 of the Vermont Water Quality Standards states: "Water quality classification standards and associated requirements shall apply in all instances except during periods when the low natural stream flow is less than the consecutive seven (7) day mean low flow with a ten (10) year return period". This 7Q10 flow is accepted as the design flow by virtually all governmental entities and will be used in these modeling efforts. It includes both a frequency factor and a duration factor in order to provide the stream ecology a certain degree of protection.

2. Temperature - The design temperature will be the average daily temperature which can reasonably be expected to occur at the 7Q10 flow.

3. K-rates - K-rates (deoxygenation and reaeration) for both carbonaceous and nitrogenous demands will be calculated based on actual sampling data and not from literature data.

4. Aquatic Plant Photosynthesis/Respiration - The diurnal dissolved oxygen fluctuations caused by aquatic plants are a very important variable in the modeling process and will be included in the model. Graphs of measured dissolved oxygen vs. time for at least a 24 hour period are more desirable than light-dark bottle analysis in determining maximum respiration and oxygen production from aquatic plants since the light-dark bottle analysis does not include the effect from rooted aquatics.

5. Background - Assumptions of the various background variables used in the model are extremely important in calculating the assimilative capacity. The variables BOD, nitrogen, and dissolved oxygen will be measured during periods of low flow and warm temperatures in order to calculate average background concentrations to use in the model. When upstream point sources, whether existing or projected, significantly influence the assimilative capacity or wasteload allocation in the Water Quality Limited Segment, they will be included as separate inputs to the water quality model and not included in the background assumptions. Nonpoint sources of oxygen-demanding wastes will be included in the background assumptions and as a uniform waste input in the modeled segment.

It is recognized that a seasonal variation in a stream's temperature and biological activity occurs and that the waste assimilation capacity of a stream fluctuates accordingly. Therefore, the assimilative capacity of Water Quality Limited Segments will, at a minimum, be calculated for a summer and a winter season based on temperature, k-rates, aquatic plant respiration/photosynthesis, 7Q10 flow, and background inputs that are consistent with the season in question.

The determination of a stream's capacity to assimilate wastes and the subsequent allocation of pollutant loads shall include consideration of the normal seasonal, daily, and diurnal variations above the minimum dissolved oxygen standards. This is consistent with Rule 6 of the Vermont Water Quality Standards.

Wasteload Allocation Process
Part B, Development and Adoption of a Wasteload Allocation

The process for allocating the assimilative capacity of a particular Water Quality Limited Segment among competing dischargers in the Segment shall be as follows:

1. For any Water Quality Limited Segment the development process for a wasteload allocation, as set forth in the following paragraphs, shall not commence prior to

a. Notification by the Secretary of the initiation of such action. The Secretary shall cause such notice to be published in a newspaper having general circulation in the affected area and shall notify by direct mailing all affected municipalities, regional planning commissions, and other interested parties; and

b. A determination of the water management type by the Water Resources Board including an opportunity for a public hearing for interested parties.

2. Based on assimilative capacity studies, a minimum of three alternative wasteload allocations will be prepared by the Department of Water Resources. Alternatives will include:

a. Uniform effluent limitations to all dischargers based on treatment plant design flow projections.

b. Allocations based on wasteloads for each discharger at existing and projected populations or population equivalents which are planned to be served.

c. Best practical wastewater treatment for all dischargers, then selectively increasing the required treatment level for facilities with the most impact on the river due to size or location until water quality standards are attained.

3. Other wasteload allocations which appear to be reasonable in the judgement of the Secretary for the situation under consideration may be prepared and may include consideration of future demands.

4. To develop wasteload allocation alternatives and determine projected populations and wastewater flows, town officials, regional planning commissions and the State Planning Office will be consulted. Town plans, zoning ordinances, capital investment plans and regional plans will also be considered in developing alternative wasteload allocations.

5. Informational materials to explain each of the alternatives will be prepared for use at public meetings and hearings and for the interested public at large. This material will also provide information on the rationale for and implications of each of the alternatives with a statement specifying which one is preferred by the Department of Water Resources and why.

6. A minimum of two public meetings will be held for each Water Quality Limited Segment at a convenient location in the river basin. The first will be a public informational meeting to explain the wasteload allocation proposed by the Department of Water Resources and the other alternatives. The second will be a public hearing in accordance with 3 V.S.A. Chapter 25 (Administrative Procedures Act) to accept comments on the proposed wasteload allocation for the purpose of amending the State Water Quality Management Plan. All comments on the proposed allocation will be recorded and considered by the Department of Water Resources and their resolution presented to the Secretary of the Agency.

7. The wasteload allocation will be adopted as a part of the State Water Quality Management Plan by signature of the Secretary and will be implemented through the permit process.

8. Appeals to the wasteload allocation will be to the Water Resources Board per 10 V.S.A. 1269.

9. The Secretary will initiate a review of such wasteload allocation as a proposed rule amendment under Title 3, Chapter 25 not later than 5 years after the date on which the allocation becomes effective.

The Secretary will also consider petitions requesting amendment of a wasteload allocation under 3 V.S.A. §806. If any such petition is filed not less than 2 years after the date on which the allocation becomes effective and is signed by not less than 25 interested persons, by a governmental subdivision or agency, or by an association having not less than 25 members, the Secretary shall forthwith initiate rulemaking proceedings and shall not deny consideration of such petition on the merits. Whether an amendment is considered upon the initiative of the Secretary or by petition, the disposition of the proposal shall be within the sound judgement of the Secretary, in accordance with 3 V.S.A. Chapter 25.

APPENDIX I

APPENDIX I

STATISTICS- 78 O.H.M. VT

Total number reported incidents - 114
Number that reached surface waters - 51
Number that reached groundwater - 18
Number of oil spills - 93
Number of hazardous materials spills - 20
Number of fish kills - 2
Algae blooms - 1

Cause of Spills

Above ground tanks, pipelines, etc. - 17
Under ground tanks, pipelines, etc. - 17
Truck accidents - 16
Overfills - 14
Car/bus spills - 9
Improper disposal - 6
Seepages (saturated ground) - 6
Miscellaneous - 5
Other truck spills - 4
Process upset - 3
Service station problems - 3
Mystery spills - 3
No spill - 3
Vandalism - 2
Hose movement, failure or drainage - 2
Barge,vessel spills - 1
Railroad accident - 1
Road oiling - 1
Deliberate dumping - 1

Quantity Spilled

≤100 gal.	= 54
>100 - ≤500	= 15
>500 - ≤1000	= 4
>1000 - ≤5000	= 9
>5000 - ≤10000	= 1
>10000	= 1
Miscellaneous	= 5
Unknown(minor, slick)	= 22
No spill	= 3

Products Spilled

Diesel & #2 F.O.	= 36
Gasoline	= 37
Crankcase(waste oil)	= 4
Milk	= 4
# 4 F.O.	= 3
# 6 F.O.	= 3
Polychlorinated Biphenyls	= 2
Lube oil/grease	= 2
Sulfuric acid	= 2
Hydraulic oil	= 2
Tar/asphalt	= 1
Algae	= 1
X-ray equipment	= 1
Hydrazine	= 1
Mixed chemicals	= 2
Pavement sealer	= 1
Pyrethrin insecticide	= 1
Creosote	= 1
Liquid fertilizer(16-8-12)	= 1
Urea fertilizer	= 1
Transil oil	= 1
Sodium hydroxide	= 1
Cleaning solvent	= 1
Carbon dioxide	= 1
Propane	= 1
Kerosene	= 1
Unknown oil/sheen	= 3

Month Spills Occurred

Jan.	8	July	6
Feb.	6	Aug.	9
March	14	Sept.	7
April	8	Oct.	8
May	14	Nov.	12
June	17	Dec.	5

STATISTICS - 1979 O.H.M. VT.

Total number of reported incidents - 150
Number that reached surface waters - 76
Number that reached groundwater - 9
Number of oil spills - 118
Number of vapor releases - 7
Number of hazardous materials spills - 30
Number of fish kills - 1
Pollen, algae, insects, etc. - 2

Cause of Spills

Truck accidents - 31
Underground tanks, pipelines, etc. - 16
Mystery spills - 13
Overfills - 12
Miscellaneous - 12
Above ground tanks, pipelines, etc. - 11
Other truck spills - 9
Vandalism - 6
Railroad accidents - 4
Improper disposal - 4
Car/bus accidents - 4
Separator problems - 3
Seepage-saturated ground - 3
Deliberate dumping - 3
Other human error - 3
Other Service Station problems - 3
Road Oiling - 2
Lagoon Failure - 2
Transformer, capacitor failure - 2
Hose movement, etc. - 2
Poor Housekeeping - 2
Acts of God - 1
Barge/Vessel - 1
Plane Accident - 1

Quantity Spilled

≤100 gal.	= 56
>100 - ≤500	= 25
>500 - ≤1000	= 13
>1000 - ≤5000	= 7
>5000 - ≤10000	= 2
>10000	=
Miscellaneous	= 13
Unknown (minor, sheen)	= 34

Products Spilled

Diesel & #2 F.O.	= 51
Gasoline	= 25
Unknown & Miscellaneous/oil	= 14
Crankcase oil	= 6
#6 F.O.	= 7
Propane	= 5
Kerosene	= 3
Milk	= 3
Chlorine	= 2
Lube Oil	= 2
Perchloroethylene & Trichloroethylene	= 2
Undercoating compound	= 2
Hydraulic Fluid	= 2
#4 F.O.	= 2
Aviation gas	= 1
Asphalt	= 1
Liquid Oxygen	= 1
Process Waste	= 1
Sodium hydrosulfite	= 1
Pollen	= 1
Mercury	= 1
Antifreeze	= 1
Xylene/toluene	= 1
Lime slurry	= 1
Paint sludge	= 1
Transformer oil	= 1
Sodium Hydroxide	= 1
Insects	= 1
Transil oil	= 1
Polychlorinated biphenyls	= 1
Polyethylene	= 1
Hydrofluosilicic Acid	= 1
Lime	= 1
Mixed fertilizers & Pesticides	= 1
Leachate	= 1
Ammonia	= 1
Mixed chemicals	= 1
Tear gas grenade	= 1

Months Spills Occurred

Jan.	11	July	12
Feb.	14	Aug.	7
March	16	Sept.	8
April	16	Oct.	9
May	9	Nov.	21
June	11	Dec.	16

APPENDIX J

KEY TO WATER QUALITY INVENTORY OF SEGMENTED RIVER MILES

CLASSIFICATION

NOTE (1) STATUS: EL-1 - Effluent Limitation Segment (presently meets water quality standards)
EL-2 - Effluent Limitation Segment (presently not meeting water quality standards)
WQ-1 - Water Quality Segment (for parameters or wastes noted)
WQ-2 - Water Quality Segment (with existing pollution discharge to upland stream)

USE: CLASS B waters suitable for bathing and recreation, irrigation and agricultural uses; good fish habitat; good aesthetic value, acceptable for public water supply with filtration and disinfection.

CLASS C waters are suitable for recreational boating, irrigation of crops not used for consumption without cooking, habitat for wildlife and for common food and game fishes indigenous to the region; and such industrial uses as are consistent with other Class uses.

NOTE (2) WATER QUALITY STANDARDS VIOLATED

The majority of the segmented stream miles indicating elevated coliform levels as a water quality problem are listed because of temporary violations of the technical standards for swimmable waters as a result of nonpoint surface runoff and point source runoff resulting from stormwater and/or combined sewer overflows.

NOTE (3) USE: Number in parentheses ( ) indicates number of Class C miles in each segment.

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: BATTENKILL-WALLOOMSAC-HOOSIC (BASIN #1)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION USE	(1) STATUS	SEGMENTED STREAM MILES TOTAL	VIOLATED W.Q.S.	W.Q.S. VIOLATED(2)	WATER QUALITY PROBLEM	CURRENT STATUS
1-1	Hoosic R.- Mass. State Line to Pownal	C(2.5)(3)	EL-2	2.5	2.5	Coliform	Municipal & Industrial Wastes	
1-2	Hoosic R.-Pownal to N.Y. State Line	C(5.0)	WQ-1	5.0	5.0	D.O. Coliform	Tannery Wastes Municipal Wastes	Water Quality Survey Pending-Assimilative Capacity
1-3	Walloomsac R.-Bennington to Paran Creek	B	EL-2	5.5	0	Coliform	Combined Sewer Overflows & Stormwater	
1-4	Walloomsac R.-Paran Creek to N.Y. line	C(2.0)	WQ-1	2.0	2.0	D.O. Coliform	Municipal & Industrial Wastes	Water Quality Survey Pending-Assimilative Capacity
1-5	Paran Creek-S. Shaftsbury to Walloomsac R.	B	EL-1	5.0				
1-6	No Name Brook-Fairdale Farms to Walloomsac R.	C(1.5)	EL-2	3.0	1.5	Coliform	Dairy Wastes	
1-7	Batten Kill R.-Manchester Center Depot to Arlington	C(3.9) B	EL-1	11.5	0			New secondary municipal facility operational segment upgraded to EL-1-Recommend Class C zone be shortened.
1-8	Batten Kill R.-Arlington to N.Y. State Line	B	EL-2	7.0	2.0	Coliform	Municipal Wastes Untreated	
1-9	Warm Brook & Roaring Brook-Fayville Branch to Batten Kill R.	C(1.0)	EL-2	2.0	2.0	Coliform	Sanitary Wastes	

(1), (2), (3) - Refer to Key for explanation.

APPENDIX J

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: POULTNEY-METTAWEE (BASIN #2)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION (1) USE	STATUS	SEGMENTED STREAM MILES TOTAL	VIOLATED W.Q.S.	W.Q.S. VIOLATED (2)	WATER QUALITY PROBLEM	CURRENT STATUS
2-1	Mettawee R.-Pawlet to N.Y. State Line	C(2.5) (3)	EL-2	8.0	2.5	Coliform	Municipal Waste (untreated) Nonpoint runoff Potential thermal problems	
2-2	Poultney R. Poultney to Castleton R.	C(3.0) B	EL-1	9.0	0			Water Quality Survey Pending Assim. Capacity
2-3	Poultney R.-Castleton R. to Hubbardton R.	B	EL-1	5.0	0			
2-4	Poultney R.-Hubbardton R. to Lake Champlain	B	EL-1	7.0	0			
2-5	Castleton R.-Castleton to Poultney R.	C(3.6) B	EL-1	7.0	0			Water Quality Survey Pending Assim. Capacity
2-6	Tributary to Hubbardton and Hubbardton R.-Benson STP to Poultney R.	C(3.0)	EL-1	8.0	0			

(1), (2), (3) - Refer to Key for explanation.

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: OTTER CREEK (BASIN #3)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION USE	CLASSIFICATION STATUS (1)	SEGMENTED STREAM MILES TOTAL	SEGMENTED STREAM MILES VIOLATED W.Q.S.	W.Q.S. VIOLATED (2)	WATER QUALITY PROBLEM	CURRENT STATUS
3-1	Otter Creek-Danby to Wallingford	B	EL-1	9	0			
3-2	Otter Creek-Wallingford to Rutland	C(1.8) (3) B	EL-1	8	0			
3-3	Otter Creek-Rutland, to Pittsford	C(11.5)	WQ-1	11.5	6.0	D.O. Coliform	Municipal Wastes, Combined Sewer Overflows, Stormwater	Water Quality Study completed for Assimilative Capacity- Waste-load allocation currently being assigned
3-4	Otter Creek-Pittsford to Neshobe R.	B	EL-1	8	0			
3-5	Otter Creek-Neshobe R. to Middlebury	B	EL-1	21	0	Coliform	Municipal Wastes	
3-6	Otter Creek-Middlebury to Vergennes	C(4.0) B	EL-2	16	0		Municipal Wastes (Primary Facility) Combined Sewer Overflows Stormwater	
3-7	Otter Creek-Vergennes to Lake Champlain	C(4.0) B	EL-2	8	0		Combined Sewer Overflows-Stormwater	New Secondary Municipal Facility operational Recommend Class C zone be shortened
3-8	Clarendon R.-W. Rutland to Otter Creek	C(2.0)	EL-1	2	0		Municipal Wastes	
3-9	Neshobe R.-Brandon to Otter Creek	C(1.8)	EL-1	2	0			

(1),(2),(3) - Refer to Key for explanation.

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: LOWER LAKE CHAMPLAIN-UPPER LAKE CHAMPLAIN-LAPLATTE, MALLETTS BAY, ST. ALBANS BAY, ROCK, PIKE (BASIN #4 & #5)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION USE	CLASSIFICATION STATUS (1)	SEGMENTED STREAM MILES TOTAL	SEGMENTED STREAM MILES VIOLATED W.Q.S.	W.Q.S. VIOLATED (2)	WATER QUALITY PROBLEM	CURRENT STATUS
4-1	L. Champlain-South Bay to Crown Point	B	WQ-1	Lake	--	S.S.	Industrial Wastes Phosphorus	
4-2	East Creek-Orwell to Lake Champlain	C(2.3) (3) B	EL-2	4	0	D.O.	Natural condition	Natural condition causes Dissolved Oxygen Problem. New secondary municipal facility operational
4-3	L. Champlain-Crown Point to Addison-Chittenden County Line	B	WQ-1	Lake	--		Phosphorus	
5-1	LaPlatte R.-Hinesburg to Shelburne	C(4.6) B	WQ-1	8.0	0	D.O.	Municipal Wastes Industrial and Phosphorus	
5-2	LaPlatte R.-Shelburne to L. Champlain	C(1) B	WQ-1	2	0	D.O.	Municipal Wastes, Phosphorus	
5-3	Stevens Brook-St. Albans to L. Champlain	C(5.5) B	WQ-1	6	2	D.O.	Municipal Wastes, Industrial and Phosphorus Combined Sewer Stormwater Overflows	
5-4	Lake Champlain-Shelburne Bay	B	WQ-1	Lake	--		Phosphorus	Class C zones need to be established for Shelburne FD #1 and South Burlington. Bartlett's Bay Treatment Facility
5-5	Lake Champlain-Burlington Harbor	B	WQ-1	Lake	--		Phosphorus, Combined Sewer Overflows & Stormwater	Class C zone needs to be established for Burlington Main Treatment Facility

(CONTINUED)

(1), (2), (3) - Refer to Key for explanation.

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: Basin #4 and #5(cont.)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION (1) USE	STATUS	SEGMENTED STREAM MILES TOTAL	VIOLATED W.Q.S.	W.Q.S. VIOLATED(2)	WATER QUALITY PROBLEM	CURRENT STATUS
5-6	Lake Champlain-St. Albans Bay	B	WQ-1	Lake	--		Phosphorus	
5-7	Main Lake-Addison-Chittenden County Line to Canadian Border	B	WQ-1	Lake	--		Phosphorus	
5-8	Indian Brook-Colchester to L. Champlain	C(1.0) (3) B	WQ-2	2	2	Rule 12	Sanitary Wastes	
5-9	Malletts Bay(Inner & Outer)	B	WQ-1	Lake	--		Phosphorus	
5-10	Missisquoi Bay	B	WQ-1	Lake	--		Phosphorus	
5-11	Lake Champlain-Northeast Malletts Bay to Hog Island	B	WQ-1	Lake	--		Phosphorus	
5-12	McCabes Brook-Shelburne STP to LaPlatte River	C(1.0)	WQ-1	1	0	D.O.		Natural condition causes Dissolved Oxygen Problem. Secondary municipal facility operational

(1),(2),(3) - Refer to Key for explanation.

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: MISSISQUOI (BASIN #6)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION USE	CLASSIFICATION STATUS (1)	SEGMENTED STREAM MILES TOTAL	SEGMENTED STREAM MILES VIOLATED W.Q.S.	W.Q.S. VIOLATED (2)	WATER QUALITY PROBLEM	CURRENT STATUS
6-1	Missisquoi R.-Troy to Canada Line	C(1.0)(3) B	EL-2	11.0	3.0	Coliform	Dairy & Municipal Wastes	
6-2	Missisquoi R.-Canada Line to Enosburg Falls	C(1.0) B	EL-2	17.0	0	Coliform	Municipal Wastes	Status of Canadian Discharges unknown
6-3	Missisquoi R.-Enosburg Falls to Sheldon Springs	C(1.9) B	EL-1	12.0	0			New secondary facility made operational-dairy waste being treated at latter facility. Segment upgraded to EL-1
6-4	Missisquoi R.-Sheldon Springs to Swanton	C(1.5) B	EL-1	15.0	0			New secondary facility made operational. Segment upgraded to EL-1
6-5	Missisquoi R.-Swanton to Lake Champlain	C(1.0) B	WQ-1	8.0	0		Phosphorus	Secondary facility operational
6-6	Trout R.-Montgomery to Missisquoi R.	C(1.0) B	EL-1	6.0	0			Domestic discharges corrected. Segment upgraded to EL-1
6-7	Black Creek-East Fairfield to Missisquoi R.	C(1.0) B	EL-2	12.0	5.0	Coliform	Domestic(Industrial) Wastes	
6-8	Mud Creek-Newport Center to Canada Line	B	EL-2	7.0	3.0	D.O. Coliform	Municipal Wastes (Untreated)	Discharge is presently contemplated. Segment changed to EL-2
6-9	Burgess Branch to confluence with Missisquoi R.	B	EL-1	5.0	0		Industrial Wastes/ Ground Water from Asbestos Mine	Individual Waste eliminated. Segment upgraded to EL-1

(1),(2),(3) - Refer to Key for explanation.

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: LAMOILLE (BASIN #7)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION USE	CLASSIFICATION STATUS (1)	SEGMENTED STREAM MILES TOTAL	SEGMENTED STREAM MILES VIOLATED W.Q.S.	W.Q.S. VIOLATED (2)	WATER QUALITY PROBLEM	CURRENT STATUS
7-1	Lamoille R.-Hardwick to Morrisville	C(0.9) (3) B	EL-1	15	0			New secondary facility made operational. Segment upgraded to EL-1
7-2	Lamoille R.-Morrisville to Hyde Park	C(0.7) B	EL-1	6	0			Secondary facility operational
7-3	Lamoille R.-Hyde Park to Johnson	C(1.0) B	EL-1	9	0			
7-4	Lamoille R.-Johnson to Fairfax	C(2.0) B	EL-1	27	0			Secondary facility operational. Segment upgraded to EL-1
7-5	Lamoille R.-Fairfax to Milton	C(1.5) B	EL-1	8	0			New secondary facility made operational. Segment upgraded to EL-1
7-6	Lamoille R.-Milton to Lake Champlain	C(3.0) B	EL-2	9	3	D.O. Coliform	Municipal Wastes & Natural Cuases (Untreated)	
7-7	Brewster R.-Madonna Mountain Corp. to Lamoille R.	B	WQ-2					
7-8	Brown's R.-Jericho to Lamoille R.	B	WQ-2	16	3	Coliform	Domestic Wastes	

(1),(2),(3) - Refer to Key for explanation.

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: WINOOSKI (BASIN #8)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION USE	CLASSIFICATION STATUS (1)	SEGMENTED STREAM MILES TOTAL	SEGMENTED STREAM MILES VIOLATED W.Q.S.	W.Q.S. VIOLATED (2)	WATER QUALITY PROBLEM	CURRENT STATUS
8-1	Winooski R.-Marshfield to Plainfield	C(3.9) (3) B	EL-1	7	0			New secondary facility made operational. Segment upgraded to EL-1
8-2	Winooski R.-Plainfield to Stevens Branch	C(3.6) B	EL-1	9	0			Secondary facility operational. Segment upgraded to EL-1
8-3	Winooski R.-Stenves Branch to Dog River	C(4.0)	EL-1	4	0		Combined Sewers & Stormwater Overflow	
8-4	Winooski R.-Dog R. to Waterbury	C(2.0) B	EL-1	9	0			
8-5	Winooski R.-Waterbury to Alder Brook	C(2.7) B	EL-1	22	0			New secondary facility made operational. Segment upgraded to EL-1
8-6	Winooski R.-Alder Brook to Lake Champlain	C(16.5) B	WQ-1	17	4	D.O. Coliform	Municipal & Industrial Wastes, Combined Sewers & Stormwater Overflow	Water Quality Survey Completed for Assimilative Capacity
8-7	Jail Branch-East Barre to Stevens Branch	C(3.3) B	EL-1	4	0			
8-8	Stevens Branch-Williamstown to Jail Branch(Barre)	B	EL-1	6	0			Potential Toxics Problem
8-9	Stevens Branch-Jail Branch (Barre) to Winooski R.	C(6.0)	WQ-1	6	0	D.O. Coliform	Municipal Wastes, Combined Sewers & Stormwater Overflow	Water Quality Survey Completed for Assimilative Capacity, Wasteload Allocation Underway
8-10	Dog R.-Northfield to Winooski R.	C(1.0) B	EL-1	10	0			

(CONTINUED)

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: Basin #8 (cont.)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION USE	CLASSIFICATION STATUS (1)	SEGMENTED STREAM MILES TOTAL	SEGMENTED STREAM MILES VIOLATED W.Q.S.	W.Q.S. VIOLATED (2)	WATER QUALITY PROBLEM	CURRENT STATUS
8-11	Waterbury R.-Stowe to Winooski R.	C(4.5) (3) B	WQ-1	12	0		Phosphorus	
8-12	Alder Brook-Essex Center to Winooski R.	C(2.0) B	EL-2	3	0	Coliform	Municipal Wastes	
8-13	Allen Brook-Williston to Winooski R.	C(5.0)	EL-2	6	0	Coliform	Municipal Wastes (Untreated)	

(1),(2),(3) - Refer to Key for explanation.

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: WHITE (BASIN #9)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION (1) USE	STATUS	SEGMENTED STREAM MILES TOTAL	VIOLATED W.Q.S.	W.Q.S. VIOLATED (2)	WATER QUALITY PROBLEM	CURRENT STATUS
9-1	White R.-Rochester to Third Branch	B	WQ-2	18	2	Coliform	Municipal Wastes	Failed municipal subsurface system
9-2	White R.-Third Branch (Bethel) to First Branch	C(3.0) (3) B	EL-2	8	4	Coliform	Municipal Wastes (Untreated)	
9-3	White R.-First Branch (So. Royalton) to Connecticut R.	C(1.5) B	EL-1	19	0			New secondary facility made operational. Segment upgraded to EL-1
9-4	Third Branch-Randolph to White R.	C(1.5) B	EL-1	8	0			
9-5	First Branch-Chelsea to White R.	C(2.0) B	EL-1	16	0			

(1),(2),(3) - Refer to Key for explanation.

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: OTTAUQUECHEE-BLACK (BASIN #10)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION (1) USE	CLASSIFICATION (1) STATUS	SEGMENTED STREAM MILES TOTAL	SEGMENTED STREAM MILES VIOLATED W.Q.S.	W.Q.S. VIOLATED (2)	WATER QUALITY PROBLEM	CURRENT STATUS
10-1	Ottauquechee R.-Killington Recreation Area to Bridgewater Corners	C(2.0) B (3)	WQ-2	10	5	Coliform	Domestic Wastes	Seasonal Class C zone 11-1 to 5-31
10-1A	Ottauquechee R.-Bridgewater Corners to Woodstock	C(2.0) B	EL-1	6	0			New secondary municipal facility made operational. Segment upgraded to EL-1
10-2	Ottauquechee R.-Woodstock to Deweys Mills Pond	C(3.0) B	EL-2	10	4	Coliform	Municipal Wastes	
10-3	Ottauquechee R.-Deweys Mills Pond to Conn. R.	C(0.9) B	EL-1	5	0			
10-4	Kedron Brook-S. Woodstock to Ottauquechee R.	C(2.0) B	EL-2	6	2	Coliform	Municipal Wastes	Secondary municipal facility operational. Segment upgraded to EL-1
10-5	Black R.-Ludlow to Cavendish	C(1.5) B	EL-1	6	0			
10-6	Black R.-Cavendish to No. Springfield Reservoir	C(2.5) B	EL-1	14	0			
10-7	Black R.-No. Springfield Reservoir to Springfield	C(2.0)	EL-2	2	1	Coliform	Municipal Wastes	
10-8	Black R.-Springfield to Conn. R.	C(6.0)	EL-1	6	0		Industrial Wastes Possible Toxic Waste Combined Sewer and Stormwater Overflow	New secondary municipal facility made operational-Segment upgraded to EL-1 Class C zone needs to be shortened

(1),(2),(3) - Refer to Key for explanation.

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: WEST-WILLIAMS-SAXTONS (BASIN #11)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION (1) USE	STATUS	SEGMENTED STREAM MILES TOTAL	VIOLATED W.Q.S.	W.Q.S. VIOLATED(2)	WATER QUALITY PROBLEM	CURRENT STATUS
11-1	Williams R.-Middle Branch (Chester) to Conn. R.	C(2.0)(3) B	EL-1	12	0			
11-2	Saxtons R.-Saxtons R. to No. Westminster	C(1.3) B	EL-1	14	0			
11-3	Saxtons R.-No. Westminster to Conn. R.	C(2.0)	EL-2	2	2	Coliform	Municipal and Wood Product Wastes	
11-4	West R.-Londonderry to Ball Mountain Dam	C(2.0) B	EL-2	10	0	Coliform	Domestic Wastes	
11-5	West R.-Ball Mountain Dam to Townshend Dam	B	EL-2	8	0	Coliform	Domestic Wastes	
11-6	West R.-Townshend Dam to Conn. R.	B	EL-2	18	0	Coliform	Domestic Wastes	
11-7	No Name Brook-Magic Mountain Inc. to South Londonderry	C(1.0)	WQ-2	4	0	Coliform	Domestic Wastes	
11-8	Mill Brook & Winhall R.-Bromley Ski Area to West R.	B	WQ-2	9	0	Coliform	Domestic Wastes	
11-9	No. Branch and Ball Mountain Brook-Stratton Corp. to West R.	C(1.0) B	WQ-2	9	0	Coliform	Domestic Wastes	

(1),(2),(3) - Refer to Key for explanation.

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: DEERFIELD (BASIN #12)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION USE	CLASSIFICATION STATUS (1)	SEGMENTED STREAM MILES TOTAL	SEGMENTED STREAM MILES VIOLATED W.Q.S.	W.Q.S. VIOLATED (2)	WATER QUALITY PROBLEM	CURRENT STATUS
12-1	No. Branch, Deerfield R.- Snow Lake to Wilmington	B	Upland	9	0			
12-2	No. Branch, Deerfield R.- Wilmington to Readsboro	C(1.0) (3) B	EL-2	12	2		Municipal Wastes	
12-3	Deerfield R.-Readsboro to Mass. State Line	C(1.0) B	EL-1	4	0			New secondary municipal facility made operational - Segment upgraded to EL-1
12-4	East Branch, North R.- Jacksonville to Mass. State Line	C(1.4) B	EL-1	9	4	Coliform	Municipal Wastes (Untreated)	

(1),(2),(3) - Refer to Key for explanation.

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: LOWER CONNECTICUT-MILL BROOK (BASIN #13)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION (1) USE	STATUS	SEGMENTED STREAM MILES TOTAL	VIOLATED W.Q.S.	W.Q.S. VIOLATED(2)	WATER QUALITY PROBLEM	CURRENT STATUS
13-1	Conn. R.-Wilder Dam to Windsor	C(2.6)(3) B	EL-2	15	5	D.O. Coliform	Municipal and Industrial Wastes	
13-2	Conn. R.-Windsor to Bellows Falls	C(1.7) B	EL-2	27	1	Coliform	Municipal and Industrial Wastes Combined Sewers & Stormwater Overflows in Bellows Falls	
13-3	Conn. R.-Bellows Falls to Brattleboro	C(1.6) B	EL-2	21	2	Coliform	Municipal and Industrial Wastes	
13-4	Conn. R.-Brattleboro to Ashuelot R.	C(2.3)	EL-2	10	5	D.O. Coliform	Municipal and Industrial Wastes	
13-5	Conn. R.-Ashuelot R. to Mass. State Line	B	WQ-1	6	1	D.O. Coliform	Municipal and Industrial Wastes	
13-6	Sacketts Brook-Putney to Conn. R.	C(1.0)	EL-1	2	0			Secondary facility made operational. Segment upgrated to EL-1

(1),(2),(3) - Refer to Key for explanation.

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: STEVENS-WELLS-WAITS-OMPOMPANOOSUC (BASIN #14)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION (1) USE	STATUS	SEGMENTED STREAM MILES TOTAL	VIOLATED W.Q.S.	W.Q.S. VIOLATED (2)	WATER QUALITY PROBLEM	CURRENT STATUS
14-1	Wells R.-South Ryegate to Conn. R.	C(2.0) (3) B	EL-2	7	3	Coliform	Municipal Wastes	
14-2	Stevens R.-Barnet to Conn. R.	B	EL-1	1	0			
14-3	Trib. to Ompompanoosuc R.-Ely to Main Stem	B	WQ-1	1	1	Potential Heavy Metals, pH	Mine Drainage	
14-4	Copperas Brook & West Branch of Ompompanoosuc-Elizabeth Mine to Main Stem	B	WQ-1	5	5	Potential Heavy Metals, pH	Mine Drainage	
14-5	Waits River-Bradford upstream municipal boundary to mouth	C(0.9) B	EL-1	2	0			New secondary facility made operational. Segment upgraded to EL-1

(1),(2),(3) - Refer to Key for explanation.

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: PASSUMPSIC (BASIN #15)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION (1) USE	STATUS	SEGMENTED STREAM MILES TOTAL	VIOLATED W.Q.S.	W.Q.S. VIOLATED(2)	WATER QUALITY PROBLEM	CURRENT STATUS
15-1	East Branch, Passumpsic R.- E. Haven to West Branch	C(1.2)(3) B	EL-1	12	0			
15-2	Passumpsic R.-West Branch to So. Johnsbury Center	C(5.3) B	EL-1	11	0			Secondary facility made operational. Segment upgraded to EL-1
15-3	Passumpsic R.-St. Johnsbury Center to Conn. R.	C(4.8)	EL-2	12	8	Coliform	Municipal, Combined Sewer Overflow and Stormwater	
15-4	Moose R.-East St. Johnsbury to Passumpsic River	C(1.1)	EL-2	5	4	Coliform	Municipal Wastes	
15-5	Water Andric Brook- Danville to Passumpsic River	C(3.8) B	WQ-1	7	2	D.O.	Municipal Wastes	

(1),(2),(3) - Refer to Key for explanation.

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: UPPER CONNECTICUT-NULHEGAN-WILLARD STREAM-PAUL STREAM (BASIN #16)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION USE	CLASSIFICATION STATUS (1)	SEGMENTED STREAM MILES TOTAL	SEGMENTED STREAM MILES VIOLATED W.Q.S.	W.Q.S. VIOLATED (2)	WATER QUALITY PROBLEM	CURRENT STATUS
16-1	Conn. R.-Canada Line to Upper Ammonoosuc	C(2.0) (3) B	EL-1	48	0			Secondary facility made operational. Segment upgraded to EL-1
16-2	Conn. R. - Upper Ammonoosuc to Comerford Dam	C(0.9) B	WQ-1	44	44	D.O. Coliform	Municipal and Industrial Wastes, Benthic Demand	
16-3	Conn. R.-Comerford Dam to Wells R.	B	EL-2	15	2	D.O. Coliform	Municipal & Industrial Wastes	
16-4	Conn. R. - Wells R. to Bradford	C(2.2) B	EL-2	18	2	Coliform	Municipal Wastes	
16-5	Conn. R.-Bradford to Wilder Dam	C(0.9) B	EL-2	32	2	Coliform	Municipal & Industrial Wastes	

(1),(2),(3) - Refer to Key for explanation.

WATER QUALITY INVENTORY SUMMARY OF SEGMENTED RIVER MILES

RIVER: LAKE MEMPHREMAGOG-BLACK-BARTON-CLYDE-COATICOOK (BASIN #17)

SEGMENT NUMBER	SEGMENT DESCRIPTION	CLASSIFICATION USE (1)	CLASSIFICATION STATUS (1)	SEGMENTED STREAM MILES TOTAL	SEGMENTED STREAM MILES VIOLATED W.Q.S.	W.Q.S. VIOLATED (2)	WATER QUALITY PROBLEM	CURRENT STATUS
17-1	Clyde R.-Island Pond to Derby Center	C(2.0) (3) B	WQ-1	21	0		Phosphorus	Secondary treatment facility made operationa. Segment upgraded to EL-1
17-2	Clyde R.-Derby Center to L. Memphremagog	C(5)	WQ-1	5	4		Municipal Wastes Phosphorus	
17-3	Lake Memphremagog	B	WQ-1	lake	--		Municipal Wastes Phosphorus Combined Sewers and Stormwater Overflow	
17-4	Barton R.-Glover to Barton	C(3.5) B	WQ-1	4	4		Municipal Wastes Phosphorus	
17-5	Barton R.-Barton to Lake Memphremagog	C(5.0) B	WQ-1	15	8		Municipal Wastes Phosphorus	
17-6	Tomifobia R.-Vt. Line to Canada Line	C(.5)	EL-2	1	.5	Coliform	Municipal Wastes Phosphorus	
17-7	Black R.-Albany to Lake Memphremagog	B	WQ-1	21	2		Domestic Wastes Phosphorus	

(1),(2),(3) - Refer to Key for explanation.