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Presumpscot River Basin Cumberland County-Tidewater Water Quality Management Plan

Bureau of Water Quality Control
Division of Water Quality
Evaluation & Planning

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JUNE, 1976





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PRESUMPCOT RIVER BASIN-CUMBERLAND COUNTY
TIDEWATER WATER QUALITY MANAGEMENT PLAN

Prepared pursuant to Section 303 (e) of the
Federal Water Pollution Control Act Amendments of 1972

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER QUALITY CONTROL
DIVISION OF WATER QUALITY EVALUATION AND PLANNING

June, 1976



STATE OF MAINE

Department of Environmental Protection

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June 14, 1976

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Mr. John A. S. McGlennon
Regional Administrator
Environmental Protection Agency
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Boston, Massachusetts 02203

Dear Mr. McGlennon:

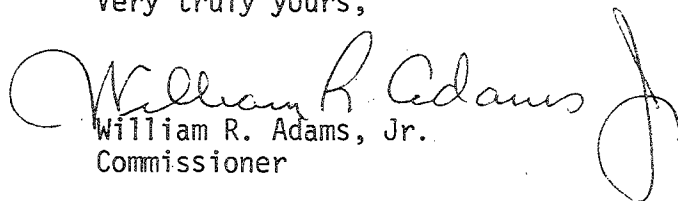
Enclosed is the Presumpscot River Basin - Cumberland County Tide-water Water Quality Management Plan prepared pursuant to Section 303 (e) of the Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) and Title 40 of the Code of Federal Regulations, Parts 130 and 131.

As indicated, the most serious water quality problems are located in the lower Presumpscot River Basin, due to presently untreated pulp and paper and municipal wastes. The region contains no lakes designated "Lake Stress Quality (LSQ)", that is no lakes which exhibit advanced stages of eutrophication caused by cultural stress. Many municipalities in the planning area are constructing waste abatement facilities which should result in significant improvements in water quality.

Draft copies of this document were distributed to municipalities, industries, sanitary and water districts, planning agencies, organizations and concerned citizens expressing an interest in the water quality and related activities within the basin. Copies of this plan were made available at the Greater Portland Council of Governments offices as well as the DEP Augusta office.

A public hearing to present this plan was made by the DEP staff at the Greater Portland Council of Governments headquarters in Portland on May 19, 1976. All comments were considered for incorporation into the final report.

Very truly yours,


William R. Adams, Jr.
Commissioner

WRA:AJC:gk

Enc.

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I. Summary, Conclusions, and Recommendations

A. Summary

Major bodies of water located in the Presumpscot River Basin are the Presumpscot, Royal and Crooked Rivers, with Sebago, Thompson, and Long Lakes being the major impoundments. Water quality within the Basin would be considered good above the S.D. Warren outfall in Westbrook. However, the paper mill effluent with an organic waste equivalent of nearly one-half million people coupled with natural and controlled low flows has historically severely degraded the quality of water below Westbrook. This degradation includes reduction in dissolved oxygen, benthic or sediment deposits, floating solids, and generally unaesthetic conditions. S.D. Warren is presently constructing a secondary treatment facility scheduled to be in operation by the October 1, 1976 deadline, which should result in the lower Presumpscot vastly improving in quality. The area as a whole is somewhat behind in the construction of municipal wastewater treatment facilities, mainly because of the impoundment of Federal construction grant monies.

There are two Water Quality Segments (WQS) located within the Basin - RM 6.7 (Westbrook) to RM 0.0 (Falmouth) on the Presumpscot and Back Cove in Portland. The condition of the former is due to the effects of S.D. Warren pollutants and the latter the result of domestic wastewater from combined sewer overflows, and urban storm drainage.

B. Conclusions

The following conclusions are presented on the water quality management activities of the Presumpscot River Basin:

1. With the exception of the two Water Quality Segments mentioned previously, the Presumpscot River Basin water quality should meet its legal classification by October 1, 1976 in terms of dissolved

oxygen. However, areas of bacterial pollution will remain at least until municipal treatment facilities are operating.

2. In the lower Presumpscot, no discharge should be allowed at 25 cfs, a discharge of 250 ppd BODu will require a streamflow of 50 cfs to maintain 5.0 mg/l DO.
3. The two Water Quality Segments will substantially improve with the construction of the S.D. Warren, City of Westbrook and City of Portland wastewater treatment facilities.
4. Lake problems in the Presumpscot River Basin are related to extensive shoreline development and increased seasonal, as well as conversion to year round use.
5. Water quality data is lacking for the lower Presumpscot tributaries and minor rivers in the Presumpscot River Basin as well as many of the Great Ponds within the Basin area.
6. Planned outputs of the Greater Portland Council of Governments "208" program will provide management tools for dealing with non-point sources of pollution, facilities plans, land use controls, etc. as well as an improved water quality data base for improved water quality management.

Recommendations:

1. S.D. Warren should maintain a minimum streamflow of 50 cfs at Cumberland Mills during their annual mill shutdown. This will allow the City of Westbrook full discharge from its proposed secondary treatment facility without violating the minimum DO standard of 5.0 mg/l.
2. Until data indicates otherwise, it would be desirable to maintain a minimum streamflow of 300 cfs at Cumberland Mills when both Westbrook and S.D. Warren are discharging.
3. Effective land use controls should be implemented where they can be shown to ultimately improve water quality.
4. An increased sampling program should be established to obtain water quality data on tributaries and Great Ponds throughout the Basin.
5. The legal classification of the Presumpscot River and other waters within the Basin should be re-evaluated once the major wastewater treatment facilities are operating to determine if the national goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water, is technologically attainable and economically feasible.
6. Continued funding of a water quality monitor on the Presumpscot should be secured.

II. Introduction

A. Purpose

This plan was prepared by the Division of Water Quality Evaluation and Planning, Bureau of Water Quality Control, Maine Department of Environmental Protection (DEP) pursuant to Section 303 (e) of the Federal Water Pollution Control Act Amendments of 1972, Public Law 92-500 (PL 92-500), and U.S. Environmental Protection Agency (EPA) Regulations published in the Federal Register, Title 40 of the Code of Federal Regulations, Parts 130 and 131 (40 CFR 130-131).

The purpose of the plan is to inventory point sources of pollution, segment priority ranking, schedule of compliance for sources, assessment of municipal needs, and load allocations for "Water Quality Segments". These requirements are that all waste sources shall receive the 'best practicable treatment' by October 1, 1976 (Title 38, Maine Revised Statutes, Annotated), or July 1, 1977 (PL 92-500), with a national goal of 'swimmable-fishable' water quality by 1983, (PL 92-500) where feasible. The latter denotes an approximate B-2 classification in Maine, the second highest standard. The entire Maine water quality classification system, (A, B-1, B-2, etc.) is described in the appendix.

B. Planning Area Description

The planning encompasses the entire Presumpscot and Royal River Basins, the tide-waters of Cumberland County extending from Scarborough northerly along the coast to Brunswick and Harpswell, and various small coastal streams. Included in the area is the Greater Portland area, the largest urban complex in Northern New England.

The area contains 104 Great Ponds (MIDAS File #906-Z)*, including Sebago Lake, Maine's second largest. This exceedingly high quality lake, under the management of the Portland Water District, is the water supply for the metropolitan Portland communities. Other impoundments of significance include Long Lake, Little Sebago Lake,

*A great pond shall include any inland body of water which in its natural state has a surface area in excess of 10 acres, and any inland body of water artificially formed or increased which has a surface area in excess of 30 acres, the shore of which is owned by 2 or more persons.

and Pleasant Lake.

The rivers of the region are of high quality for the most part, with the exception noted above, along the lower Presumpscot River below S.D. Warren Co. pulp and paper mills in Westbrook. The Presumpscot River, the region's major flowing water-course has a drainage area of 615 square miles, originates at Sebago Lake and flows 24 miles to Casco Bay after passing over ten (10) dams, nine of which are in working condition. These dams, nine of which are owned by S.D. Warren, are used for power generation and storage. A complete listing of all the dams located in the Basin area are available at the Maine State Planning Office (MIDAS File #906-Z).

The 1970 population of the area was approximately 180,000 with peak seasonal population estimated at 270,000 by the Maine State Planning Office. The table on the following page presents the populations of the area's major communities:

As can be seen from this table, the total population of the area from 1960 to 1970 rose 5.5% despite the 10.3% loss in Portland and only a 2.1% gain in South Portland. It is interesting to note that many of the smaller communities located in the lakes region of the Presumpscot River Basin gained considerable population in the 1960-1970 period. Casco, Naples, Raymond, Sebago, Standish and Windham gained 32.6, 30.1, 81.4, 29.7, 49.0 and 46.6% respectively, with Cape Elizabeth, Cumberland, Gorham, Gray, Scarborough, and Yarmouth each experiencing large population increases. The first group of communities are rural in nature, and rely almost exclusively on subsurface wastewater disposal. This rapid increase in population densities has created one of the key water quality control problems of the region. These same communities, with the addition of Bridgton, Harrison, and Otisfield all experience large seasonal increases in population, particularly along lake shorelines, another water quality problem.

The area as a whole has relatively few municipal wastewater treatment facilities operating at present. This situation will change in the very near future as the

Table 1

	<u>1960 Population</u>	<u>1970 Population</u>	<u>% Change</u>	<u>Estimated 1970 Peak Sea- sonal Population</u>	<u>GPCOG Estimated 1975 Population*</u>
Bridgton	2,707	2,967	9.6	9,415	3,350
Brunswick	15,797	16,195	2.5	20,061	N/A
Cape Elizabeth	5,505	7,873	43.0	9,213	8,400
Casco	947	1,256	32.6	5,350	1,800
Cumberland	2,765	4,096	48.1	5,299	5,000
Falmouth	5,976	6,291	5.3	7,644	6,650
Freeport	4,055	4,781	17.9	5,900	5,400
Gorham	5,767	7,839	35.9	8,365	9,400
Gray	2,184	2,939	34.6	7,131	4,300
Harpwell	2,032	2,552	25.6	8,551	N/A
Harrison	1,014	1,045	3.1	2,853	1,600
Naples	735	956	30.1	6,705	1,800
North Yarmouth	1,140	1,363	19.6	1,425	1,850
Otisfield	549	589	7.3	1,478	750
Portland	72,566	65,116	-10.3	83,988	65,100
Pownal	778	800	2.8	1,000	1,100
Raymond	732	1,328	81.4	6,157	1,750
Scarborough	6,418	7,845	22.2	12,771	10,550
Sebago	546	708	29.7	4,189	900
South Portland	22,788	23,267	2.1	25,842	23,750
Standish	2,095	3,122	49.0	7,566	5,350
Westbrook	13,820	14,444	4.5	15,868	14,700
Windham	4,498	6,593	46.6	11,261	9,200
Yarmouth	<u>3,517</u>	<u>4,654</u>	<u>32.3</u>	<u>5,888</u>	<u>6,200</u>
Total	178,931	188,839	5.5	273,918	188,900

*These figures prepared by GPCOG are pending review and are subject to revision.

largest communities in the area have all been recently allocated construction grant monies. This will be discussed in greater detail in Section III, Water Quality.

There is relatively little water using industrial activity in the planning area, as the greater Portland area is primarily a commercial and banking center. There are only two major water using industries in the area, S.D. Warren in Westbrook, a large pulp and paper complex, and Central Maine Power's Wyman Station on Cousins Island in Yarmouth, a thermal electrical generating station. The latter facility has three existing generators with a large fourth unit under construction. The wastes from these sources and all other major sources will be discussed later in the report. Oil handling and storage is also a major industrial activity of the region, particularly in the inner Portland Harbor area. Minor industrial activities are centered around fish and food processing in Yarmouth, Portland, South Portland, and Scarborough; metal fabrication, chemicals and rendering in other areas.

The water quality problems of the area are quite varied, and include non-point sources of wastes along the numerous lake shores and coastal areas as well as point sources of private, municipal, and industrial wastes along the rivers and coast line. The major problems stem from oil and untreated municipal wastewaters in the harbor area and Back Cove and inadequately treated industrial wastes in the Lower Presumpscot River and estuary.

C. Previous Water Quality Planning

The planning area, whether considered in part or as a whole, has been the topic of numerous planning reports on water quality and waste management activities. The most recent regional study was the Greater Portland Regional Sewerage System, prepared in 1971 for the Portland Water District by Metcalf & Eddy of Boston. This

study assessed the waste treatment alternatives for Portland, South Portland, Westbrook, including S.D. Warren, Cape Elizabeth, Cumberland, Falmouth, Gorham, Standish, and Windham. The study, funded in part by the DEP, is the basis for many of the facilities which are planned for construction in the near future. The findings of this report will be discussed in Section III, Water Quality.

The DEP and its predecessors, the Water Improvement Commission (WIC) and Environmental Improvement Commission (EIC), studied the area's water quality on numerous occasions, the results of the most recent work published in the March, 1975 report entitled Presumpscot River Load Allocation for the Portland Water District (Westbrook) Wastewater Treatment Facility. This report concerned itself with the lower Presumpscot River during the annual S.D. Warren mill and river shutdown. The study determined the allowable minimum streamflow required during this shutdown period for the discharge of the proposed Westbrook secondary treatment facility that would maintain the Class C river classification. The report also presented the allowable loadings from the proposed facility if the streamflow was reduced to its minimum.

The Water Improvement Commission, published the Lower Presumpscot River Classification Report in 1966. This report, unlike the 1975 report, dealt with the river when both the S.D. Warren Co. and City of Westbrook are discharging. This report recommended (and later established) that the lower Presumpscot be classified "C", as well as establish load allocations for the attainment of that standard.

The tidewaters of the region were studied by the WIC for the reclassification and classification with the report titled Cumberland County Tidal Basin Water Quality Standards published in 1966.

III. Water Quality

A. Segment Standards and Classifications

The U.S. Environmental Protection Agency (EPA), requires each State to place each water or stream segment into one of two broad categories, Effluent Limitation (EL) or Water Quality (WQ). This categorization is not to be confused with the Maine Water Quality Classification System of A, B-1, B-2, C, and D waters, the actual legal stream standard. The definitions of EL and WQ segments are presented below:

Water Quality Class: Any segment where it is known that water quality does not meet applicable water quality standards, and which is not expected to meet water quality standards, even after the application of the effluent limitations required by Section 301 (b) (1) (A) and 301 (b) (1) (B) of the Act.

Effluent Limitation Class: Any segment where water quality is meeting and will continue to meet applicable water quality standards or where there is adequate demonstration that water quality will meet applicable water quality standards after the application of the effluent limitations required by Sections 301 (b) (1) (A) and 301 (b) (1) (B) of the Act.

The DEP added a third category to take into account the specialized problem associated with eutrophic lakes and ponds where the stream standards may not be in violation of assigned criteria, but some or all normal uses are impaired. This category is called Lake Stress Quality (LSQ). There are twenty LSQ impoundments in Maine at the present time, none of which, however, are located in the Presumpscot-Cumberland Planning Area.

All the waters of the planning area are EL segments with the exception of the following two WQ segments:

Presumpscot River - RM 6.7 (S.D. Warren Paper Co. outfall in Westbrook) to RM 0.0 (the head of tide at Presumpscot Falls in Falmouth)

Back Cove - Portland

The designation as WQ denotes that a waste load allocation is required on the waste sources in the segment since baseline, or what EPA refers to as "best practicable

treatment", may not be sufficient for compliance with legal stream classifications. The waste loads for the above segments are discussed in Part E of this section, Waste Load Allocations. Although only two such designations were made in the area, the DEP update may add to the list as more water quality, biological, or waste load information becomes available.

The classifications of the surface waters of the planning area are described in Appendix II. Class A or SA waters are the highest classification with B-1 and SB-1 the second highest and so on. There are no Class D waters in this planning area.

B. Existing Water Quality

The existing water quality and hydrologic data situation for the waters of the planning area is sparse with only limited amounts of data available for qualification purposes. The DEP has a reasonable amount of data on the entire Presumpscot River, some coastal waters, a number of lakes and ponds, and some small coastal streams. The Portland Water District (PWD) has extensive bacteriological data on Sebago Lake and its tributaries. The Maine Department of Marine Resources (DMR) also has data for much of the coastal areas.

Hydrologic data acquisition has been limited to two permanent U.S. Geological Survey (USGS) streamflow gages in the Royal River Basin, one on the main stem and one on Collyer Brook, and a S.D. Warren Co. gage on the Presumpscot at the Eel Weir Canal. The USGS, in the fall of 1975, installed a permanent streamflow gage on the Presumpscot River at Blackstrap Road as recommended in the Load Allocation Report. Overall, little is known about the area hydrology.

A data acquisition program was started in 1975 and is continuing, through the 1976 sampling season for the area, as part of Section 208 Areawide Waste Treatment Management Planning program in which the DEP has acted as the lead surveillance and

analysis agency. The DEP is coordinating the efforts of USGS, EPA, and the PWD in a water quality and hydrological data gathering effort which includes the Presumpscot River and its tributaries, the Crooked River, the Stroudwater River, the Royal River Basin, tributaries to Long and Sebago Lakes, tidewaters of Scarborough to Falmouth, and some small coastal streams. The purposes of this program are: (1) to gather baseline data at three streamflows, (2) to determine land use - non point source waste relationships, and (3) to verify suspected water quality problems. The entire 208 planning program will be discussed in Section IV, Part B, Areawide Planning.

Recently, the U.S. Geological Survey (USGS) and DEP entered into a cooperative agreement to install a permanent, constant recording water quality monitor on the lower Presumpscot. Installation of this monitor with the present flow gage at the Blackstrap Road site, will provide both qualitative as well as quantitative hydrologic data for optimum management of the river. This monitor will provide a background data base initially, as well as future water quality information to better evaluate in-stream conditions as the industrial and municipal sewage treatment plants go on-line. It is anticipated that the monitor will be fully operational by July 1, 1976 to gather data concurrent with S.D. Warren's mill shutdown (with resultant low flows) during the week of July 4th.

The Greater Portland Council of Governments, Portland Water District, S.D. Warren Co., and Department of Environmental Protection have made provisions for a cooperative agreement with the USGS to annually fund the operations and maintenance costs for the water quality monitor.

Known water quality problems exist and have to some extent been quantified in the areas described below:

1. Presumpscot River - severe degradation below City of Westbrook and S.D. Warren Co., with moderate water quality problems below the South Windham-Little Falls area.
2. Scarborough - many coastal streams and tidewaters polluted because of subsurface waste disposal systems malfunctions and failures.
3. Portland and South Portland tidewaters including Portland Harbor - severely polluted by untreated domestic wastewater discharges and oil handling operations.
4. Tidewaters of Cape Elizabeth, Falmouth, Cumberland, Yarmouth, Freeport, Brunswick and Harpswell - Closed shellfishing areas because of raw discharges of sanitary wastes.

The table on the following page, prepared by the Department of Marine Resources, shows the extent of closed shellfishing areas in the planning area.

The causes of these problems are discussed in the next section, Waste Sources.

C. Waste Sources

The major waste sources within the planning area are for the most part domestic wastewaters, either through municipal collection systems and private lines or through inadequate subsurface disposal systems. There are only two major industrial waste sources, S.D. Warren pulp and paper mill in Westbrook and Central Maine Power's Wyman Station in Yarmouth, a fossil fuel electrical generating unit. The SDW mill's wastewater presently receive partial primary treatment. A secondary facility which should reduce this load considerably has recently been completed and should begin operation soon (now that a suitable sludge disposal site has been approved). The CMP plant presently discharges heated cooling water effluent to Casco Bay with a large additional generating unit under construction. The other industrial discharges are limited to food processors in Scarborough, Portland and Yarmouth and other miscellaneous industries.

The major waste sources will be presented by municipality including the major industrial sources. A summary table will follow containing the source of wastes,

Table 2

CLOSED SHELLFISHING AREAS IN THE
PRESUMPSCOT RIVER BASIN

<u>Town</u>	<u>Total Growing Area (Acres)</u>	<u>Growing Area Closed (Acres)</u>	<u>% Closed</u>	<u>Total Estimated Production Capability (Bushels)</u>	<u>Estimated Production Capability Closed Area (Bushels)</u>	<u>Estimated Retail* Economic Value</u>	<u>% Closed</u>
Brunswick	1,638	176	11	130,325	10,680	\$213,600	8
Harpwell	2,621	175	7	256,825	11,725	\$234,500	5
Freeport	1,491	678	45	203,270	87,300	\$1,746,000	41
Yarmouth	782	59	7.5	123,055	6,300	\$126,000	5
Cumberland	448	63	14	41,845	6,250	\$125,000	11
Falmouth	392	367	94	58,390	57,275	\$1,145,500	98
Portland	385	283	74	23,535	17,585	\$351,700	75
Cape Elizabeth	52	27	52	1,975	1,350	27,000	6
Scarborough	<u>199</u>	<u>189</u>	<u>95</u>	<u>32,275</u>	<u>29,475</u>	<u>\$589,500</u>	<u>91</u>
Total	8,008	2,017	25%	871,195	227,940	\$4,558,800	26

Maine Department of Marine Resources Data prepared for the DEP.

*Based on a current average retail price of \$20.00/bushel

the receiving water, the present and proposed treatment, and the existing and projected waste loads. This summary table is located after Part D, Abatement Activities.

BRIDGTON

Bridgton is located in the northern part of the planning area along the western shores of Long Lake. The village is located along Stevens Brook, a tributary to the lake, into which a number of raw domestic wastewater sources are discharged as well as small individual treatment plant effluents. The 1970 population of Bridgton was 2,967. The seasonal population, however, was estimated by the Maine State Planning Office to be 9,415, a substantial increase. Most of this increase is located along Highland and Long Lakes. The village of North Bridgton adds waste to Long Lake through many direct private discharges (straight pipes) and inadequate subsurface disposal systems.

The Town has been active in waste abatement planning for a number of years with various proposals and alternatives developed. Alternatives have been considered for various configurations of treatment plant siting and interceptor locations for Bridgton, North Bridgton and the Town of Harrison, the neighbor on the northern shore of Long Lake. The latest facilities plan developed under Section 201 of the Federal Water Pollution Control Act Amendments of 1972 (PL 92-500), was completed in December, 1974 by Wright, Pierce, Barnes & Wyman. The plan presented three basic alternatives; (1) tertiary treatment of the village area with a lake discharge, (2) limited collection and secondary treatment, and (3) a subsurface discharge or tertiary treatment with a lake discharge with the limited collection system. These alternatives varied drastically from the 1971 and earlier work by Whitman & Howard who were hired by Bridgton. Wright, Pierce, Barnes & Wyman who were Harrison's engineers, called for as one alternative, collection at Harrison, North Bridgton

and Bridgton with a single tertiary facility in Bridgton. This alternative was later rejected because the high user costs which would have resulted as well as the environmental impact of such a large discharge into Long Lake. It was felt that since the major objective of the abatement program was to eliminate the wastes from the waterways, in particular Long Lake, that a large treatment facility discharge, even with phosphorus removal, would be adding a substantial amount of nutrients.

The 1974 Wright, Pierce, Barnes & Wyman plan estimated the existing waste loadings from the village area as follows:

	<u>Flow (gpd)</u>	<u>BOD (ppd)</u>	<u>Phosphorus (ppd)</u>
Municipal	24,000	40	6.4
Commercial	12,700	21	4.2
Private	3,000	5	0.3
Total	<u>39,700</u>	<u>66</u>	<u>10.9</u>

Because of the relatively small amount of generated wastes, the preliminary report recommended the limited collection system alternative with secondary treatment and land disposal. The final report recommends tertiary treatment; however, a final decision has not been reached. The plan further recommends adequate land use measures to ensure that the non-sewered areas do not cause future water quality problems.

Bridgton received an allocation for a facilities planning grant (Step I) for Fiscal Year 1975. The Town, located in the Portland-Sebago 208 Planning Area, will have the facilities plan reviewed and augmented by the Greater Portland Council of Governments (GPCOG) prior to the final planning stage. GPCOG will participate with Bridgton in a facility plan project that will principally explore land application

of wastewater from the Town. While complexed, this effort will utilize the population, flow and wasteload estimates in the May, 1975 Facilities Plan. It is anticipated that GPCOG will provide a limited amount of money for the effort supplemented by Step I grant monies from EPA.

BRUNSWICK

Brunswick is located in the far eastern part of the planning area between the Androscoggin River and the tidewaters of numerous coastal coves and bays. Because the Town discharges its primary treated wastes to the Androscoggin River estuary, water quality problems will not be discussed in this report but rather in the Androscoggin River Basin Water Quality Management Plan.

CAPE ELIZABETH

Cape Elizabeth, a predominantly residential community, is located on the coast east of Scarborough and South Portland. The Town at present operates two small secondary treatment plants with a third facility operated by the Maine Department of Conservation at the Crescent Beach State Park. The largest of these facilities is the Spurwink Avenue facility which serves an estimated 950 full time residents as well as a school. The plant has a design capacity of 0.27 MGD. The other plant primarily serves a housing development.

The Town was included in the 1971 Metcalf & Eddy study of Greater Portland and has since joined the Portland Water District for waste management activities. The Town also accepted the recommendations of the above plan and has made progress toward implementation. The plan recommended that the northern portion of the Town be collected and pumped to the proposed South Portland secondary treatment facility for treatment. The Cape Elizabeth contribution to that facility would be approximately 10% of the total design load. Both South Portland and Cape Elizabeth were allocated construction grant funds in FY 75, and construction of these systems is presently underway. The remaining portion of the Town would be treated at a new

secondary facility at Alewife Brook. This system would serve the central and southern areas of the Town and would have a design flow of 0.5 MGD. The existing facilities in the Town would be phased out, namely the Hunts Point package plant, the Crescent Beach facility, and the Spurwink Avenue plant. This proposed facility does not have as high a statewide priority as the northern system and construction may not occur for three or more years, depending upon Federal construction grant funding levels.

Both proposed systems will eliminate many of the existing problems associated with inadequate subsurface disposal systems that occur throughout the Town.

CASCO

Casco is a small town located on the eastern shores of Sebago Lake. The Town contains no collection system of any kind and is not expected to require such. The wastes generated from Casco would be of the non-point source type, generally from the shoreland developments along the many water bodies within the Town.

Casco is part of the Portland-Sebago 208 planning area.

CUMBERLAND

Cumberland is located on Casco Bay between Falmouth and Yarmouth. The Town is rural in nature and contains no municipal collection system. The water quality problems stem from inadequate subsurface systems and direct private discharges in the Foreside area and on the islands. The problems of the Cumberland Center area are not as severe as those along Casco Bay, but collection of wastewater from both areas for treatment at the existing Falmouth secondary facility was recommended in the 1971 Metcalf & Eddy report. The E.C. Jordan Co. in December, 1975 submitted to Cumberland, the final design and specifications for these facilities. The Town Council has accepted the design and directed the Sewer Study Committee to explore necessary arrangements with Falmouth.

The Town joined the Portland Water District (PWD) for management of its waste abatement program. Cumberland, a lesser overall statewide priority, is not expected to receive an actual construction grant for a number of years.

FALMOUTH

The Town of Falmouth has a secondary treatment facility serving approximately 3,500 people and a number of commercial establishments. The facility serves the Foreside, Mackworth Point and other areas with proposed extensions to serve outlying areas and Cumberland Foreside and possibly Cumberland Center. The facility discharges into the Presumpscot River estuary. This facility recently (May, 1976) received an award from EPA gaining recognition as one of the outstanding municipal sewage treatment plants in New England. The EPA award stated that the plant had consistently obtained 95% removal of BOD and suspended solids.

Falmouth is presently not a member of the Portland Water District, but owns and operates their treatment facility independently. Their bonding arrangements provide for an option in 1978, whether to continue with the present operation or join the Portland Water District for management and operation of its waste abatement program. The Town Council is currently investigating possibilities to present to the Town for a vote.

FREEPORT

The Town of Freeport is located on Casco Bay between Yarmouth and Brunswick. There are a few developed areas of the Town, most notably the village area and South Freeport. A collection system and primary treatment facility presently serves the village area with a Frost Gully Brook discharge. This system was determined inadequate as the Class A brook was becoming severely degraded. In addition, the South Freeport and adjoining coastal areas were experiencing waste disposal problems and a new system for the entire Town was planned.

The Freeport Sewer District, after preliminary and subsequent final planning, is constructing a secondary treatment facility in South Freeport which will serve all the built-up areas of Town. Collection systems will be included in the project for the coastal areas of South Freeport. The existing treatment facility will be phased out and replaced by a pumping station. The proposed facility will discharge approximately 0.5 MGD of treated wastewater to Harraseeket River, at the Cushing Briggs Road site.

Freeport is part of the Greater Portland Council of Governments (GPCOG) 208 planning area.

GORHAM

The Town of Gorham has two small collection systems, one at the Little Falls Village on the Presumpscot River across from South Windham and the other at the University of Maine Gorham campus. The latter system is served by a secondary treatment plant, with an effluent polishing sand filter, which discharges to Tannery Brook. The brook is a tributary of Little River which is a major Presumpscot tributary.

The Village area which is presently non-sewered experiences subsurface disposal problems. The 1971 Metcalf & Eddy plan recommended full collection at both the University and Little Falls including South Windham for interception to the proposed Westbrook facility with ultimate discharge to the Presumpscot River. Gorham, with the exception of Gorham Village, will have a facilities plan developed during Fiscal Year 1976 as part of the 208 program for the area. The plan will consider service areas, the fate of the existing facility, and other abatement alternatives.

Gorham also joined the PWD for waste abatement.

GRAY

Gray is a small fast growing town located approximately half way between the Port-

land and Lewiston metropolitan areas. The Town does not contain any wastewater collection system and is not considered a high priority for abatement activity. A preliminary engineering report for the Town was prepared in 1968 by E.C. Jordan which recommended collection and secondary treatment with a discharge to the Royal River. This plan will be reassessed as part of the 208 planning program although a facilities plan is too premature at this time.

Non-point source problems occur within the Town along the heavily developed shores of Little Sebago Lake, Dry Pond and Forest Lake. Little Sebago has experienced the most notable impact of man's activities, with widespread development throughout its perimeter.

HARPSWELL

Harpswell is a coastal community located on several peninsulas in the far north-eastern corner of Cumberland County and located within the Southern Midcoast Regional Planning Commission's planning area. The Maine State Planning Office estimates show a 1973 population of 2,874, scattered along two peninsulas and two major islands. The Town has had no preliminary engineering studies conducted to date, and has not to date received points on the Municipal Priority Point System. The DEP October 1, 1976 deadline for Best Practicable Treatment should eliminate many of the problems caused by previous "straight pipe" discharges from private summer and year-round homes.

HARRISON

Located at the northern shore of Long Lake, Harrison like Bridgton experiences a large summer population increase. The Town contains direct discharges of wastewaters in addition to suspected non-point sources of wastes from malfunctioning subsurface disposal systems around Long and Crystal Lakes.

A 1971 preliminary engineering report prepared for Harrison by Wright, Pierce, Barnes & Wyman recommended collection of the village area and treatment at Bridgton via an interceptor along Long Lake. As discussed in the Bridgton section, this alternative was unacceptable due to the resulting high user costs and possible adverse impact of the large tertiary effluent on Long Lake.

The situation now facing Harrison is to correct the present subsurface disposal problems on an individual basis, with proper code and site development enforcement in the future for new home construction. Harrison presently does not have any zoning or subdivision regulations, a matter which will be investigated in the 208 planning program. The GPCOG is investigating the feasibility of various alternatives without eliminating the option of a municipal system.

NAPLES

The Town of Naples borders the shores of Long Lake, the Bay of Naples and the northern shores of Sebago Lake. Naples does not have any wastewater collection system and does not contain any known point sources. The village area is located at the southern end of Long Lake with other settlements located at South Naples and Thomas Point on Sebago Lake. The high summer population increases along the Naples shorelines are suspected of causing non-point sources of wastes, again, from faulty septic systems.

Future waste management in Naples should focus on code enforcement and land use controls to ensure that the high lake quality will not be impaired. Naples is part of the 208 planning area and will therefore be looked upon in this light.

NORTH YARMOUTH

The Town of North Yarmouth does not contain any wastewater collection system as the population is not concentrated in any one portion of the Town. The Town handles its wastewater through individual subsurface disposal and it does not appear that

collection and treatment will be warranted.

North Yarmouth is included in the GPCOG 208 planning program and will be studied to determine its future waste management needs.

OTISFIELD

Otisfield is located in the northeastern part of the planning area and is situated along the divide of the Presumpscot and Androscoggin River Basins. There are no known point sources of wastes within the Town.

Otisfield, although not part of the Portland or Androscoggin Valley 208 planning programs, will have its Presumpscot drainage area land studied for water quality and waste management activities by the Greater Portland Council of Governments 208 study.

PORTLAND

Portland, Maine's largest city, presently discharges 10 MGD of predominantly domestic wastewaters into the Fore and Stroudwater Rivers, Back Cove and Casco Bay. This flow includes an estimated 2 MGD of wastewater from food and fish processors, cooling water and sanitary wastes from industry.

The City operates a small secondary package plant which serves an industrial park area. This facility, which discharges to the Stroudwater River, will eventually be phased out with interception to the proposed large facility off the Eastern Promenade. Portland was allocated Fiscal 1976 funds to construct the treatment plant and outfall and a large portion of the interceptors and pump stations. These facilities will be constructed and operated by the Portland Water District.

The proposed facility will also serve portions of South and West Falmouth in the future. This facility will be the largest publicly owned facility in Maine and is planned to serve approximately 76,000 people by 1995.

The completion of the facility and all of the planned interceptors in conjunction with the completion of South Portland's facility will greatly improve the water quality of the inner Portland Harbor and Back Cove. The major problems facing these areas will be the combined sewer overflows, urban storm drainage and the oil pollution and potential major spills associated with the oil pipeline and storage activities. In addition, plans still exist for an additional pipeline to Sanford for a refinery. This refinery, although presently not viable, may still be a factor in the coming years. These problems will be considered in the 208 planning program.

PORTLAND ISLANDS

A unique and certainly significant region within the Basin planning area are the islands of the City of Portland. The major islands are Peaks, Cong, Great Diamond, Little Diamond, Cushing, and Cliff, as well as other smaller islands with little or no population. Population figures in Table 1 , page 5 , for the City of Portland, reflect values for the Casco Bay Islands. Calculations by the GPCOG (pending review and subject to revision) for 1975 estimate a year-round population of 1,250 residents, with a peak seasonal population of 5,000 inhabitants. Although there is no industrial or agricultural activities located on the islands, septage wastes generated are a significant problem. Straight pipe discharges predominate, with Peaks Island being the only island with a public sewer system. Also, one open burning dump on Peaks, as well as sanitary landfills on Long and Diamond Islands are potential non-point sources of pollution.

The GPCOG is coordinating a Facilities Planning contract for the Islands, to include an inflow/infiltration study on existing sewers on Peaks Island. This feasibility analysis will investigate collection and treatment systems, as well as the unique sludge transportation and disposal problem.

POWNAI

The small Town of Pownal is located north of Freeport and Yarmouth. There are no municipal collection systems in the Town. The Town is rural in nature and is not expected to require treatment facilities although the 208 planning process will investigate this possibility. Pownal has experienced very slow growth in the past which would indicate that the need for facilities planning in the near future would not be necessary.

RAYMOND

Raymond is a small town located along Jordan Bay of Sebago Lake. Crescent Pond, Thomas Pond, Panther Pond, and Little Rattlesnake Pond (Raymond Lake) as well as Sebago Lake are relatively heavily developed with seasonal homes and commercial establishments.

There are no known point sources of wastes within the Town although the above shore-land development is suspected of generating a substantial quantity of non-point wastes to the waterways. Raymond is part of the 208 planning area and will have these problems evaluated.

SCARBOROUGH

Scarborough is a fast growing town in the southern part of the planning area. The Town's waste problems are of both the point and non-point sources. A wastewater collection system and secondary treatment facility serves the Oak Hill area with the other areas relying on subsurface waste disposal. The latter has resulted in the closing of many acres of clam flats within the many estuaries of Scarborough.

Scarborough was allocated Fiscal 1976 construction grant funds to prepare final plans for a major collection and treatment system to serve all of the built up portions of the Town. The proposed system was the result of many years of preliminary planning on a number of alternatives. This latest proposal calls for the collec-

tion of the wastewaters from the built up portions of Higgins Beach, Prouts Neck, Pine Point and Pleasant Hill including the existing system at Oak Hill which will have the treatment facility phased out. A single facility and ocean discharge will be located at Prouts Neck. The existing facility discharges to the Nonesuch River and treats approximately 0.2 MGD of industrial, commercial, and residential wastes. The Scarborough Sanitary District is the managing agency for the Town.

The proposed facility is not universally accepted by the Town's population as the best alternative. One of the most contested topics is the ocean outfall located off Prouts Neck. The U.S. Environmental Protection Agency recently drafted an environmental assessment and impact statement on the system hopefully to deal with the controversy surrounding the proposed system. However, due to continued opposition at public hearings as well as EPA's desire to have the preliminary draft revised, a final draft is pending.

Scarborough has been under order by the DEP to abate its pollution problems for a number of years. With its rapid growth potential, Scarborough, must carefully consider the problems of new collection systems - generated growth as well as urban runoff from newly developed areas which may be great enough to prevent shellfishing areas from opening. The 208 planning program will assess these issues.

Two food processors are located in Scarborough, Humpty Dumpty Potato Chip and Snows Food, a seafood canner. The former is connected to the Oak Hill secondary facility whereas the latter plant at Pine Point will connect to the municipal system. The Snows Food processor produces approximately 103,000 gpd of wastewater, of which 300 gpd are sanitary and the remainder processing wastes. The present BOD₅ generated is approximately 2000 pounds per day (ppd) with 300 ppd proposed after treatment. Snow's had the option of joining the proposed municipal system and elected to, rather than operating their own waste treatment system. The Humpty Dumpty plant constitutes approximately 18% of the Scarborough Sanitary District facility.

SEBAGO

The Town of Sebago is located along the northwestern shores of Sebago Lake. Two of the largest built up portions of the Town, East Sebago and North Sebago are located on the shores of the lake.

There are no known point sources of wastes within the Town although the heavy concentrations of shoreland development probably generates a significant amount of non-point sources of wastes. Sebago, like the other communities around Sebago Lake, will have this and other waste management problems studied under the 208 planning program.

SOUTH PORTLAND

The City of South Portland, the second largest community in the planning area, discharges approximately 4 MGD of predominately raw domestic wastewaters to the Fore River and Casco Bay. The present collection system serves approximately 22,000 of the total 23,267 population (1970) with projected connections for 35,000 by 1990. The latter figure includes the projected 4500 people connected by the North Cape Elizabeth system of pumping stations and interceptors.

South Portland was allocated construction funds in Fiscal 1975 and construction was started in November, 1975. The North Cape Elizabeth system was also allocated Fiscal 1975 funds and construction began within calendar year 1975 for that project.

The proposed system will discharge to the Fore River and will be managed by the City of South Portland. The City decided not to join the Portland Water District system although the proposed physical system is the same basic concept as that recommended by the Metcalf & Eddy study. Cape Elizabeth did join the PWD.

As with the Portland system, urban runoff, combined sewer overflows, and oil pollution will continue to be a water quality issue along the Fore River and Casco Bay

areas. The GPCOG will take an intense look at urban runoff and combined sewer overflows, however, a preliminary assessment of the problems and impact of oil handling and storage will be evaluated in a general way.

STANDISH

The Town of Standish is located between Sebago Lake and the Saco River. The Town has by far the largest length of shoreland of Sebago Lake. Frye Island, the largest island in the lake is part of the Town of Standish, although access to it is usually through Raymond. There are no municipal collection systems within the Town although there are several built up areas. These include Steep Falls on the Saco, Standish Center on the North Branch of Little River, Sebago Lake Village on the lake, and North Standish on the western shores of Sebago Lake Basin.

There are no immediate plans to construct facilities in the Town although known areas of non-point sources exist, especially in Sebago Lake Village. The Metcalf & Eddy plan recommended for future consideration, construction of collection and treatment facilities for a few areas in the Town. These include a small collection system and treatment facility at Steep Falls, collection and treatment at Standish Center and collection at North Standish and Frye Island for treatment at North Windham. These systems have low overall statewide priorities although the 208 planning program will re-evaluate and update the needs and alternatives. Standish did not enter the GPCOG 208 program, as the selectmen elected not to sign the resolution agreeing to join. Recent Federal decisions to conduct Statewide 208 planning indicate that some planning by the GPCOG will be accomplished.

WESTBROOK

The City of Westbrook, the third largest community in the planning area, is located along the Presumpscot and Stroudwater Rivers. The City discharges approximately 1.5 MGD of raw domestic wastes generated by a population of 12,000 into the Pre-

sumpscot River as well as a small secondary effluent from a development downstream of the urban area.

Westbrook has been allocated Fiscal 1976 construction funds and groundbreaking for this facility occurred in June, 1976. The proposed system will serve an estimated 30,000 people by 1990 including connections from Gorham Village, South Windham, and Little Falls. Westbrook voted to join the Portland Water District for its waste management.

S.D. Warren, a Division of Scott Paper, is located in Westbrook and also discharges into the Presumpscot River. Although secondary treatment facilities are presently under construction, 21 MGD of pulp and paper wastes are discharged with only 7 MGD of paper wastes receiving primary treatment. S.D. Warren is the largest single waste source in the planning area and in all of coastal southern Maine. The mill has the following average daily discharge conditions as licensed by the DEP and the U.S. Environmental Protection Agency:

Until October 1, 1976

37,200 ppd BOD₅

99,300 ppd S.S.

After October 1, 1976

7300 ppd BOD₅

7000 ppd S.S.

The construction is on schedule and the facilities will be operating by October of 1976. The operation of this facility will result in greatly improved water quality in the lower Presumpscot River and estuary.

Problems that will not be fully resolved by the construction of the above two facilities are: 1) the benthic, or sediment oxygen demand in the lower river through years of untreated pulp and paper discharges, 2) urban runoff and combined overflow discharges from the proposed Westbrook system, and 3) the river shutdown by S.D. Warren during the annual mill shutdown of July 4th.

The latter problem was tentatively resolved by S.D. Warren agreeing to maintain 50 cfs streamflow in the Presumpscot River at the proposed Westbrook discharge during their shutdown. This figure was determined to be adequate for the initial design loadings of the proposed facility. The benthic problem is expected to reduce in magnitude as the treatment facilities become operable. It is not clear when the problem will be reduced significantly in the estuary or river, but the impact was taken into account in the analysis of required minimum streamflow. The urban runoff and related problems will be studied in the 208 planning program.

The load allocation section deals specifically with the streamflow problem in the Presumpscot River during the S.D. Warren mill shutdown.

WINDHAM

The Town of Windham is located in the central portion of the planning area and occupies a small section of Sebago Lake shoreline. In addition to Sebago Lake, Little Sebago, Forest and Highland Lakes and Pettingill Pond are major water bodies within the Town which experience high density shoreland development. The Town has a number of built up areas including South Windham on the Presumpscot River, North Windham near Sebago Lake Basin and Windham Center. There are no municipal collection systems in the Town although two small secondary facilities serving the Windham schools and the Department of Mental Health and Corrections Reformatory discharge small effluents to the Pleasant River and the Presumpscot River, respectively.

The Metcalf & Eddy report recommended collection and treatment at North Windham with a Presumpscot River discharge for North Windham, North Standish and Frye Island. In addition, the report further recommended collection at South Windham and Little Falls for treatment at Westbrook. Collection of the Little Sebago Lake and Highland Lake shorelands was also included. Windham joined the Portland Water District system.

The 208 planning program will evaluate the waste management needs of Windham in relationship to Gorham and Westbrook.

YARMOUTH

The Town of Yarmouth is located north of Falmouth and Cumberland on Casco Bay and along the Royal and Cousins Rivers. The Village area is presently served by a collection system and a secondary treatment plant with a Royal River estuary discharge of 0.2 MGD. The facility presently serves approximately 2,300 people and is expected to serve 4,300 by 1990. Old Tavern Farm dairy is a major connector to this system, generating approximately 10% of the total wastewater.

Yarmouth is included in the 208 planning program and will have its future needs studied.

CMP operates a thermal electric generating station on Cousins Island with a cooling water discharge into Casco Bay. A large fourth generator is planned for the near future which will substantially increase their discharge. The major CMP Wyman Station discharge conditions for cooling water licensed by the DEP and the U.S. Environmental Protection Agency are as follows:

(a) <u>Presently</u>	<u>Average Daily</u>	<u>Maximum Daily</u>
Units 1 & 2	71.3 MGD	95.0 MGD
Unit 3	56.3 MGD	69.1 MGD
Total	<u>127.6 MGD</u>	<u>164.1 MGD</u>

Maximum temperature rise = 35^oF for normal conditions (Units 1 & 2)
 Maximum temperature rise = 36^oF for normal conditions (Unit 3)
 Maximum temperature rise = 120^o-123^oF for abnormal conditions (Units 1, 2 and 3)

(b) After Unit 4 Startup

391 MGD

435 MGD Cooling Water

Maximum temperature rise = 40^oF for normal conditions
 Maximum temperature rise = 120^o-123^oF for abnormal conditions

Royal River Packing Company is also located in Yarmouth. This sardine canning operation discharges an average of 115,000 gpd of wastes to the Royal River estuary. The processor has the following discharge conditions:

Until September 30, 1976

BOD	2877 ppd maximum daily
S.S.	2877 ppd maximum daily
Oil & Grease	961 ppd maximum daily

After October 1, 1976

BOD	1918 ppd ave. daily	2877 ppd maximum daily
S.S.		2877 ppd maximum daily
Oil & Grease		191 ppd maximum daily

After October 1, 1976

(Fish transport wastes from boat to truck)

BOD	Maximum Concentrations - 1200 ppm
S.S.	Maximum Concentrations - 2200 ppm
Oil & Grease	Maximum Concentrations - 50 ppm

Royal River Packing has the option to join the municipal system by October 1, 1976. This would be the most desirable course of action in terms of waste management. At the present time a screen for the flume water has been ordered. Sanitary wastes are treated at the municipal plant, with all other wastes transported for land disposal.

D. Abatement Activities

It is clear from the previous discussions that the planning area waste abatement activity has progressed relatively slowly with only some of the minor waste sources receiving treatment. This will change in the next few years as the major municipal discharges will all be intercepted and treated to a secondary level.

At the present time, the only operating municipal facilities are as follows:

- Scarborough - Oak Hill area, secondary treatment, includes Humpty Dumpty
- Cape Elizabeth - two small secondary units and one primary facility
- Portland - small secondary unit
- Westbrook - small secondary unit
- Falmouth - secondary for most of built-up area
- Yarmouth - secondary for most of built-up area, includes Old Tavern Farms, includes Royal River Packing sanitary wastes
- Freeport - primary for village area
- Gorham - secondary for University of Maine (with effluent polishing)
- Windham - two small secondary units for school and reformatory
- Pownal - small secondary unit at Pineland Hospital (outdated)

The following communities have received or have been allocated construction grants although actual construction has not been started:

- South Portland - FY 75 grant for secondary treatment and interceptors
- Cape Elizabeth - FY 75 grant for interception to South Portland
- Portland - FY 76 grant for secondary treatment and part of total planned interceptors
- Westbrook - FY 76 grant for secondary treatment and interceptors (ground broken June 1, 1976)
- Freeport - FY 75 grant for secondary treatment and interceptors

The major industrial waste sources, as discussed in Part C, are for the most part on their respective compliance schedules.

The following table summarizes all of the waste sources and their characteristics, for the communities in the Basin.

Table 3

PRESUMPSCOT RIVER BASIN - WASTE SOURCES AND TREATMENT STATUS

	Sewered 1970	Population Estimated 1990	Receiving Water/Classification	Wastewater Treatment		Waste Discharge		Remarks	Target date for compliance
				*Existing	*Proposed	1975	1990		
Bridgton	100	600	Stevens Brook/C	0	3	66 ppd BOD ₅ 11 ppd P	3.5 ppd BOD ₅ 1.7 ppd P	Allocated FY 76 Step 2 Grant	?
Brunswick	See Androscoggin River Basin 303 (e) Plan								
Cape Elizabeth	1,200	7,500	Sourwink River/SC Casco Bay/SB-2	0 ^{1,3} See S. Portland	2	240 ppd BOD ₅	104 ppd BOD ₅ See S. Portland	Allocated FY 75 Step 3 Grant for Northern section to connect to South Portland	-
Casco	0	0	-	0	0	-	-		-
Cumberland	400	5,062	Casco Bay/SB-2, SB-1, SA	0 See Falmouth	2	80 ppd BOD ₅	See Falmouth	Proposed regional connection with Falmouth	?
Falmouth	3,500	7,600	Presumpscot River Estuary/SC	2	2	70 ppd BOD ₅	152 ppd BOD ₅		Secondary operating
Freeport	1,600	5,000	Frost Gully Brook/A Harraseeket River/SB-2 (proposed)	1	2	250 ppd BOD ₅	125 ppd BOD ₅	Allocated FY 75 Step 3 Grant existing primarily to be phased out	UC
Gorham	2,870	2,776	Presumpscot River/C (Proposed)	0 See Westbrook	2	200 ppd BOD ₅	See Westbrook	Proposed connection to Westbrook for Village and Steep Falls	?
University of Maine	-	-	Tannery Brook/B-2	3	0	40 ppd BOD ₅	-	Existing system to be phased out	?
Gray	0	3,800 ²	-	0	2 ²	-	-		?
Harswell	See Coastal Basin 303 (e) Plan								-
Harrison	0	940 ²	-	0	3 ²	-	-	See Bridgton and Harrison discussions	?
Haples	0	0	-	0	0	-	-		?
North Yarmouth	0	0	-	0	0	-	-		?
Ottsfield	0	0	-	0	0	-	-		?

Table 3 (Continued)

PRESUMPSCOT RIVER BASIN - WASTE SOURCES AND AVERAGE STATUS

	Sewered 1970	Population Estimated 1990	Receiving Water/Classification	Wastewater Treatment		Waste Discharge		Remarks	Target date for compliance
				*Existing	*Proposed	1975	1990		
Portland	65,000	78,000	Casco Bay/SC Stroudwater River/SC Back Cove/SC	0 ¹	2	17,000 ppd BOD ₅	2,400 ppd BOD ₅	Allocated FY 76 Step 3 Grant for most of proposed system. Includes many small industries	Bid 3/76
Pownal	0	0	-	0	0	-	-	-	-
Pineiland	-	-	Royal River/C	2	2	85 ppd BOD ₅	85 ppd BOD ₅	-	-
Raymond	0	0	-	0	0	-	-	-	-
Scarborough	2,000	24,000	Nonesuch River/SC Atlantic Ocean/SB-1 (Proposed)	2	2	40 ppd BOD ₅	480 ppd BOD ₅	Allocated FY 76 Step 2 Grant. Existing facility to be phased out	-
Snows	-	-	Jones Stream/SB-2	0	2	2,000 ppd BOD ₅	360 ppd BOD ₅	May join municipal system	Secondary opera:
Humpy Dumpty	-	-	Included in municipal system	-	-	-	-	Connected in municipal system	-
Sabago	0	0	-	0	0	-	-	-	-
South Portland	23,000	35,000	Fore River/SC	0	2	5,000 ppd BOD ₅	1,000 ppd BOD ₅	Allocated FY 75 Step 3 Grant. Will include Northern Cape Elizabeth	4/78
Standish	0	0	-	0	0	-	-	-	-
Westbrook	12,000	30,000	Presumpsco River/C	0 ¹	2	2,400 ppd BOD ₅	600 ppd BOD ₅	Allocated FY 76 Step 3 Grant. May include Gorham Village, Steep Falls, and South Windham	Bid 2/76
S.D. Warren	-	-	Presumpsco River/C	1	2	37,200 ppd BOD ₅	7,300 ppd BOD ₅	South Windham may go to Westbrook	10-76
Windham	0 ³	5,300	-	0 ³	2	-	See Westbrook	-	-
Yarmouth	2,300	4,300	Royal River Estuary/SB-2	2	2	46 ppd BOD ₅	86 ppd BOD ₅	Includes Old Tavern Farms Dairy	-
Royal River	-	-	Royal River Estuary/SB-2	See	Yarmouth discussion	-	-	May join municipal system	-
CHP	-	-	Casco Bay/SB-2	See	Yarmouth discussion	-	-	See Yarmouth discussions	-

* 1. Small municipal facilities operating for limited service areas.
 2. Proposed by preliminary studies, will be re-assessed.
 3. Small institutional facilities operating within municipality.

*Note: 0 - No treatment
 1 - Primary treatment
 2 - Secondary treatment
 3 - Tertiary treatment
 UC - Under construction

E. Waste Load Allocations

As discussed in Part A, Segment Standards and Classifications, two Water Quality (WQ) Segments were designated in the planning area, Back Cove in Portland and the lower Presumpscot River below the built-up section of Westbrook to the head of tide in Falmouth. These segments have been so classified since treatment levels beyond baseline, or 'best practicable treatment' may be required to bring water quality up to its legal classification. These would be "SC" for Back Cove and "C" for the lower Presumpscot.

The problems associated with Back Cove are as follows:

- low dissolved oxygen
- solids deposition
- high bacterial contamination
- general unaesthetic conditions

The cause of this problem is the raw wastewater discharges from the City of Portland. The proposed waste management program for Portland will intercept all of the dry weather flows and a fraction of certain storm flows, but it is expected that a large amount of combined wastes in addition to the urban runoff will still plague the water quality of Back Cove for years to come. The 208 planning program will assess this problem in light of the economics of storm water corrective action and projected water quality improvement benefits, such as shellfishing.

The DEP did not develop a load allocation for Back Cove due to the unresolved problem of the urban runoff and combined overflows. A load allocation was, however, developed for the Presumpscot River. The problems associated with this WQ segment are as follows:

- low dissolved oxygen

high turbidity
floating solids
benthic, or sediment oxygen demand
bacterial contamination
general unaesthetic conditions

The chief causes of the above conditions are the years of untreated pulp and paper discharges from S.D. Warren, Inc. and to a lesser extent from the Westbrook raw municipal discharges. The wastewaters from both sources will be treated to secondary or equivalent levels in the next two years, with the S.D. Warren facility to go into operation in 1976 and the municipal facility planned for a 1977 completion. The abatement of these sources will improve the water quality below Westbrook including the estuary, however, it will take many years to flush out sediment deposits.

As stated in the Westbrook discussion in Part C, however, there still remains the problems of the combined sewers in Westbrook, the urban runoff, and the annual Presumpscot River shutdown as part of their annual July 4th week vacation and mill shutdown. The former problems will be investigated as part of the 208 planning process being developed for the area. The latter was the topic of a special DEP investigation and subsequent report titled, Presumpscot River Load Allocation for the Proposed Portland Water District (Westbrook) Wastewater Treatment Facility, March 1975. The major findings and recommendations of the above report are presented below. They were made based upon the determination that 25 cfs is the minimum streamflow attainable with this flow coming from dam leakage and tributary flow.

Study Conclusions:

1. The sediment oxygen demand (SOD) of the lower Presumpscot is so great that no discharge should be allowed into the river at 25 cfs.

2. A discharge of 250 ppd BOD will require a streamflow of 50 cfs to maintain 5.0 mg/l DO,

A discharge of 450 ppd BOD will require a streamflow of 55 cfs to maintain 5.0 mg/l DO, and

A discharge of 750 ppd BOD will require a streamflow of 70 cfs to maintain 5.0 mg/l DO.

3. The velocities of the lower Presumpscot River at 25 cfs are much lower than had previously been expected.

4. Subsequently, the critical sag in the DO at 25 cfs occurs between RM 2.0 and RM 1.0, downstream from Blackstrap Road in Falmouth, not at RM 0.0 (Smelt Hill Dam), where it had been initially calculated.

5. Additional water quality analysis of the Presumpscot River in the next two summers will probably not result in a load allocation much different from the above. Any further data acquisition should be aimed at gaging the river near the Smelt Hill Dam and gathering physical data on the lower reaches.

Study Recommendations:

1. S.D. Warren should initially pass at least 25 cfs (16.1 MGD) additional streamflow to the base flow of approximately 25 cfs through its series of dams to maintain a minimum streamflow of 50 cfs at Cumberland Mills, RM 6.9, at all times during their annual mill shutdown period. This 50 cfs will allow the full discharge from the City of Westbrook's proposed secondary treatment facility into the Presumpscot River without violating the 5.0 mg/l DO standard.

2. A permanent streamflow recording gage should be established at or near the Smelt Hill Dam, RM 0.0.

3. Provisions should be made at the above site for continuing DO, pH, Temperature, and Conductivity measuring and recording devices. This water quality data gathering should be employed initially during the shutdown period and continuously after both S.D. Warren and the City of Westbrook are discharging.

4. The results of the above streamflow and water quality data gathering will be used by DEP in determining future load allocations and/or streamflow requirements for later years when the Westbrook facility receives its projected increased design loadings. The data will also be used to determine the extent of SOD reductions once the S.D. Warren secondary facility has been operating for a sufficient period of time.

5. In lieu of the above data, 70 cfs is tentatively projected for a required minimum streamflow at Cumberland Mills to maintain 5.0 mg/l DO during the S.D. Warren shutdown period at the full design loading of the proposed Westbrook facility.

6. In addition, until such data becomes available, it would be desirable to maintain a minimum streamflow of 300 cfs at Cumberland Mills when both Westbrook and S.D. Warren are discharging, with an absolute minimum requirement of 250 cfs, barring extreme dry periods.

Since the publication of the report, S.D. Warren has agreed to allow the additional streamflow pass through their dams during the shutdown period as recommended in Point 1. Also, the Geological Survey of the Department of the Interior (USGS) has installed a permanent streamflow gage at Blackstrap Road as recommended in Point 2. This will be part of the 208 planning program for the area which was initiated in July, 1975. This planning effort is discussed in greater detail in the next section. Recommendation 3 above, the provisions for continuing water quality monitoring at the streamflow gage site has also been resolved with the DEP and USGS funding the installation of a device in the near future. As mentioned previously, S.D. Warren, Portland Water District, and the Greater Portland Council of Governments have committed themselves to a share of the operation and maintenance funds for the operation of the streamflow and water quality monitoring devices.

As stated in the conclusions and recommendations, the DEP will re-assess this allocation once additional data becomes available.

F. Lake Water Quality

Water quality of the more than 100 Great Ponds contained within the Presumpscot River Basin ranges from the extremely high quality found in Sebago Lake to the eutrophic conditions of Nubble Pond in East Raymond. A reduction in quality generally follows a trend in seasonal use and development. Existing water quality data on these 104 Great Ponds is limited. Detailed water quality and morphometric data for eight (8) lakes (listed below) in the Basin is presently being collected and analyzed as part of an on-going three year U.S. Geological Survey - DEP Cooperative Limnological Study. An open file report was published in October, 1975, the first of three annual reports prior to the final documentation to be completed

in 1977. The eight study lakes are:

Coffee Pond

Highland Lake

Crescent Lake

Nubble Pond

Crystal Lake

Panther Pond

Forest Lake

Raymond Pond

Additional water quality information was published by the EPA in May, 1974 on Sebago and Long Lakes. This study was initiated in 1972 as part of a National Eutrophication Survey of freshwater lakes and reservoirs. Sebago Lake has also been extensively sampled by the Portland Water District. According to the Maine Lake Water Quality Strategy - 1975, prepared by the DEP Division of Lakes and Biological Studies, there are no Lake Stress Quality (LSQ) impoundments within the Basin.

Also within the Presumpscot River Basin, a detailed study of Coffee Pond/Forest Lake is presently being conducted for the DEP by E.C. Jordan Co. of Portland. The study will provide lake shed management plans specifically for Coffee Pond/Forest Lake, but it is also a pilot program to develop a lake shed and water quality management program applicable to other Maine lakes. Presently, interim outputs have been published, with the final study report to be completed in the Spring of 1976.

IV. Planning Activities

A. Facilities Planning

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) requires facilities planning prior to the awarding of construction grants for municipal wastewater treatment facilities. Section 201 of the 1972 Amendments provides a three step plan for municipal facilities. Step One plans are preliminary engineering reports, Step Two being final plans and specifications, with Step Three as the actual construction grant itself.

Section 201 facilities planning was established to ensure that communities investigate all possible alternatives in its waste abatement program as to cost-effectiveness, social and environmental compatibility, as well as interfacing with both State and Federal goals and requirements.

The Maine DEP is responsible for setting the priorities for 201 planning, and has established a priority point system assigning a number value to communities and districts throughout the State. The following table lists priority points for communities and districts in the Presumpscot River Basin. A discussion of the system and Statewide listing is appended.

<u>Municipality</u>	<u>Priority Points</u>	<u>Remarks</u>
Portland (Portland Water Dist.)	23	Step 3 12/75
Scarborough S.D.	23	Step 2 1/75
Westbrook (P.W.D.)	23	Step 3 12/75
Bridgton	22	Step 2 5/75
Cape Elizabeth (North-P.W.D.)	22	Step 3 9/75
Freeport S.D.	22	Step 3 6/75
South Portland	22	Step 3 9/75
Cape Elizabeth (South - P.W.D.)	17	Awaiting Step 1
Cumberland	16	Awaiting Step 1
*Gorham (Little Falls-P.W.D.)	16	Awaiting Step 1
*Gorham (P.W.D.)	14	Awaiting Step 1
*North Windham (P.W.D.)	13	Awaiting Step 1

*These smaller communities which could benefit from regionalization will develop their plans under the Section "208" planning program.

B. Areawide Planning

Section 208 of the 1972 Amendments to the Federal Water Pollution Control Act made provisions for the Governor of a state to designate certain areas which were experiencing severe water quality problems. Then Governor Kenneth M. Curtis designated 5 regions within the State eligible to receive 100% funding for a two-year comprehensive planning effort. The Greater Portland Council of Governments (GPCOG) was awarded "208" funds to conduct Areawide Waste Treatment Management Planning for the Portland-Presumpscot area. The following communities are incorporated in the GPCOG "208" area:

Bridgton	North Yarmouth
Cape Elizabeth	Portland
Casco	Pownal
Cumberland	Raymond
Falmouth	Scarborough
Freeport	Sebago
Gorham	South Portland
Gray	Westbrook
Harrison	Windham
Naples	Yarmouth

The objectives of the planning effort will result in a plan for managing both point and non-point sources of water pollution. The benefits will be swimmable and fishable waters by 1983 (wherever attainable) and preservation of the present high quality waters, especially Sebago Lake. The GPCOG will be working with State and Federal water quality management agencies and officials to set the goals for the planning process. Because of the rural nature of the upper portion of the watershed, non-point source pollution control will be the major control mechanism to prevent degradation in this area. Recent court decisions have dictated that

208 planning be conducted for all areas of the U.S. The Towns of Standish and Otisfield which are presently not incorporated in the GPCOG 208 area, will be looked at by the GPCOG to satisfy this mandate. However, funding levels are minimal, as will be the level of detail of planning.

C. Plan Update

The Presumpscot River Basin Water Quality Management Plan will be updated as additional water quality information is collected, especially after wastewater treatment facilities planned, or under construction become operable. Similarly, waste load allocations will be revised as abatement facilities go on-line. This document is considered Phase I Basin Planning with the completion and approval of Phase II Basin Plans by November 1, 1978. Phase II Basin Planning will reflect changes occurring throughout the Basin, updates on facilities, revised population estimates, as well as indicating new techniques and methodologies.

APPENDIX I

DEPARTMENT OF ENVIRONMENTAL PROTECTION
MUNICIPAL PRIORITY POINT SYSTEM

The Department of Environmental Protection as part of its Annual State Strategy has to prepare a Municipal Priority Point System to place proposed construction projects in relative priority that take into account national and Maine problem areas.

The system contains eight (8) basic priorities grouped into three broad categories; serious water quality problems, treaties and statutes, and minor water quality problems.

The first group, serious water quality problems, contains three priorities, Water Supply and Shellfisheries Protection, both with 20 points, and Nuisance with 19 points. The second group has two priorities, U. S. Treaty Obligations with 17 points, and Statutory Time Schedules with 16 points. The last group contains three priorities ranging from 14 to 12 points.

In addition to these eight basic priorities, there are six (6) add-on categories with points values ranging from 10 to 2. These add-on categories are identified as A through F.

This system is used to develop both the one year construction project list and also the Municipal Discharge Inventory list, or long term construction project list.

All eight priorities and the six add-ons are discussed in detail below:

BASE POINTS

Priority 1 Water Supply Protection 20 Points

The project to be funded will eliminate a source of water supply contamination. This priority denotes that a potential public health hazard does exist and that without such project, alternative sources of water would be required or additional water treatment would be necessary.

Priority 2 Shellfisheries Protection 20 Points

This priority denotes that the project will eliminate a source of shellfisheries contamination. The project will eliminate sources of waste that are partially or wholly responsible for a shellfishery area which is presently closed.

Priority 3 Severe Environmental Nuisance 19 Points

This priority denotes that a serious problem exists in the proposed project area, such as large municipal waste loads discharging into small bodies of water which cause a substantial lowering of the dissolved oxygen content of the waterway, a substantial portion of the project area is on malfunctioning subsurface disposal facilities causing potential severe health hazard or potential economic losses in recreational area because of untreated or inadequately treated sewage wastes.

Priority 4 Treaty Obligations 17 Points

This priority indicates that the project is located in an area covered by the Boundary Waters Act of 1909 which states that both Canada and the U.S. would not dirty the waters of the other country.

Priority 5 Statutory Time Schedule 16 Points

This priority denotes that the project is on a statutory time schedule enacted by the Maine Legislature. These schedules include the Kennebec River, the Penobscot River, Hancock County, Waldo County, the Mousam River, and Section 451 of the Maine Revised Statutes, Annotated. (Hereto referred to as the "451" Schedule).

Priority 6 Misc. Water Quality Problems 14 Points

This priority denotes that the problem is not as severe as those in Priority #3 but will require abatement or corrective action. This priority takes into account local problems such as limited area of project is on malfunctioning subsurface disposal systems.

Priority 7 Necessary to Maintain Water Quality 13 Points

This priority is given to problems which are not creating a nuisance or serious conditions other than violating an assigned water quality standard. This would be applicable to a small discharge located on a relatively large river where bacterial pollution may be a problem.

Priority 8 Upgrading Facility 12 Points

This priority is assigned projects which require additional facility construction. This would be applied to a primary treatment facility being upgraded to secondary, a secondary facility being upgraded to tertiary, or any facility requiring expansion, corrective action, or other renovation.

ADD-ON POINTS

A. Order and Directive 10 Points

A project which has been ordered by a Federal Court, a Maine Court, or the Board of Environmental Protection, will receive ten (10) points in addition to its base point total.

B. EPA Priority Basin 3 Points

A project located in an EPA Priority Basin will receive three additional points. The St. Croix and the Androscoggin River Basins in Maine are EPA Priority Basins at the present time.

C. Located on a Class I Segment 4 Points

Any project located on a Class I Segment as defined by DEP in its Segment Classification System developed pursuant to Title 40 of the Code of Federal Regulations, Part 130.41, (40 CFR 130.41), will receive four (4) additional points.

D. Located on a Class II Segment 3 Points

See C above for definition

E. Location on a Class III Segment 2 Points

See C above for definition.

F. Discharge Effects Lake System

4 Points

If the proposed project discharges into a lake system or tributary thereof, four (4) additional points are added to the Project's priority point total.

A B C D E F

PROJECT LOCATION*

	PRIORITY	BASE POINTS	ORDER AND DIRECTIVE +10	EPA PRIORITY BASIN +3	CLASS I SEGMENT +4	CLASS II SEGMENT +3	CLASS III SEGMENT +2	DISCHARGE EFFECTS LAKE SYSTEM +4	TOTAL MAXIMUM POINTS
1. Water Supply Protection		20							41
2. Shellfisheries Protection		20							41
3. Nuisance		19							40
4. Treaty Obligation (U.S.)		17							38
5. Statutory Time Schedule (Me.)		16							37
6. Misc. Water Quality Problems		14							35
7. Necessary to Maintain Water Quality		13							34
8. Upgrading Facility		12							33
									45

* See DEP Segment Classification

PRIORITY

BASE

ADD-ON

Newport S.D.
Sanford S.D.

5
8

C
C,F

19 Points

Augusta S.D. (WTF)
Bangor (Penobscot Int)
Farmingdale
Frenchville
Gardiner
Hallowell W.D.
Hampden
Howland
Lincoln S.D.
Norridgewock W.D.
Norway
Peru
Randolph
Veazie S.D.
Winterport S.D.

5
5
5
4
5
5
5
5
5
5
8
7
5
5
5

D
D
D
E
D
D
D
D
D
D
B,C
B,D
D
D
D

18 Points

Bethel
Biddeford (Pool)
Bucksport
Clinton W.D.
Dover Foxcroft
Guilford-Sangerville S.D.
Isleboro
Kezar Falls
Stonington
Tremont
Vassalboro S.D.

5
5
5
6
5
5
5
5
5
5
5

B,D
E
E
E
E
E
E
E
E
E

**PRELIMINARY
DRAFT**

DATE _____

17 Points

Cape Elizabeth (Portland W.D.)
Passamaquoddy R.H.A. (Pleasant Pt.)

6
8

D
B,E

16 Points

Brownville
Cumberland
Enfield
Gorham (Little falls)P.W.D.
Kennebunk S.D.
Mars Hill U.D.
Milo W.D.
North Berwick S.D.
Rockport

6
7
7
5
8
8
6
6
6

E
D
D
C
C
E
E
E

PRIORITY

BASE

ADD-ON

15 Points

Bancor (WTF)	8	D
Bayville Village Corp.	7	E
Boothbay	7	E
Cherryfield	7	E
Eastport	7	E
Eliot	7	E
Kingfield	7	E
Kittery	7	E
Anson (North)	7	E
North Haven	7	E
Phillips	7	E
Richmond U.D.	8	D
Squirrel Island Village Corp	7	E
Vinalhaven	7	E
Warren	7	E

14 Points

Ashland W.&S.D.	8	E
Blaine	6	
Boothbay Harbor S.D. (WTF)	8	
Bowdoinham	6	
Canton	6	
Eagle Lake W.&S.D.	6	
Gorham (P.W.D.)	6	
Falmouth (Pleasant Hill)	6	
Harrison	6	
Lewiston (Stabilization Ponds)	8	E
Monson U.D.	6	
Monticello	6	
South Berwick S.D.	8	E

**PRELIMINARY
DRAFT**

DATE _____

13 Points

Danforth	7	
Lubec	7	
New Sharon	7	
Strong	7	
Mattawamkeag	7	

12 Points

Limestone W.&S.D.	8	
Livermore Falls (Clay Bk S.F.)	8	
Ogunquit S.D.	8	

The following Projects are considered to require pollution abatement project.

Buckfield
Burnham
Carmel
Cornish
Denmark
East Machias
Eustis

Fryeburg
Gray
Holden
Madawaska Lake
Orrington
Sherman
Smithfield
Woolwich

**PRELIMINARY
DRAFT**

DATE _____

APPENDIX II

MAINE REVISED STATUTES ANNOTATED

TITLE 38

§ 363. Standards of classification of fresh waters

The board shall have 4 standards for the classification of fresh surface waters.
1972, c. 618.

Class A shall be the highest classification and shall be of such quality that it can be used for recreational purposes, including bathing, and for public water supplies after disinfection. The dissolved oxygen content of such waters shall not be less than 75% saturation or as naturally occurs, and contain not more than 100 coliform bacteria per 100 milliliters.

These waters shall be free from sludge deposits, solid refuse and floating solids such as oils, grease or scum. There shall be no disposal of any matter or substance in these waters which would impart color, turbidity, taste or odor other than that which naturally occurs in said waters, nor shall such matter or substances alter the temperature of hydrogen-ion concentration of these waters or contain chemical constituents which would be harmful or offensive to humans or which would be harmful to animal or aquatic life. No radioactive matter or substance shall be permitted in these waters other than that occurring from natural phenomena.

There shall be no discharge of sewage or other wastes into water of this classification unless specifically licensed by the commission upon finding that no degradation will result to the quality of such waters, and no deposits of such material on the banks of such waters in such a manner that transfer of the material into the waters is likely. Such waters may be used for log driving if such use will not lower its classification.

1971, c. 461, § 2

Class B, the 2nd highest classification, shall be divided into 2 designated groups as B-1 and B-2.

B-1. Waters of this class shall be considered the higher quality of the Class B group and shall be acceptable for recreational purposes, including water contact recreation, for use as potable water supply after adequate treatment and for a fish and wildlife habitat. The dissolved oxygen of such waters shall be not less than 75% of saturation, and not less than 5 parts per million at any time. The total coliform bacteria count is not to exceed 300 per 100 milliliters. The fecal coliform bacteria shall not exceed 60 per 100 milliliters.

These waters shall be free from sludge deposits, solid refuse and floating solids such as oils, grease or scum. There shall be no disposal of any matter or substance in these waters which imparts color, turbidity, taste or odor which would impair the usages ascribed to this classification nor shall such matter or substance alter the temperature or hydrogen-ion concentration of these waters so as to render such waters harmful to fish or other aquatic life. There shall be no discharge to these waters which will cause the hydrogen-ion concentration or "pH" of these waters to fall outside of the 6.0 to 8.5 range. There shall be no disposal of any matter or substance that contains chemical constituents which are harmful to humans, animals or aquatic life or which adversely affect any other water use in this class. No radioactive matter or substances shall be discharged to these waters which will raise the radio-nuclide concentrations above the standards as established by the United States Public Health Service as being acceptable for drinking water. These waters shall be free of any matter or substance which alters the composition of bottom fauna, which adversely affects the physical or chemical nature of bottom material, or which interferes with the propagation of fish.

There shall be no disposal of sewage, industrial wastes or other wastes in such waters, except those which have received treatment for the adequate removal of waste constituents including, but not limited to, solids, color, turbidity, taste, odor or toxic material, such that these treated wastes will not lower the standards or alter the usages of this classification, nor shall such disposal of sewage or waste be injurious to aquatic life or render such dangerous for human consumption.

B-2. Waters of this class shall be acceptable for recreational purposes including water contact recreation, for industrial and potable water supplies after adequate treatment, and

for a fish and wildlife habitat. The dissolved oxygen of such waters shall not be less than 60% of saturation, and not less than 5 parts per million at any time. The total coliform bacteria is not to exceed 1,000 per 100 milliliters. The fecal coliform bacteria is not to exceed 200 per 100 milliliters.

These waters shall be free from sludge deposits, solid refuse and floating solids such as oils, grease and scum. There shall be no disposal of any matter or substance in these waters which imparts color, turbidity, taste or odor which would impair the usages ascribed to this classification, nor shall such matter or substance alter the temperature or hydrogen-ion concentration of the waters so as to render such waters harmful to fish or other aquatic life. There shall be no disposal of any matter or substance that contains chemical constituents which are harmful to humans, animal or aquatic life, or which adversely affect any other water use in this class. There shall be no discharge to these waters which will cause the hydrogen-ion concentration of "pH" of these waters to fall outside of the 6.0 to 8.5 range. No radioactive matter or substance shall be discharged to these waters which will raise the radio-nuclid concentrations above the standards as established by the United States Public Health Service as being acceptable for drinking water. These waters shall be free of any matter or substance which alters the composition of bottom fauna, which adversely affects the physical or chemical nature of bottom material, or which interferes with the propagation of fish.

There shall be no disposal of sewage, industrial wastes or other wastes in such waters except those which have received treatment for the adequate removal of waste constituents including, but not limited to, solids, color, turbidity, taste, odor or toxic material, such that these treated wastes will not lower the standards or alter the usages of this classification, nor shall such disposal of sewage or waste be injurious to aquatic life or render such dangerous for human consumption.

Class C. waters, The 3rd highest classification, shall be of such quality as to be satisfactory for recreational boating and fishing, for a fish and wildlife habitat and for other uses except potable water supplies and water contact recreation, unless such waters are adequately treated.

The dissolved oxygen content of such waters shall not be less than 5 parts per million, except in those cases where the board finds that the natural dissolved oxygen of any such body of water falls below 5 parts per million, in which case the board may grant a variance to this requirement. In no event shall the dissolved oxygen content of such waters be less than 4 parts per million. The total coliform bacteria is not to exceed 5,000 per 100 milliliters. The fecal coliform bacteria is not to exceed 1,000 per 100 milliliters.

1973, c. 423, § 5.

These waters shall be free from sludge deposits, solid refuse and floating solids such as oils, grease or scum. There shall be no disposal of any matter or substance in these waters which imparts color, turbidity, taste, or odor which would impair the usages ascribed to this classification, nor shall such matter or substance alter the temperature or hydrogen-ion content of the waters so as to render such waters harmful to fish or other aquatic life. There shall be no discharge to these waters which will cause the hydrogen-ion concentration or "pH" of these waters to fall outside of the 6.0 to 8.5 range. There shall be no disposal of any matter or substance that contains chemical constituents which are harmful to humans, animal or aquatic life or which adversely affect any other water use in this class. No radioactive material or substance shall be discharged to these waters which will raise the radio-nuclide concentration above the standards as established by the United States Public Health Service as being acceptable for drinking water.

There shall be no disposal of sewage, industrial wastes or other wastes in such waters, except those which have received treatment for the adequate removal of waste constituents including, but not limited to, solids, color, turbidity, taste, odor or toxic material, such that these treated wastes will not lower the standards or alter the usages of this classification, nor shall such disposal of sewage or waste be injurious to aquatic life or render such dangerous for human consumption.

Class D waters shall be assigned only where a higher water classification cannot be attained after utilizing the best practicable treatment or control of sewage or other wastes.

Waters of this class may be used for power generation, navigation and industrial process waters after adequate treatment.

Dissolved oxygen of these waters shall not be less than 2.0 parts per million. The numbers of coliform bacteria allowed in these waters shall be only those amounts which will not, in the determination of the Commission, indicate a condition harmful to the public health or impair any usages ascribed to this classification.

These waters shall be free from sludge deposits, solid refuse and floating solids such as oils, grease or scum. There shall be no disposal of any matter or substance in these waters which imparts color, turbidity, taste or odor which would impair the usages ascribed to this classification, nor shall such matter or substance alter the temperature or hydrogen-ion concentration of the waters to impair the usages of this classification. There shall be no disposal of any matter or substance that contains chemical constituents which are harmful to humans or which adversely affect any other water use in this class. No radioactive matter or substance shall be permitted in these waters which would be harmful to humans, animal or aquatic life and there shall be no disposal of any matter or substance which would result in radio-nuclide concentrations in edible fish or other aquatic life thereby rendering them dangerous for human consumption.

There shall be no disposal of sewage, industrial wastes or other wastes in such waters, except those which have received treatment for the adequate removal of waste constituents including, but not limited to, solids, color, turbidity, taste, odor or toxic material, such that these treated wastes will not lower the standards or alter the usages of this classification. Treated wastes discharging to these waters shall not create a public nuisance as defined in Title 17, Section 2802, by the creation of odor producing sludge banks and deposits or other nuisance conditions.

With respect to all classifications hereinbefore set forth, the board may take such actions as may be appropriate for the best interests of the public, when it finds that any such classification is temporarily lowered due to abnormal conditions of temperature or stream flow.

R.S. 1954, c. 79, § 2; 1955, c. 425, § 5; 1959, c. 295, § 2; 1961, c. 305, § 3; 1963, c. 274, § 1; 1967, c. 475, § 4; 1969, c. 431, §§ 1, 2; 1972, c. 618.

Presumpscot River Basin (Includes all drainage area above
the Presumpscot Falls Dam)

1957, c. 322, § 6

1. All waters, tributaries and segments of the Presumpscot River Basin, not otherwise specified or classified, with the exception of the Presumpscot River, main stem, below the upstream compact limits of Westbrook—Class B-1.
2. Frank Brook, and Pleasant River above its confluence with Frank Brook, together with tributaries thereof—Class B-2.
3. Little River, main stem, (Windham) from canning plant on Route 114 to its confluence with the Presumpscot River—Class C.
4. Outflow from Panther Pond to Sebago Lake—Class B-2.
5. Outlet of Tuttle Pond, Windham—Class B-2.
6. Pleasant River, and tributaries between Frank Brook (Gray) and its entrance to Little Sebago Lake—Class B-2.
7. Presumpscot River, main stem, below Village of South Windham to tide-water—Class C.
1967, c. 446.
- 7-A. Presumpscot River, main stem, from the outlet of Sebago Lake to the dam at Dundee—Class A.
1972, c. 612.
8. Second westerly tributary of the North Branch of Little River (Windham)—Class B-2.
9. Stevens Brook, Bridgton—Class C.
1967, c. 304, § 16.
10. Tannery Brook, and its tributaries, Gorham—Class B-2.
11. Tributaries, direct and indirect, of Songo Pond (Albany vicinity)—Class B-2.
12. Tributaries of Papoose Pond (Waterford)—Class B-2.
13. Tributaries of Coffee and Dumping Ponds, Casco, above inlet to Pleasant Lake—Class B-2.
14. Unnamed stream, entering Sebago Lake at North Sebago Village—Class B-2.

APPENDIX III

Definitions

Biochemical Oxygen Demand (BOD) - It is the measurement of the dissolved oxygen used by micro-organisms in the biochemical oxidation of organic matter. It is usually expressed for a 5 day period (BOD_5). BOD is one of the most widely used indicators of organic pollution.

Color - Apparent - It is caused by materials suspended in the water column such as silt.

True - It is caused by vegetable or organic extracts (such as tannins, lignins) primarily in the form of negatively charged colloidal particles.

Color discharging industries in Maine include the paper companies, tanneries, canneries and milk producers.

Coliform Bacteria - There are a certain type of bacteria (Fecal Coliform) that may indicate that human wastes are in a body of water. These type of bacteria are associated with warm-blooded animals.

Cubic Feet per Second (cfs) - Is a measure of stream flow or the volume of water passing a certain point in a given amount of time.

Dissolved Oxygen (DO) - It is the amount of oxygen in solution in the water. It is usually measured as milligrams of oxygen per liter of water. DO is an indicator of the organic demand of decomposing wastes in the water.

Effluent Limited - Means that a body of water is meeting or will meet its classification after the application of best practicable treatment.

Lake Stress Quality - A lake that has a trophic state caused by cultural stress.

Million Gallons per Day (MGD) - It is a measure of stream flow similar to cfs.
1 Mgd equals 1.55 cfs.

Nitrogen - Ammonia - (NH_3-N) - It is the quantity of the ammonium ion (NH_4^+) expressed as nitrogen. High ammonia nitrogen levels may indicate human pollution in a body of water as ammonia is a breakdown product of urine.

Kjeldahl - It is sum of the organic nitrogen and ammonia nitrogen levels in a sample.

Nitrate (NO_3-N) - It is plant fertilizer. High levels may be caused by agricultural fertilizer or manure runoff and associated with accelerated eutrophication of a lake or pond.

Nitrite (NO_2-N) - Is a short lived form of nitrogen that is readily converted to the nitrate form.

Organic - It is a form of nitrogen that is converted to ammonia by saprophytic bacteria.

pH - Is the negative log of the hydrogen ion concentration. The scale runs from 0 to 14. Pure water has a pH of 7. pH indicates whether the water is acidic (pH less than 7) or basic (pH greater than 7).

Phosphorus - Soluble - It is calculated by filtering the sample through a 0.45 micron phosphorus - free filter, taking the filtrate, and performing a persulfate digestion, then measuring for phosphorus.

Total - Is the amount of phosphorus measured after persulfate digestion. Phosphorus is a nutrient that can cause eutrophication.

Specific Conductance - Is a measure of the waters capacity to convey an electric charge. It can indicate in relative terms whether pollution causing materials are in the water.

Trophic Level - It is a measure of lake production often associated with the lake natural aging process. Three trophic levels have been formulated.

1. Oligotrophic - Waters with a small quantity of nutrients (nutrient poor). This level is often associated with deep cold water lakes.

2. Mesotrophic - Is a level in which nutrients exist in the water but not to such a degree as eutrophic lakes.

3. Eutrophic - This level indicates that the water is rich in nutrients. This type of lake is usually shallow and warm.

Turbidity - the measure of the interference of the transfer of light through the water by suspended matter.

Water Quality - Indicates water that is not likely to meet its classification even after best practicable treatment is applied to the discharges in the segment.

APPENDIX IV

DEPARTMENT OF ENVIRONMENTAL PROTECTION

PUBLIC NOTICE

There will be a meeting of the Greater Portland Council of Governments Areawide Citizens Advisory Committee on Wednesday, May 19, 1976 at 7:30 P. M. at the Greater Portland Council of Governments offices, 331 Veranda Street Portland (Marine Hospital)

This meeting will be held to present the proposed Presumpscot River Basin - Cumberland County Tidewater Water Quality Management Plan (prepared pursuant to Section 303 (E) of the Federal Water Pollution Control Act Amendments of 1972).

All interested persons are invited to attend this meeting and any further information may be obtained by contacting Allen Corson, Department of Environmental Protection, Division of Water Quality Evaluation and Planning, Bureau of Water Quality Control, Tel. 289-2591; or Esther Lacognata, Public Participation Coordinator, Greater Portland Council of Governments, Tel. 774-9891

The proposed Presumpscot River Basin - Cumberland County Tidewater Water Quality Management Plan is on file at the Department of Environmental Protection office and the Greater Portland Council of Governments office, Monday through Friday during regular working hours. All correspondence should be addressed to Chief, Division of Water Quality Evaluation & Planning, Bureau of Water Quality Control, Department of Environmental Protection, Augusta, Maine and received in the office of the Department prior to 5:00 P.M., June 8, 1976

William R. Adams, Jr., Commissioner
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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May 12, 1976

LEGAL ADVERTISEMENT
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DEPARTMENT OF ENVIRONMENTAL
PROTECTION

S.D. Warren Co. To Begin Treating Presumpscot Waste

By BOB CUMMINGS
Staff Writer

The end is in sight for the largest single source of water pollution in southern Maine — the wastes dumped into the Presumpscot River by the S.D. Warren Co.

A company official said Wednesday that initial operation of the plants secondary treatment plant is expected "within the next few days."

"We will start growing the bugs that will make the plant work almost immediately," Ray Peppin of the mill's environmental improvement staff said.

HIS COMMENTS came at a public hearing on a new Presumpscot River Basin pollution study by the Maine Department of Environmental Protection.

The "bugs" are the bacteria that will decay the wastes harmlessly in a giant basin at the Westbrook mill.

This decay now takes place in the river, using up the oxygen fish need to live.

S.D. Warren is slated to remove 80 per cent of the wastes that for years has choked the life of the river to death.

But Allen Corson, who prepared the new Presumpscot study, said the river won't meet state standards, even with the treatment plant in operation.

Conditions in the river will be dramatically improved, however, he predicted.

BACK COVE IN Portland is the only other water body in the area studied that also won't meet the state standards.

Corson blames this on the enclosed nature of the cove and the likelihood that it will be continued to be inundated with raw sewage from storm overflows, even after the Portland treatment plant is built.

Though the S.D. Warren plant will begin its initial tests shortly, the Presumpscot won't be immediately affected.

Treatment of wastes won't occur until a large mass of wastes build up to support massive colonies of the waste-eating bacteria.

By law plant doesn't have to be in the full operation until Oct. 1.

The Westbrook mill each day dumps wastes equivalent to those generated by a community of between 200,000 and 500,000 persons.

GROUND BREAKING for the Portland waste treatment plant is also expected in the next few days persons attending the hearing were told.

The Portland plant will be located on the site of the old East End Dump, adjacent to the Eastern Promenade Park Lot and at the mouth of Back Cove.

Back Cove now receives thousands of gallons a day of raw sewage from several sewer outfalls. Interceptor lines will collect these wastes and bring them to the treatment plant, except during heavy rainstorms or periods of fast melting snow.

The Portland treatment plant is designed to handle four times the normal dry weather flows of sewage. When storms cause this flow to be exceeded, the surplus will automatically spill into Back Cove.

Corson said it's impossible to exactly predict the affect of this waste on the cove. He said, however, the stench that now comes from the cove at low tides will be greatly improved.

Further treatment will be necessary before the area can meet state water quality standards. Among the possibilities, he said, is the separation of storm sewers from household, commercial and industrial wastes.

THOUGH PRELIMINARY construction of the Portland plant will begin quickly, it's not scheduled to be completed until 1979, and even then only 60 per cent of city's wastes will be treated.

Treatment of the rest of the wastes must await approval of additional federal funding by the U.S. Congress.

Cove, Presumpscot Won't Pass Standards, DEP Says

By BOB CUMMINGS
Staff Writer

Water quality in Back Cove and in the Presumpscot River below the S.D. Warren plant won't meet state standards even after the \$100 million in public and industrial treatment plant construction is completed, in the opinion of the Maine Department of Environmental Protection.

A new DEP report blames the buildup of decaying wastes on a century of dumping raw sewage and paper mill effluents.

A public hearing on the report is scheduled for 7:30 p.m. today at the former Marine Hospital on Veranda Street.

S. D. Warren will reduce the pollution it is dumping into the Presumpscot by 80 per cent when its new plant goes on line by early fall.

But the sediments from "years of untreated pulp and paper discharges" will continue to decay, using up oxygen in the river waters, says the DEP.

The effect of these sediments will be particularly severe during the week each July that the mill closed down and water level in the river is dropped to permit repair work, the state environmental agency says.

But the DEP concedes an agreement this spring with the paper company to keep a minimum flow in the river of 50 cubic feet of water a second will tend to alleviate the situation.

During periods when the mill is operating the flow of water in the river should be maintained at 300 cubic feet

a second or greater, the department says, to assure that oxygen levels don't drop below the standards.

The Presumpscot is classified under state law as "C," which means that it must have at least 5 parts per million of dissolved oxygen. A free flowing river with no waste load would have 7 or 8 parts per million of dissolved oxygen.

The state standards for the Presumpscot, however, would enable it to support most kinds of sports fish except trout and salmon.

Oxygen in rivers and lakes is used up by decaying wastes. This decay is measured in terms of pounds a day of BOD or "biological and chemical oxygen demand."

S. D. Warren now dumps up to 37,000 pounds of BOD a day into the river. This is the equivalent to the wastes generated by a residential community of 200,000 persons.

By law, Warren must reduce this volume to 7,300 pounds of BOD by next Oct. 1. The reduction may occur well before the deadline, however. The company's new treatment plant is almost completed and test runs are expected this summer.

In addition, the paper company dumps 100,000 pounds a day of suspended solids, a slurry of dirt and bits of pulp and water. These will be reduced to 7,000 pounds by the new treatment system.

These suspended particles don't use up oxygen, but they form the sludge banks that presently clog the river and serve as a trap for BOD.

As these sludge banks gradually are washed away,

Cove, River Won't Pass Tests: DEP

(Continued from Page One)

the entrapped BOD will be released to use up oxygen in the water, the DEP believes.

It is this gradual release of BOD from the sludge banks on the river that the DEP cites, when it says the Presumpscot probably won't meet the state standards.

Removal of the sludge, however, isn't contemplated since it probably would do more harm than good. Any large disturbance of the sludge would expose great amounts of wastes to decay. There is some evidence that the severe pollution that blighted homes along the river a decade ago probably was caused at least in part by the Interstate 95 construction that disturbed the sludge.

It's the buildup of sewage solids on the bottom of Back Cove that makes the DEP think that the cove won't meet the standards even after the Portland treatment plant is built.

Also contributing to Back Cove's problem, the new report says, is the storm water overflow that is built into the new treatment plant's design.

Portland has sewers that combine both storm water and sewage. The treatment plant is designed to handle the combined flow generated by moderate storms. But heavy rains and melting snows are to be shunted past the plant, allowing untreated sewage to be discharged overboard.

Despite the limitations caused by the sludge buildup and the combined sewers, the DEP study says area waters will be remarkably cleaner once the treatment plants are completed.

Bridgton has the most severe problems among the outlying communities, the DEP survey reveals. Sewers in that town now dump about 40,000 gallons of wastes a day into Long Lake, part of the Sebago Lake system that provides drinking water for most of Greater Portland.

Bridgton has pondered waste treatment plants for several years, but has not yet made up its mind about what system, if any, to install.

Gorham and Standish also have small raw sewer with no pending treatment plans.

But most other towns in the region, the DEP says, either have treatment systems under construction, or are only awaiting promised federal subsidies before beginning construction.

Tonight's hearing will be the first part of a regular meeting of the Areawide Citizens Committee of the Greater Portland Council of Governments.

The committee is studying ways of assuring clean water in the region.

APPENDIX V

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I

J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203

April 7, 1976

Allen J. Corson
Bureau of Water Quality Control
Department of Environmental Protection
Statehouse
Augusta, Maine 04330

Dear Al:

I have reviewed the "Draft, Presumpscot River Basin Plan" prepared pursuant to Section 303(e) of the FWPCA Amendments of 1972. I believe the plan substantially meets the intent of the law with the exception of the following areas:

1. For all proposed discharges into or upstream of impoundments, the basin plan should indicate the level of "P" removal required as per DEP regulations.
2. A record of public participation on the plan is required.

If you have any questions, contact me.

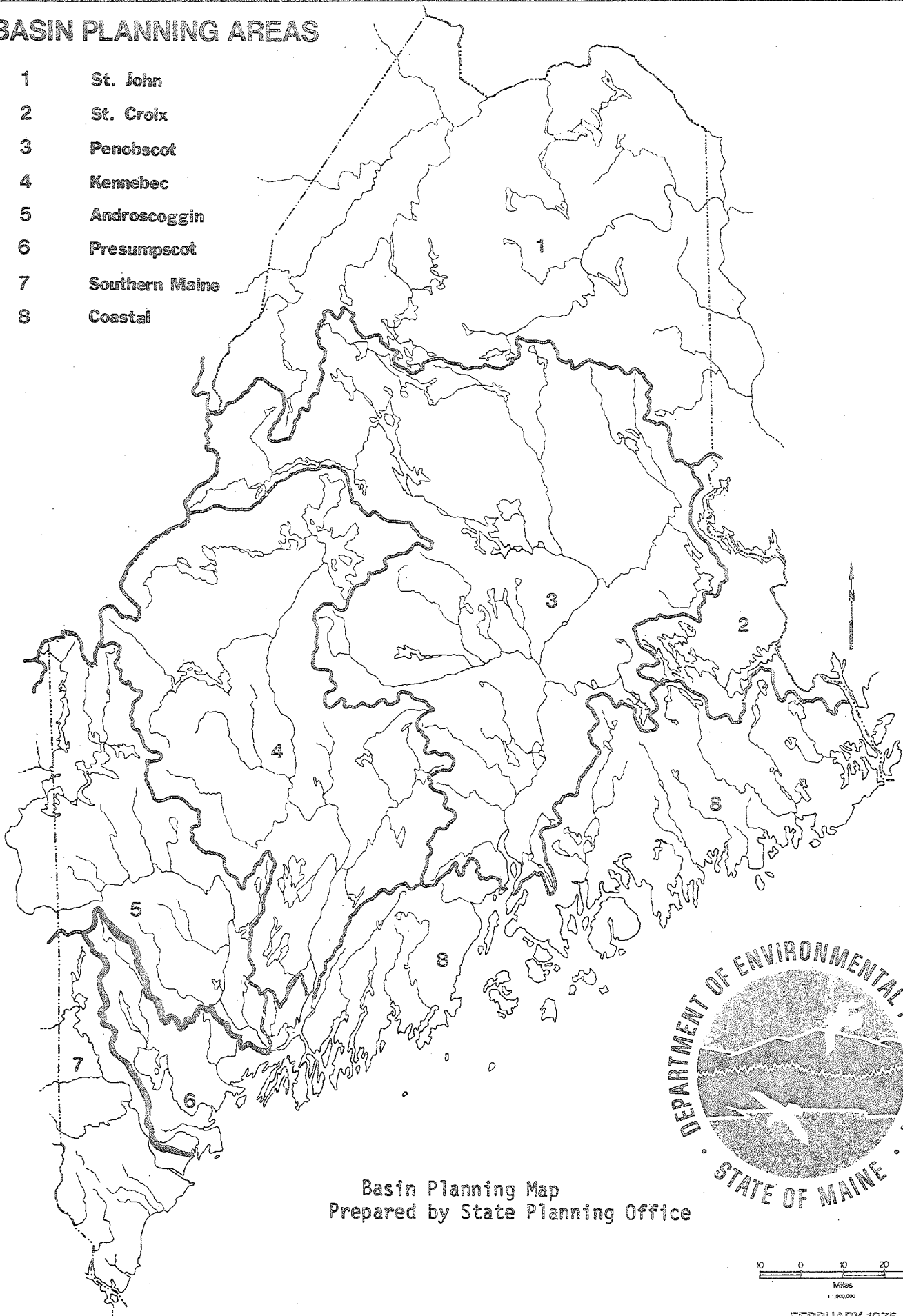
Sincerely yours,

Mark C. Possidento
Water Quality Branch

APPENDIX VI

BASIN PLANNING AREAS

- 1 St. John
- 2 St. Croix
- 3 Penobscot
- 4 Kennebec
- 5 Androscoggin
- 6 Presumpscot
- 7 Southern Maine
- 8 Coastal



Basin Planning Map
Prepared by State Planning Office

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