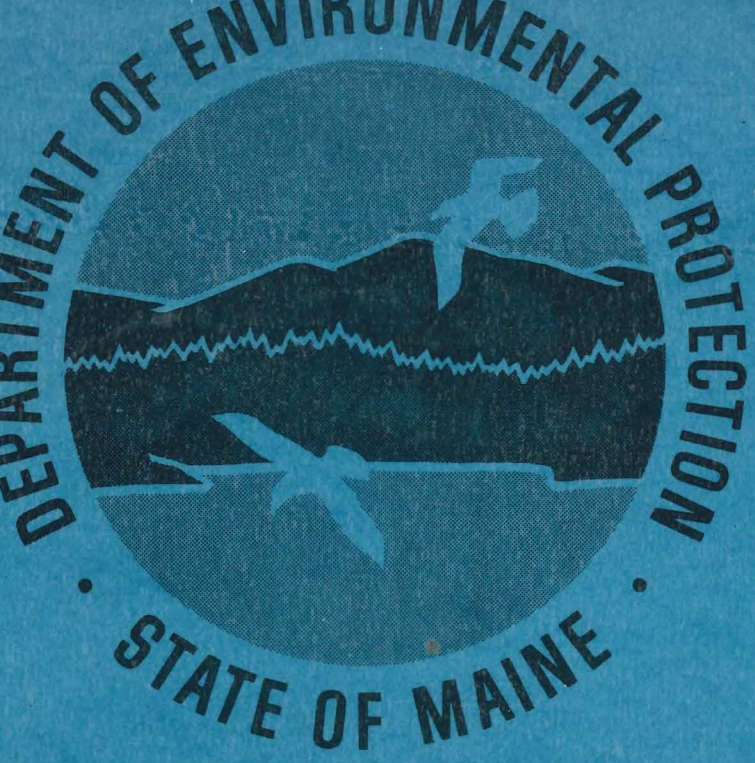

Sebasticook River Basin Water Quality Management Plan

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

June 1976

SEBASTICOOK RIVER BASIN

WATER QUALITY MANAGEMENT PLAN

Prepared by the Maine Department of Environmental Protection

Bureau of Water Quality Control

Division of Water Quality Evaluation and Planning

Pursuant to Section 303 (e) of the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500)

June, 1976

STATE OF MAINE
Department of Environmental Protection

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June 14, 1976

Mr. John A. S. McGlennon
Regional Administrator
Environmental Protection Agency
J. F. K. Federal Building
Boston, Massachusetts 02203

Dear Mr. McGlennon:

Enclosed is the Sebasticook River Basin 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.

The most significant overall conclusion presented in the report indicates that most waters in this drainage area are of low quality, probably the lowest in overall quality for a drainage basin of its size in Maine. Almost the entire main stem and all of the East Branch of the Sebasticook River are designated "Water Quality Segments (WQS)". In addition there are four "Lake Stress Quality (LSQ)" lakes located within the basin planning area. Coordinated facilities planning for towns and industries along the East Branch and Main Stem should aid in the improvement of the present water quality.

Copies of this plan were made available at the Southern Kennebec Valley and North Kennebec Regional Planning Commissions as well as the DEP Augusta office. Copies were distributed to industries, municipalities, sanitary and water districts, organizations and concerned citizens expressing an interest in the water quality of the basin. A public presentation was made in June, 1975 at the North Kennebec RPC offices. In addition to commission members, many concerned citizens, over 30 from the Sebasticook Lake Association, attended to express opinion and voice support for the Basin Plan. All comments were considered for incorporation into this final report.

Very truly yours,

William R. Adams, Jr.

William R. Adams, Jr.
Commissioner

WRA:AJC:gk

Enc.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203

June 4, 1975

Steven D. Freedman
Bureau of Water Quality Control
Department of Environmental Protection
Statehouse
Augusta, Maine 04330

Dear Steve:

We have reviewed the Preliminary Draft of the Sebasticook River Basin Water Quality Management Plan in accordance with the Federal Regulations 40 CFR 131. The plan substantially meets the intent of those regulations however further discussion of the following areas is required before we can proceed with approval:

1. A more detailed analysis of the demographic features of the basin. Specifically some indication of land use and development patterns should be included.

2. A ranking of segments to reflect priorities for construction or other needs.

3. In relation to (2) above, more specific schedules of compliance and target abatement dates. Further, the relationship between the Basin Plan's schedules and the schedules in the NPDES permits should be addressed.

4. A program for future non-point source monitoring and abatement needs. Since this basin will not be covered by a 208 plan it is the requirement of the State to perform the non-point source analysis. For this reason, scheduling of such work should be initiated at this point in the planning process for the Sebasticook basin.

Upon revising the plan to include the information listed above our review can be completed. If there are any questions, please contact me.

Sincerely yours,

Mark

Mark C. Possidento

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I. Summary, Conclusions, and Recommendations

A. Summary

The waters of the Sebasticook River, including the East Branch, are presently of very low quality due to the discharge of large amounts of untreated and partially treated municipal and industrial wastes. The Maine Department of Environmental Protection classified the waters of Main Stem from Hartland to Winslow and the entire East Branch as Water Quality (WQ) Segments pursuant to U.S. Environmental Protection Agency regulations and guidelines on water quality management planning, (40 CFR Parts 130 and 131). The WQ designations denote that wastewater treatment levels beyond baseline, or "best practicable treatment" may be required in order to meet the stream standards established by the Maine Legislature. The drainage area also contains some impoundments with low water quality, most notably, Sebasticook Lake and Douglas Pond.

The Sebasticook Drainage, the Kennebec River Basin's largest tributary area, has only two municipal wastewater treatment facilities operating at this time, one at Corinna on the East Branch and one at Unity on Twenty-five Mile Stream. The Corinna facility also treats the wastes from the Eastland Woolen Mill. Both Corinna and Dexter, its neighbor seven miles upstream, discharge wastes via the East Branch into Sebasticook Lake, a highly eutrophic impoundment. Newport, and H.P. Hood discharge untreated wastes to the East Branch below the lake causing, during low flow periods of the year, severe degradation from Newport to the confluence with the Main Stem. Newport received funds for final planning (Step 3) for a joint facility, this year, while Dexter and Corinna will each be receiving funds to develop facilities plans.

The Main Stem is heavily stressed beginning at Hartland due to the Irving Tanning and town discharges. Other Main Stem communities discharging raw wastes are Pitts-

field, Clinton, and Winslow. A joint treatment facility to serve Hartland and the Tannery is presently under construction with scheduled completion due in November, 1976. Pittsfield has received Fiscal Year 1976 construction grant funds and should break ground to initiate construction in July, 1976.

Clinton, a lower statewide priority, should be eligible for a Step 1 facilities planning grant in FY 77. Winslow has started constructing interceptor sewers to join in the City of Waterville wastewater treatment facility, presently under construction.

Water quality, velocity, streamflow, and biological data was gathered over a two-year period on the Sebasticook and E. Branch. The data was used to develop waste load allocations for the various sources of wastes in the "water quality" segments, most notably the Hartland and Newport areas. The allocations will be the basis for permits and licensing activities of the DEP and EPA. The Dexter-Corinna waste load allocation could not be successfully developed with the current available data.

The streamflow gaging of the Sebasticook River was historically limited to a single U.S. Geological Survey station at Pittsfield below the East Branch confluence. Since the spring of 1975 the U.S.G.S. and DEP have established 7 temporary staff gages at various locations within the East Branch sub-basin. This additional gaging was necessary for future waste management decisions and revisions to this plan.

B. Conclusions

The following conclusions are presented on the water quality of the Sebasticook River Drainage:

1. Most waters of this drainage are of low quality, and are probably the lowest in overall quality for a drainage of its size in Maine.

2. Although slight improvements in water quality have occurred below Corinna and Unity due to operating waste abatement facilities, the progress of the overall abatement program has proceeded rather slowly.

3. Sebasticook Lake, a highly eutrophic impoundment, continually receives phosphorus from Dexter and Corinna. The true picture of the lake's capabilities for improvement, however, will not be known until the present nutrient balance and sediment study is completed and analyzed on the lakeshed.

4. Additional streamflow and water quality data will be necessary to further allocate or refine the waste loads in the drainage.

C. Recommendations

The following recommendations are presented concerning the water quality management of the Sebasticook Drainage:

1. A nutrient balance should be developed for the East Branch of the Sebasticook River beginning at the outlet of Sebasticook Lake and extending upstream to the outlet of Wassookeag Lake. This study, including a sediment study of Sebasticook Lake is necessary to adequately determine the required treatment levels of Dexter and Corinna. Presently, both nutrient balance and sediment studies are being conducted, with results scheduled to be completed in the summer of 1976.

2. Dexter and Corinna, including their industries which are presently discharging raw or partially treated wastewaters should develop a coordinated facilities plan. This plan should use the nutrient loading data generated from number (1), above, as the water quality design factors.

3. Physical and hydrological data should be gathered on the East Branch below Dexter. This data, presently being gathered in conjunction with the nutrient balance, will be used to further refine the allocation for the segment.

4. Clinton, including its industries, should prepare a facilities plan some time in the near future.

5. Permanent streamflow gaging and water quality recording devices should be established on the Main Stem below Hartland and on the East Branch below Corinna and/or Newport. These gages will be used by the DEP to adequately monitor water quality as treatment facilities go online. These gages will also be used by the DEP and the dischargers that have licenses and permits with streamflow related discharge parameters. The data gathered will assist the DEP in further waste load allocation requirements, water quality standard revision proposals, and other water quality management decisions.

6. Additional water quality data should be gathered in the drainage on the major tributaries to determine the water quality situation of these areas and to detect possible non-point sources of wastes.

7. The water quality segment designation for the Sebasticook River below the Pittsfield Dam, River Mile 22.0, should be reassessed once the planned wastewater treatment facilities are operating at Hartland, Pittsfield and Newport.

II. Introduction

A. Purpose

This plan was prepared by the Maine Department of Environmental Protection, Bureau of Water Quality Control, Division of Water Quality Evaluation and Planning, pursuant to Section 303(e) of the Federal Water Pollution Control Act Amendments of 1972 and Title 40 of the Code of Federal Regulations, Parts 130 and 131. The purpose of this water quality management plan is to present the existing water quality of the Sebasticook Basin and to discuss the management decisions and alternatives necessary to bring the water quality in line with State and Federal goals and requirements. This plan will also discuss the required treatment levels to achieve the above goals where stringent treatment levels are needed due to the nature of the poor quality waters of the Basin.

This plan is the result of a two year major data gathering effort by the DEP, with financial assistance from EPA. The DEP conducted an intensive sampling survey during the summer of 1973 including water quality data, time of travel studies, flow measuring studies, and a biological survey. The EPA, through a contract with Halcon Computer Technologies, had a mathematical water quality model developed for the DEP for the Kennebec and Sebasticook Rivers, including the East Branch. This model was used to develop the load allocations which are discussed in a later section of this plan.

In addition to the 1973 survey, the DEP contracted with the E.C. Jordan Co., engineers of Portland, for water quality sampling and analysis during the summer of 1974. The DEP continued to conduct time of travel studies and flow measuring studies during 1974 to complement the modeling and load allocation process.

Additionally, the DEP is in the process of completing a nutrient analysis and budget for Sebasticook Lake, and the East Branch of the Sebasticook River. The pur-

pose of this survey is to:

1. To determine phosphorus loadings to Sebasticook Lake from the East Branch and other tributaries and to determine how these loadings vary with stream flow and time.

2. To determine possibilities of in stream phosphorus removal in the East Branch, especially at Corundel Lake.

3. To determine the phosphorus load in the lake sediments and any release of this load into the lake.

4. To determine how (1) and (3) above affect phosphorus concentrations in the lake and resulting algal problems.

5. To determine through (1), (2), (3), and (4) what the best course of action for facilities construction in Dexter and Corinna would be.

The water quality data will be presented in Section III of the plan, Water Quality. The model will be partially described in the appendix.

The map on the following page shows the Sebasticook River Basin's relation to other major river basins in the State of Maine.

B. Basin Description

The Sebasticook River Basin is the largest sub-basin of the Kennebec River drainage. The total drainage area of the Basin is 975 square miles* at its mouth in Winslow where it meets the Kennebec. Other drainage areas are as follows:

890 square miles at Benton Falls

849 square miles at Clinton

754 square miles below Twenty-five Mile Stream

611 square miles above Twenty-five Mile Stream

571 square miles below East Branch

325 square miles above East Branch

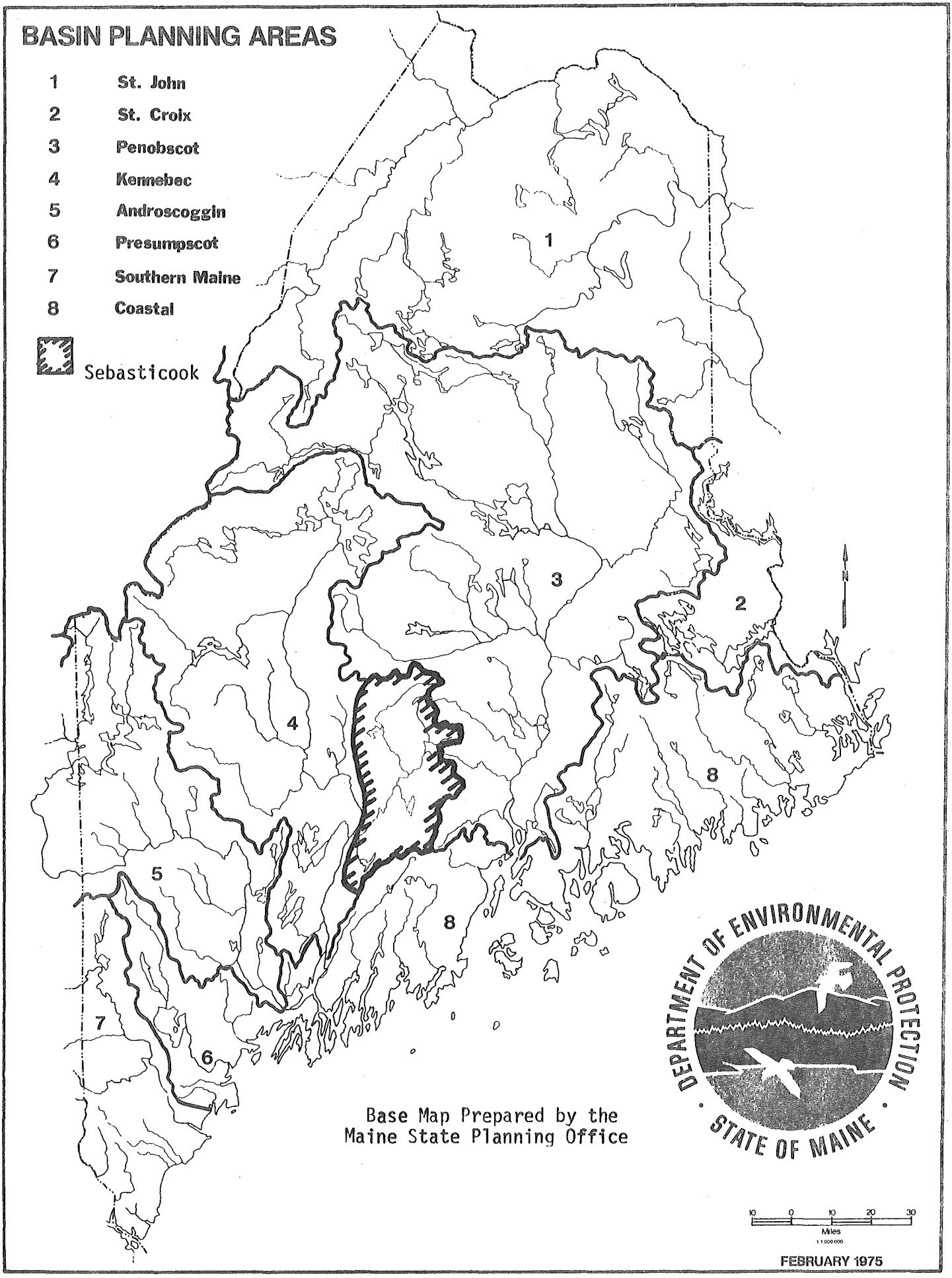
320 square miles at Pittsfield

235 square miles at Moose Pond Outlet

246 square miles for total East Branch

135 square miles at Sebasticook Lake Outlet, East Branch

*Data taken from Maine State Water Commission 1913 Fourth Annual Report.


BASIN PLANNING AREAS
1 St. John
2 St. Croix
3 Penobscot
4 Kennebec
5 Androscoggin
6 Presumpscot
7 Southern Maine
8 Coastal
Sebasticook
1
2
3
4
5
6
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8
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8
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Base Map Prepared by the
Maine State Planning Office
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE OF MAINE
10 0 10 20 30
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FEBRUARY 1975

The major communities in the Basin are Hartland, Pittsfield, Burnham, Clinton, Benton and Winslow on the main stem and Dexter, Corinna, Newport, Detroit and Pittsfield on the East Branch. These communities and their associated domestic wastes, coupled with untreated industrial discharges severely burden both the Main Stem, and East Branch of the Sebasticook. On the Main Stem Irving Tanning Co. and Edwards Corp., a metal plating operation, contribute substantial amounts of pollutants. On the East Branch, Dexter's industrial inputs of Amos Abbott Co. (textiles) and Fayscott Landis Corp. (machinery), Corinna's Eastland Woolen Mill, and H.P. Hood's dairy process at Newport contribute to the current state of less than optimal water quality. Surrounding areas include a substantial amount of farmland with its resultant non-point source of pollution. The table below presents the communities in the Basin that are of importance to the water quality, and their population.

	Population 1970	% Change 1960-1970
Benton	1729	13.7%
Burnham	803	6.2
China	1850	18.5
Clinton	1971	14.0
Corinna	1700	-10.3
Detroit	663	17.6
Dexter	3725	- 5.7
Hartland	1414	- 2.3
Newport	2260	- 2.7
Palymra	1104	9.4
Pittsfield	4274	6.6
Plymouth	542	9.4
St. Albans	1041	12.3
Unity	1280	30.2
Vassalboro	2618	7.0
Winslow	7299	23.9

The following table presents the principal lakes and ponds in the Basin and some of their morphometric characteristics:

	Surface Area (Acres)	Estimated Volume (Acre ft.)	Outlet Stream
China Lake	3922	86,500	Outlet Stream
Winnecook Lake (Unity Pond)	2526	40,000	Twenty-five Mile Stream
Great Moose Lake	3504	52,000	Sebasticook River
Sebasticook Lake	4288	84,473	E. Branch, Sebasticook River
Wassokeag Lake	1062	20,400	E. Branch, Sebasticook River

The Sebasticook River Basin has no homogeneous land use and pattern of development. Great Moose Pond, at the origin of the Main Stem, provides recreational opportunities and has had limited development with a good quality of water. Wassookeag Lake at the East Branch headwaters is a municipal water supply and maintains a Class "A" standard. Development is light with the heaviest concentrations within the Town of Dexter. Sebasticook Lake in Newport has nearly 300 cottages along its perimeter as well as bordering farmland. Further development and recreational use is doubtful until algal blooms, high bacteria counts and odors are abated. Between the confluence of the East Branch and Main Stem below Pittsfield and the junction with the Kennebec below Winslow, bordering lands are primarily rural-agricultural with limited recreational use and development. In the southern Basin area east of Waterville, two small ponds , Lovejoy (324 acres) and Pattee (712 acres) experience eutrophic problems. Lovejoy although limited in cottage development suffers from non-point sources, namely inorganic fertilizer and manure application with resultant runoff from steep bordering slopes. Pattee Pond suffers associated euthrophic conditions because of heavy cottage development with poor subsurface disposal systems. China Lake located at the southern extremity is the Basin's second largest lake. Situated approximately equidistant from Augusta and Waterville, a growth of year round homes as well as seasonal dwellings has resulted. Cottage development and non-point sources along the eastern shore have contributed a moderate amount of pollutants. The western shore, is primarily owned by the Kennebec Water District to protect its intakes for the supply of water to the City of Waterville.

There are six dams on the Main Stem and ten dams on the East Branch as well as 27 located on tributaries which are noteworthy. The following listing was obtained from MIDAS File #543W, Dam Inventory prepared by the Maine State Planning Office in 1975.

Main Stem and East Branch Dams

IMPOUNDMENT	LOCATION	RM	OWNERSHIP	HEAD (ft)	CONDITION	FIELD CHECK	REMARKS
Main Stem Fort Halifax Dam	Winslow	0.2	Central Maine Power	23	Good	1972	1500 kw h.e.p.
Main Stem	Burnham	22.0	Burnham Hydro Co. (Keddy)	27		1969	
Main Stem Lower Dam	Pittsfield	32.4	J.R. Cianchette	10		1969	
Main Stem Upper Dam	Pittsfield	32.9	Town of Pittsfield	11	Good	1966	
Main Stem	Hartland	41.0	Irving Tanning Co. Hartland Tanning Div.	8	Fair	1973	
Great Moose Lake (Main Stem)	Hartland	41.3	Town of Hartland	17	Fair	1973	24,000 A/ft. usuable storage
East Branch	Newport	8.3	Guilford Inc.	13		1969	Second dam below Sebasticook Lake
Sebasticook Lake (East Branch)	Newport	8.6	Town of Newport	8	Poor	1973	20,000 A/ft. usuable storage
East Branch	Corinna	14.2	Eastland Woolen Mills	14	Good	1973	
East Branch	Corinna	14.6	Eastland Woolen Mills	14	Good	1973	
East Branch Middle Dam	Corinna	19.1	Eastland Woolen Mills	14	Good	1973	For regulation and fire protection
East Branch Upper Dam	Corinna	20.3	Eastland Woolen Mills	12	Good	1973	
East Branch	Dexter	22.0	Dexter Utility District	9	Good	1973	Outlet of Wessookeag Lake

Tributary Dams

IMPOUNDMENT	LOCATION	OWNERSHIP	HEAD (ft.)	CONDITION	FIELD CHECK	REMARKS
China Lake Outlet	Vassalboro	Ladd Paper Co.	9	Fair	1973	
China Lake Outlet	Vassalboro	American Woolen Co.	16		1969	
China Lake Outlet	Vassalboro	H. Brewer	15		1969	
China Lake Outlet	Vassalboro	Unknown	4		1969	
China Lake Outlet	Vassalboro	L.Z. Massee & Son	13		1969	
China Lake	Vassalboro	Town of Vassalboro	7	Good	1970	20,000 (A/ft. usuable storage
Pattee Pond Br.	Winslow	Unknown	15		1969	
Pattee Pond	Winslow	Unknown	2		1966	Temporary structure
Lovejoy Pond	Albion	Clarence Chalmers	2	Good	1966	
Unity Pond	Unity	Unknown	3	Poor	1969	
Sandy Pond	Freedom	Unknown			1966	
Carlton Pond	Troy	U.S. Fish and Wild-life Service		Poor	1966	
Plymouth Pond	Plymouth	Town of Plymouth	9	Good	1973	9,000 A/ft. usuable storage
Brewer Bros. Marsh Dam #2	Palmyra	IF&G	6	Good	1970	Located just north of Route 2
Mulligan Stream	St. Albans	IF&G	5	Good	1970	Impoundment for game management area
Nokomis Pond	Palmyra	NA	4		1966	Local water supply
Pleasant Lake	Stetson	NA	5	Poor	1966	
Puffers Pond (Echo Lake)	Dexter	Dexter Lumber Co.	6	Poor	1966	Bridge and Dam

Tributary Dams (Continued)

IMPOUNDMENTS	LOCATION	OWNERSHIP	HEAD (ft.)	CONDITION	FIELD CHECK	REMARKS
Madawaska Brook	Palmyra	IF&G	10	Good	1970	Impoundment for game management area
Whites Pond	Palmyra	NA	4	Poor	1966	
Indian Stream	St. Albans	Harold Bishop	8	Poor	1963	
Big Indian Pond	St. Albans	Town of St. Albans	9	Good	1966	
Ripley Pond	Ripley	Unknown	5	Good	1966	Fish barrier
Barker Pond	Cornville	Unknown			1966	
Trout Pond	Brighton Plt.	Unknown		Poor	1966	
Cambridge Pond	Cambridge	Sawmill owner		Fair	1966	
Center Pond	Sangerville	Unknown	3		1966	

III. Water Quality

A. Segment Classification

One of the key requirements concerning basin planning under Section 303(e) is the designation of the waters as either Effluent Limitation (EL) or Water Quality (WQ) classes. EPA defined EL and WQ segments as follows:

> 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 Section 301 (b) (1) (A) and 301 (b) (1) (B) of the Act.

The DEP has added a third designation or category; Lake Stress Quality (LSQ). This new category was added since neither the above two classes adequately deals with culturally stressed impoundments. DEP defined LSQ segments as follows:

> Lake Stress Quality: This classification denotes that the impoundment may not presently be in violation of its assigned standard but is in such a trophic state that some or all normal uses are impaired.

These classifications, EL, WQ, and LSQ, are not to be confused with Maine's Surface Water Classification System which classifies waters according to their usage. This system uses A, B-1, B-2, C and D, with A waters being the highest quality water. The State water quality classification system is included in Appendix VI.

The Sebasticook River and the East Branch have been classified as WQ for the following areas:

Sebasticook River RM 39.8 (Irving Tanning Co. outfall, Hartland) to RM 0.0 (confluence with Kennebec River, Winslow)

East Branch RM 22.9 (Wassookeag Lake Outlet, Dexter) to RM 0.0 (Confluence with Main Stem, Pittsfield)

The following impoundments have been classified as LSQ:

Lovejoy Pond, Albion

Pattee Pond, Winslow

Sebasticook Lake, Newport (also WQ)

Three Mile Pond, China, Vassalboro, Windsor

Douglas Pond, Palmyra and Pittsfield (also WQ)

These portions of the Sebasticook Basin have been so designated since treatment levels beyond what EPA has defined as best practicable treatment (BPT) may be required to bring their quality up to their legal classifications. BPT has been defined as secondary treatment for municipal wastes and similar treatment for industrial sources with each industrial category having its own guidelines.

B. Existing Water Quality

The water quality of the Sebasticook River, including the East Branch, is presently very low. There are only two completed treatment facilities in the entire Basin, a municipal secondary lagoon system for the Town of Unity on Twenty-five Mile Stream and a secondary facility at Corinna for the Town and Eastland Woolen Mill, the major industry in that community. The operation of the latter facility, however, has not been satisfactory, and additional work needs to be done.

The major problem areas of the Basin are presented below:

a. Corinna to Sebasticook Lake inlet, and

b. Newport to Detroit on the East Branch.

c. Hartland to Douglas Pond inlet, and

d. Pittsfield to Burnham on the Main Stem.

e. Douglas Pond, Sebasticook Lake, Lovejoy Pond, Three-Mile Pond, and Pattee Pond are also quality problems.

The chief causes of problems in these areas are untreated or inadequately treated domestic and industrial wastes. The problems associated with Lovejoy and Pattee Ponds are chiefly caused by non-point sources of pollution. Although the next section, Waste Sources, discusses the major sources in greater detail, the table below presents the industrial discharges in the Basin that are key factors in the present low water quality:

Irving Tanning - Hartland	(leather)
Edwards Corp. - Pittsfield	(metal plating)
Amos Abbott Co. - Dexter	(textile)
Fayscott Landis Corp. - Dexter	(machinery)
Eastland Woolen Mill - Corinna	(textile)
H.P. Hood - Newport	(dairy)

The DEP conducted an intensive water quality survey on the Sebasticook River and East Branch during the summer of 1973. In addition, the DEP contracted with E.C. Jordan Co. of Portland for an intensive survey during the summer of 1974. Both surveys were conducted from Hartland to Winslow on the Main Stem and on the entire East Branch. The DEP also conducted flow measuring and time of travel studies for both years. The flow measuring was necessary since the USGS maintains only one gage in the entire Basin at Pittsfield on the Main Stem below the confluence of the East Branch.

DEP staff gages were established at Hartland, Corinna and Newport. These three gages, in combination with the USGS gage, presented a clear picture of the stream flow during the time of travel studies and the water quality studies.

The DEP also established a Primary Monitoring Network station on the Sebasticook River at West Palmyra just above the inlet to Douglas Pond. This station, one of

19 established statewide during the last two years, will be sampled monthly for key parameters.

In addition to the water quality and physical data gathering, the Sebasticook and East Branch was mathematically modelled through an EPA contract. This water quality model, which was verified and calibrated using the above two years of data, was used to develop the load allocations which are presented in a later section.

The 1973 and 1974 water quality data is presented graphically following this section. A map showing the sampling stations precedes the data. Data on the USGS Pittsfield gage is presented below.

Discharge (cfs)	Percent of Time
12	98.5
25	96.6
51	95.0
110	90.9
220	78.3
460	50.7
950	26.2
2500	9.3

7 Day Low Flow

Non Exceed Prob.	Recurrence Interval	Discharge (cfs)
0.0500	20.00	20.3
.1000	10.00	31.2
.2000	5.00	49.8
.5000	2.00	103.6
.8000	1.25	178.0
.9000	1.11	220.7
.9600	1.04	265.3
.9800	1.02	292.1
.9900	1.01	314.3
.9950	1.01	332.7

As can be seen from the above table, the 10 year drought flow of the Sebasticook River is quite low at the Pittsfield gage, 31.2 cfs with a Basin area of 579 square miles. Using simple proportional areas, the 10 year drought flows would be as follows for the key locations in the Basin:

7.3 cfs	Sebasticook Lake Outlet, Newport, East Branch
12.7 cfs	Moose Pond Outlet, Hartland, Main Stem
17.2 cfs	Pittsfield, above East Branch, Main Stem
31.2 cfs	USGS gage, Pittsfield, Main Stem
52.5 cfs	Winslow, at confluence with Kennebec River

C. Lake Water Quality

The Sebasticook drainage contains a number of impoundments ranging in size from 4,288 acre Sebasticook Lake to small ponds of less than 5 acres. The water quality of these impoundments varies significantly. Sebasticook Lake in Newport on the East Branch is highly eutrophic and has been for some time. The lake has considerable economic value to Newport, as it is the largest impoundment located in a single Maine municipality. The lake has been studied twice by the Federal government with the resulting reports published:

"Fertilization and Algae in Sebasticook Lake, Maine", Federal Water Pollution Control Administration, U.S. Public Health Service, January, 1966

"Report on Sebasticook Lake, Penobscot County, Maine", U.S. EPA, National Eutrophication Survey Working Paper Series, National Environmental Research Center, Las Vegas, Nevada, June, 1974

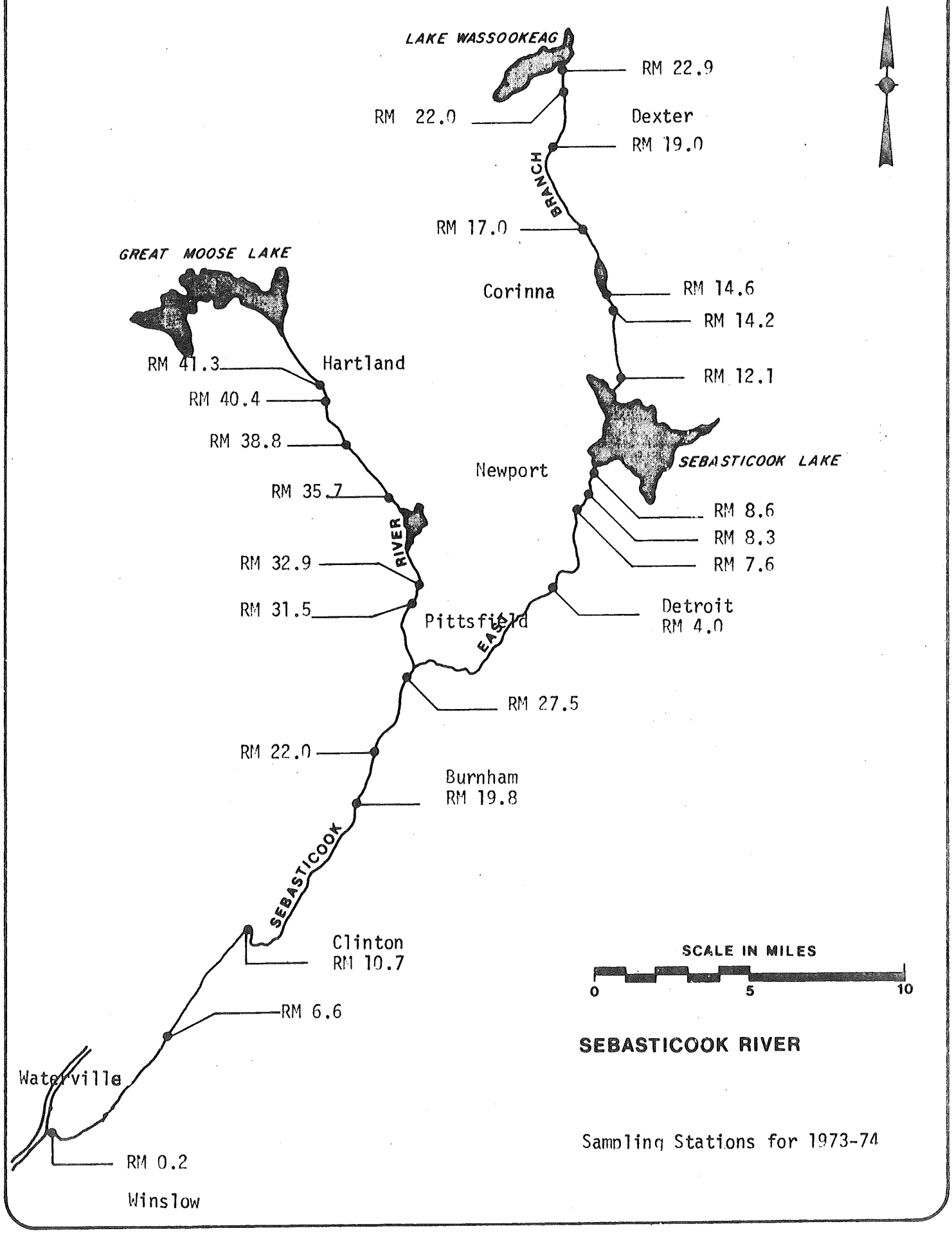
The first study was conducted at the request of then Governor John Reed to assist the State in determining the causes of the excessive algae growth and to determine remedial measures. The report recommended the treatment of the municipal and industrial wastes in Dexter and Corinna, including phosphorus removal and disinfection. These two communities lie on the East Branch upstream of the lake. At

the time of the report, there were more wastes entering the lake from the towns than are presently discharged. The later report concludes that the lake is still eutrophic although a secondary treatment facility has been built in Corinna for the Town and Eastland Woolen Mills. The report reaffirms that phosphorus removal from the two towns would greatly reduce the incoming phosphorus load to the lake. The Town of Dexter and its industries presently discharge untreated wastes which eventually effects the lake. The Corinna facility, which has operational problems, also continues to plague the lake's quality. Both communities will be developing facilities plans in fiscal year 1977 to assist them in solving their abatement problems.

Sebasticook Lake, as well as Douglas Pond, have been classified by the DEP as Water Quality Segments, (See Segment Classification). Douglas Pond, which is located on the Main Stem below Hartland, has very low water quality, consisting of high nitrates and low dissolved oxygen, among other problems. The cause of this poor quality is the untreated discharge from Hartland Tanning, a division of Irving Tanning located upstream of the Pond. The Town of Hartland also discharges untreated wastes but the relative quantity is insignificant when compared with the tannery's effluent. The Town and the tannery are constructing a joint waste treatment facility which should improve Douglas Pond's quality. Chromium deposits, however, will continue to exist in the Pond for many years.

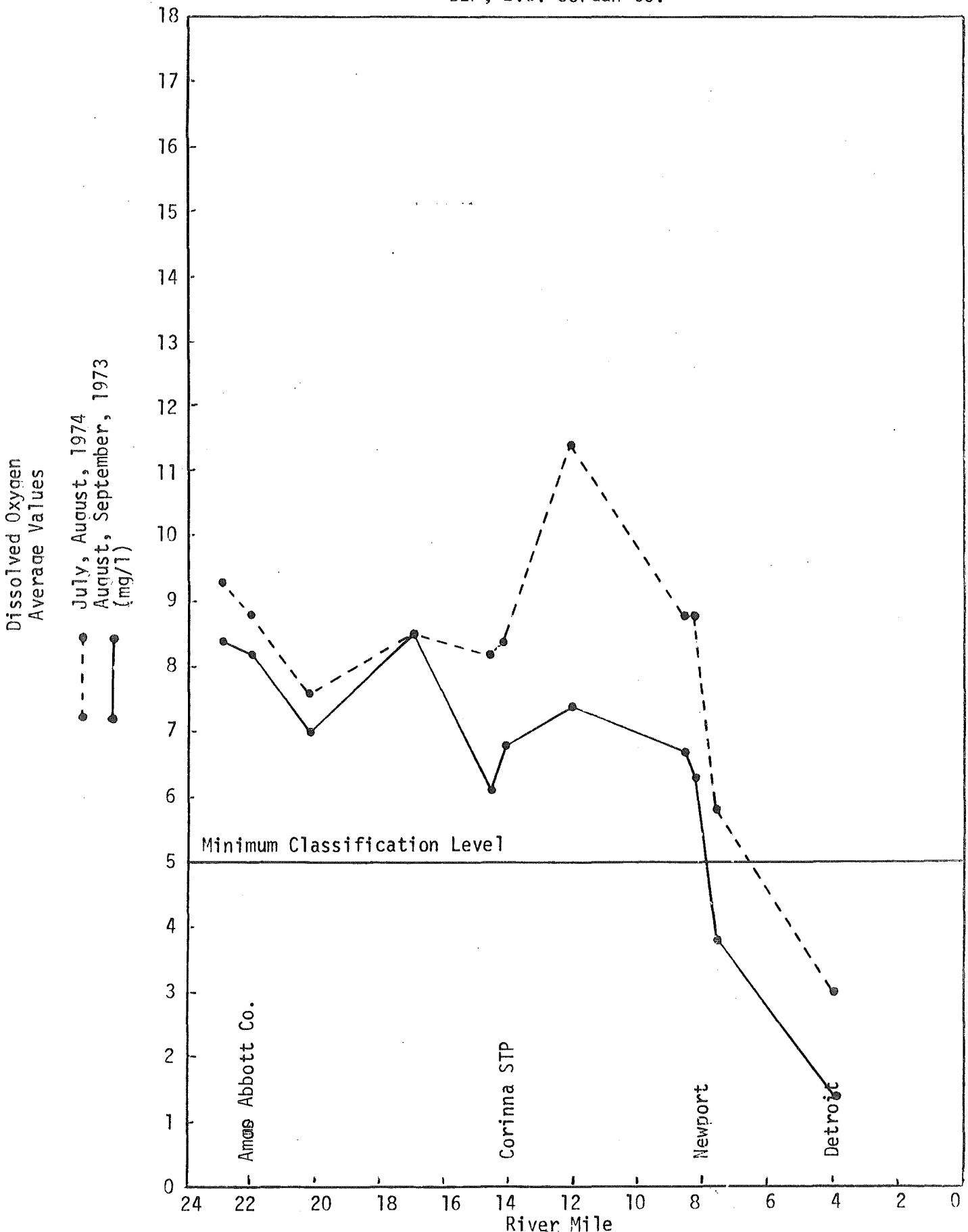
China Lake, the Sebasticook Basin's largest lake in terms of volume is the source of water supply for the Kennebec Water District which serves most of the greater Waterville area. This lake, which is also used intensively for recreation, has experienced algae blooms in past years. Pattee Pond and Lovejoy Pond have also experienced algae problems. The latter two impoundments have been classified as Lake Stress Quality.

The DEP, through its Great Ponds Program, has embarked on a lake classification program which will greatly assist in both preserving high quality impoundments as well as improving those that are eutrophic. This program was recently initiated by the DEP through an act of the Maine Legislature. The State funds appropriated were to be matched with Federal funds through Section 314 of PL 92-500. This section, however, was not funded because of Presidental impoundments.


LAKE WASSOOKEAG
RM 22.9
RM 22.0
Dexter
RM 19.0
EAST BRANCH
RM 17.0
GREAT MOOSE LAKE
Corinna
RM 14.6
RM 14.2
RM 41.3
Hartland
RM 12.1
RM 40.4
RM 38.8
Newport
SEBASTICOOK LAKE
RM 35.7
RM 8.6
RM 8.3
RM 7.6
SEBASTICOOK RIVER
RM 32.9
RM 31.5
Pittsfield
Detroit
RM 4.0
EAST
RM 27.5
RM 22.0
Burnham
RM 19.8
SEBASTICOOK
Clinton
RM 10.7
RM 6.6
Waterville
RM 0.2
Winslow
SCALE IN MILES
0
5
10
SEBASTICOOK RIVER
Sampling Stations for 1973-74

Sebasticook River
East Branch
Dissolved Oxygen vs. River Mile

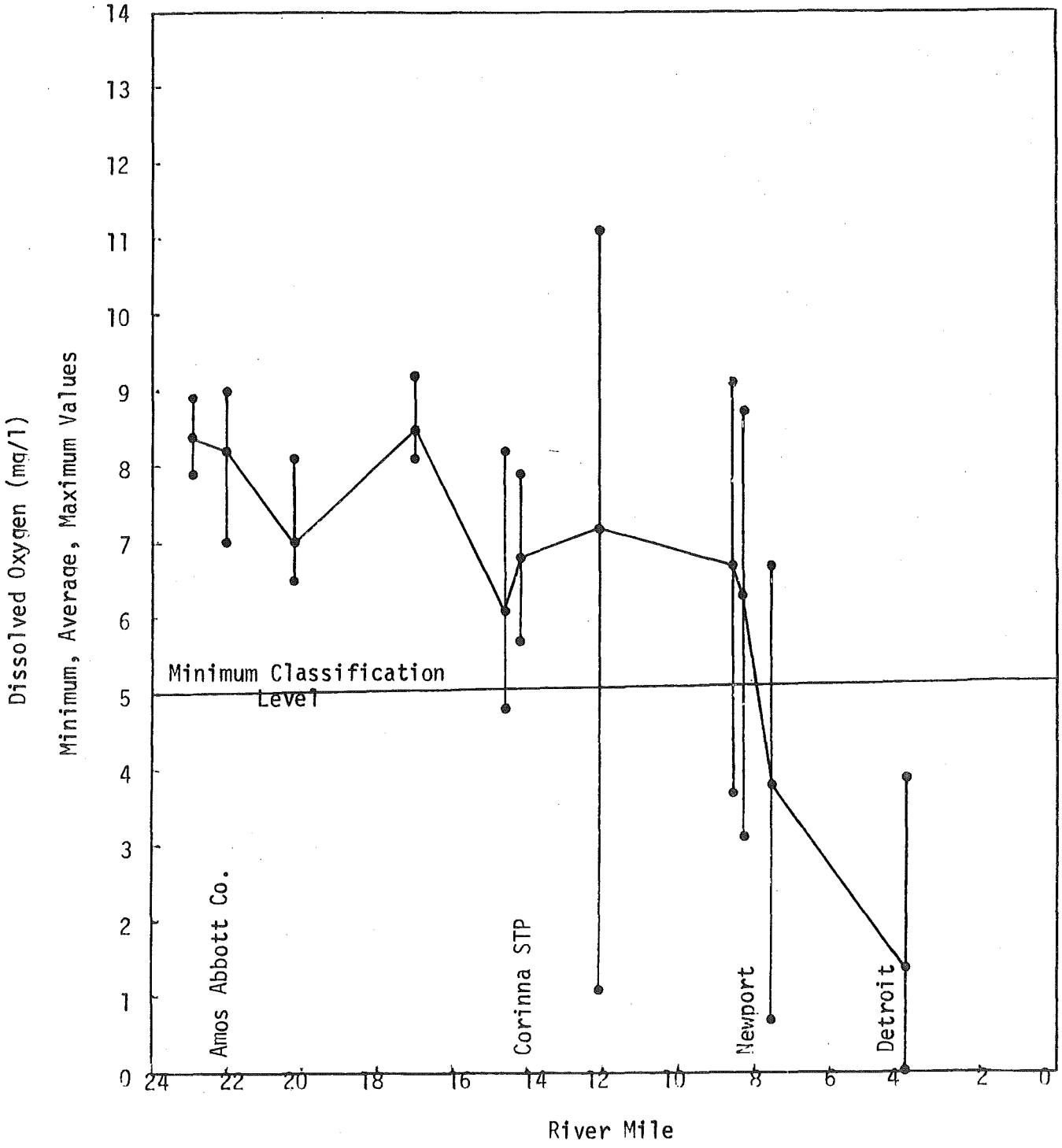
DEP, E.C. Jordan Co.

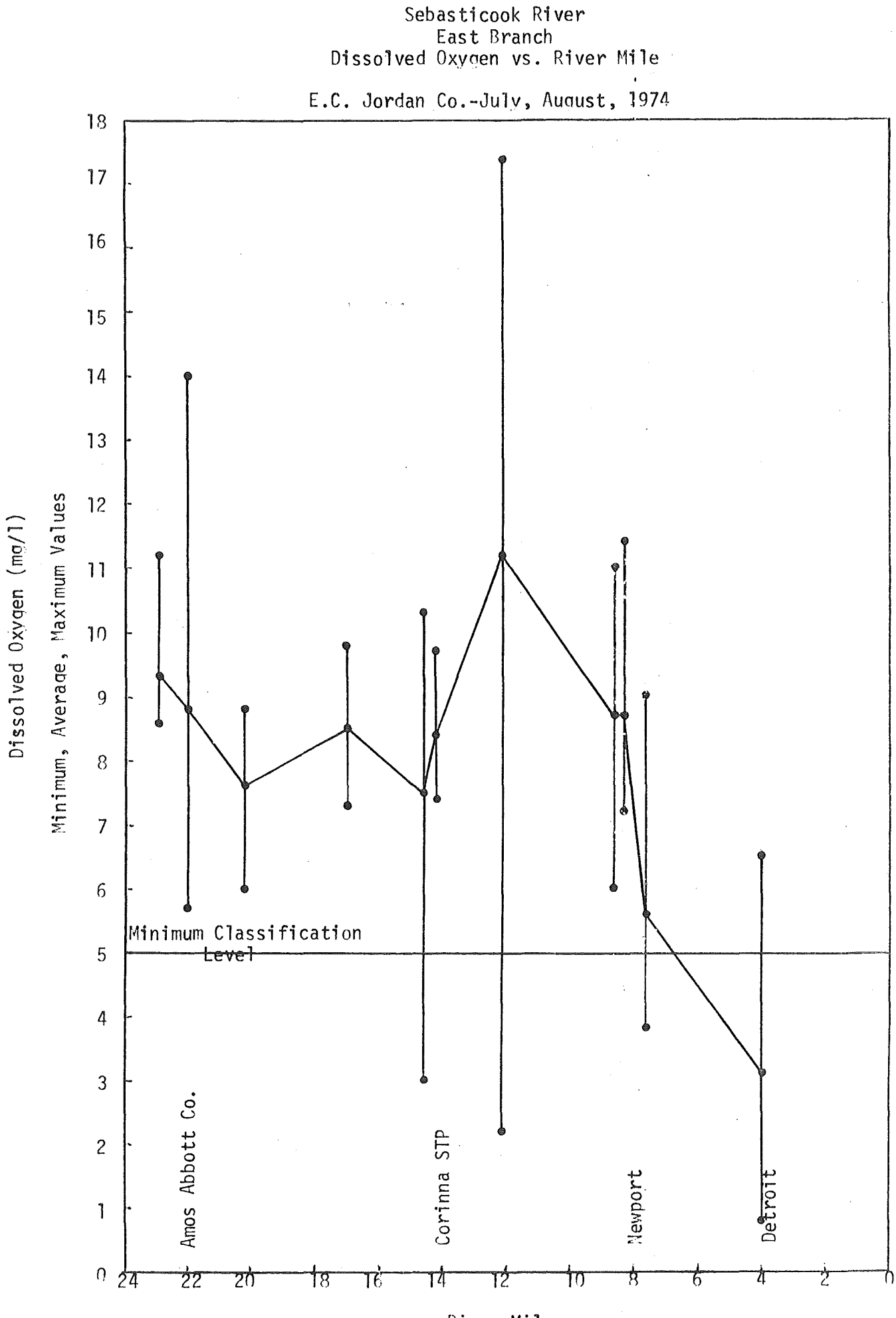


Sebasticook River
East Branch

Dissolved Oxygen vs. River Mile

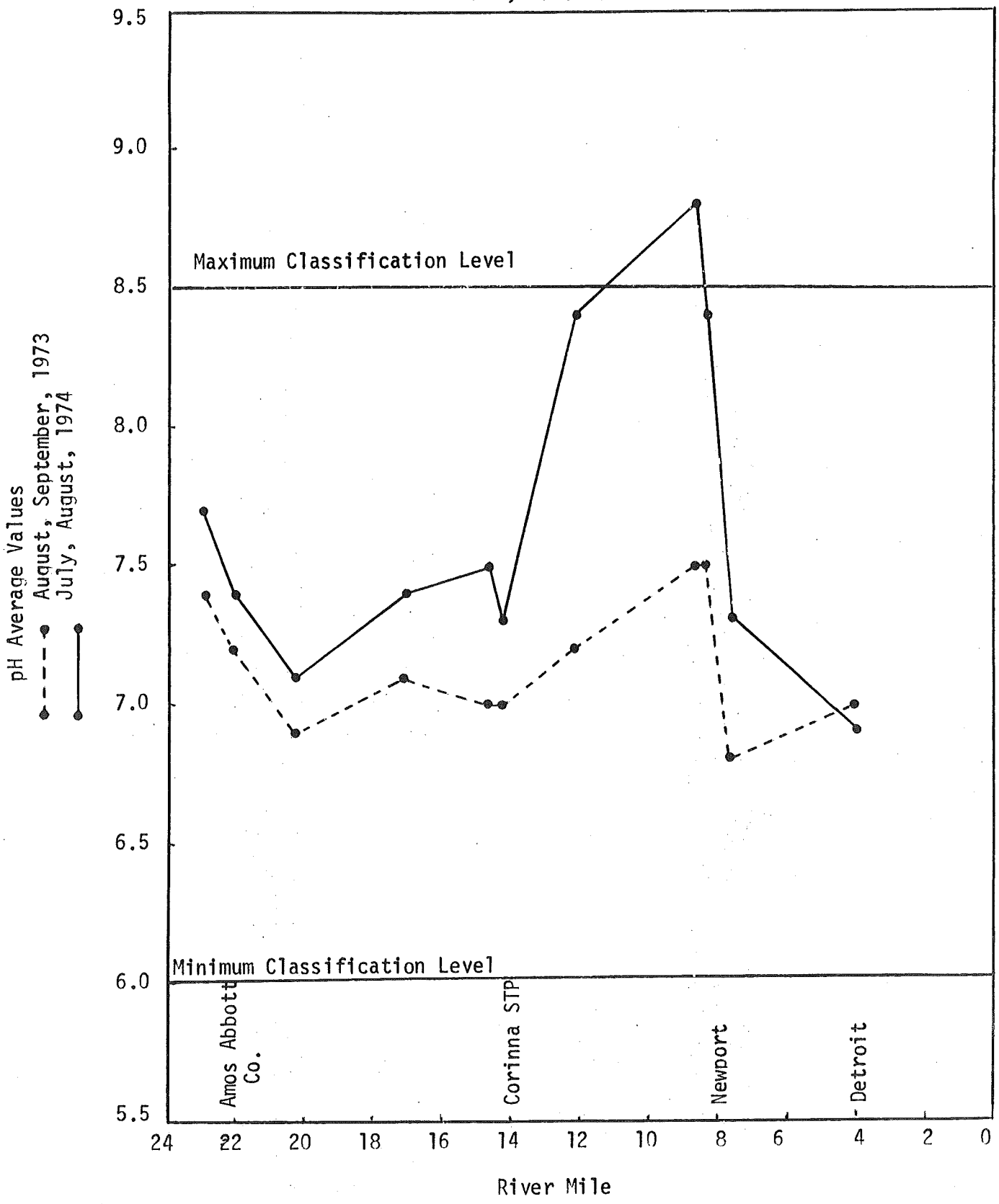
DEP-August, September, 1973




Sebasticook River
East Branch
Dissolved Oxygen vs. River Mile
E.C. Jordan Co.-July, August, 1974
Dissolved Oxygen (mg/l)
Minimum, Average, Maximum Values
Minimum Classification Level
Amos Abbott Co.
Corinna STP
Newport
Detroit
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
24
22
20
18
16
14
12
10
8
6
4
2
0

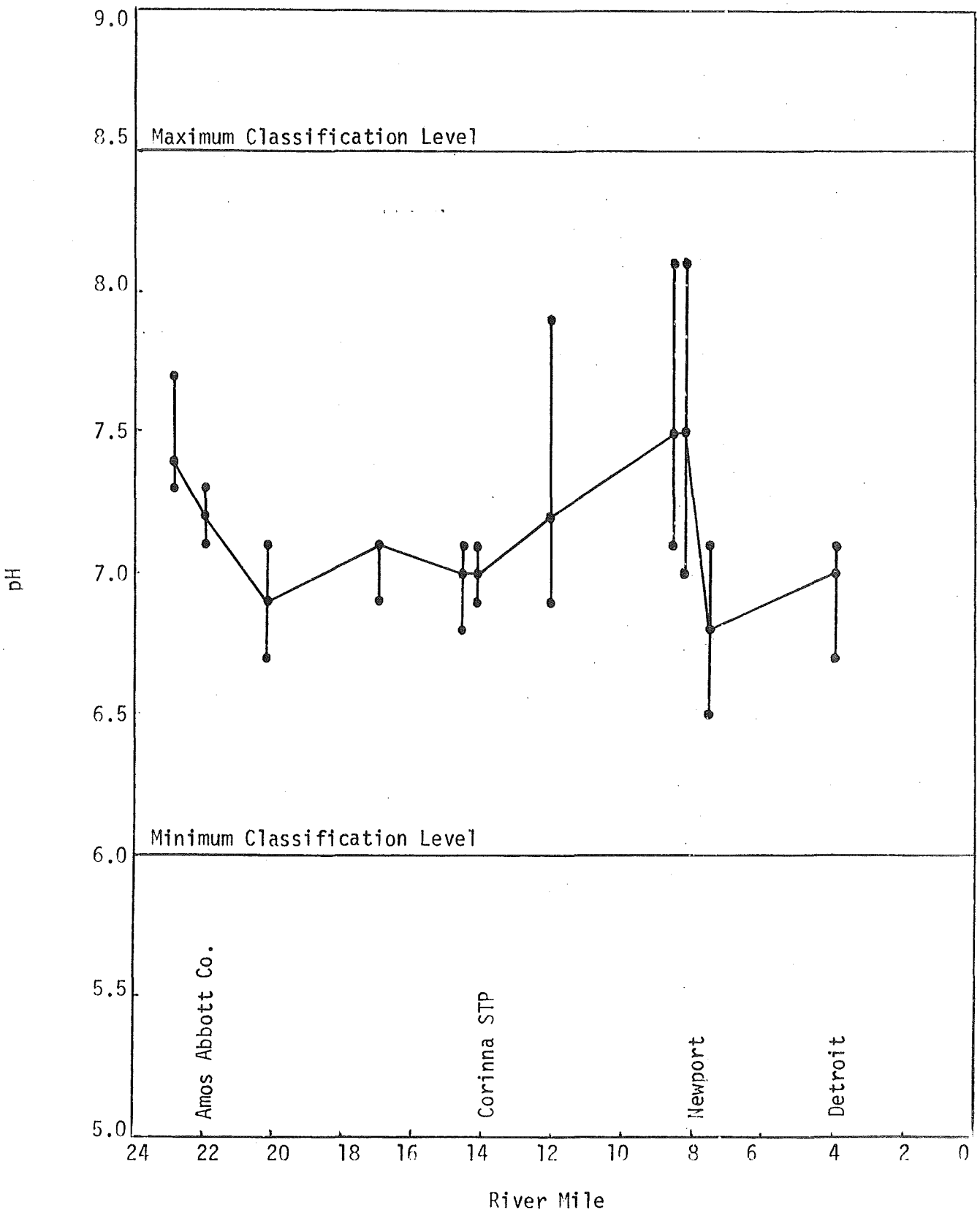
Sebasticook River
East Branch
pH vs. River Mile

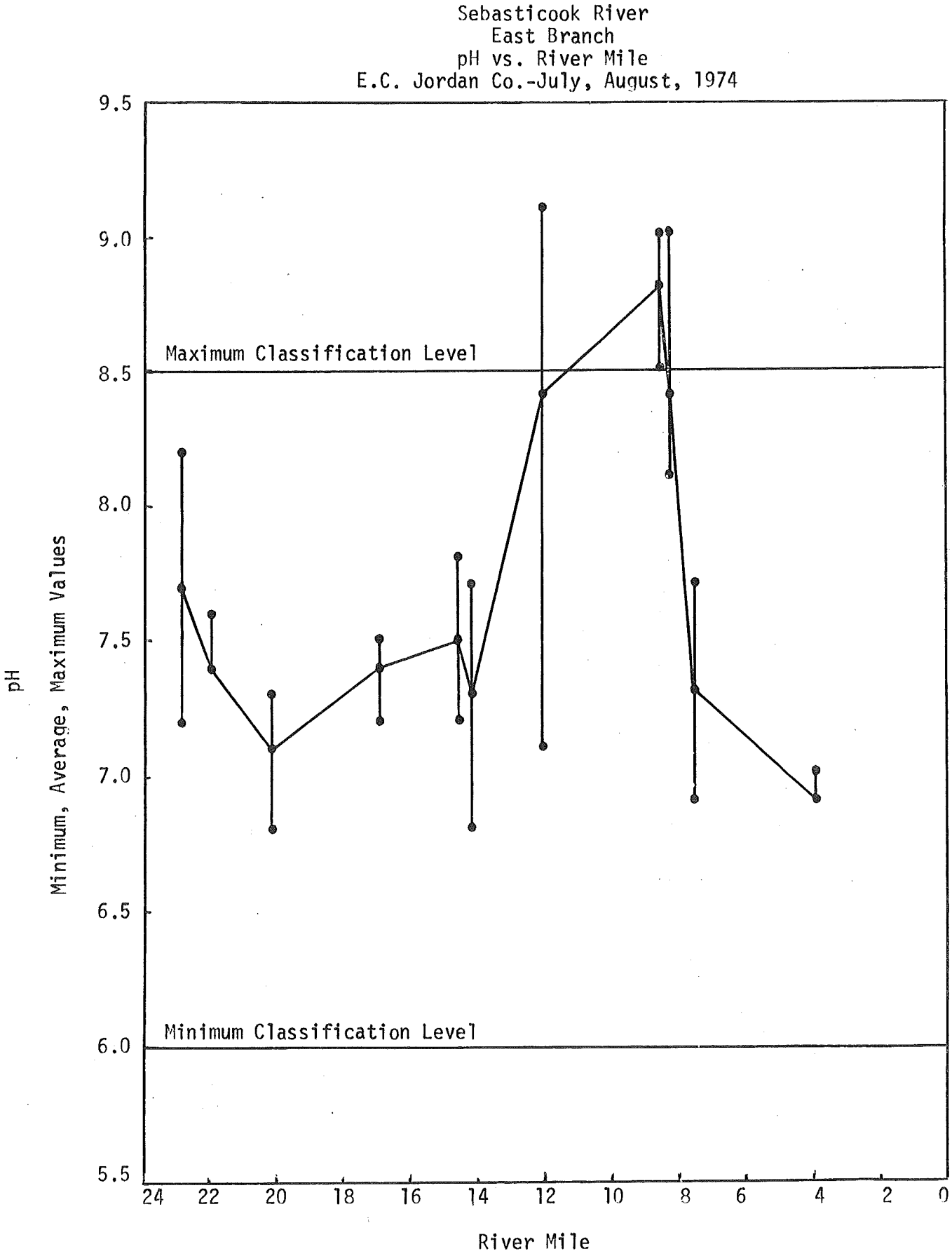
DEP, E.C. Jordan Co.



Sebasticook River
East Branch
pH vs. River Mile

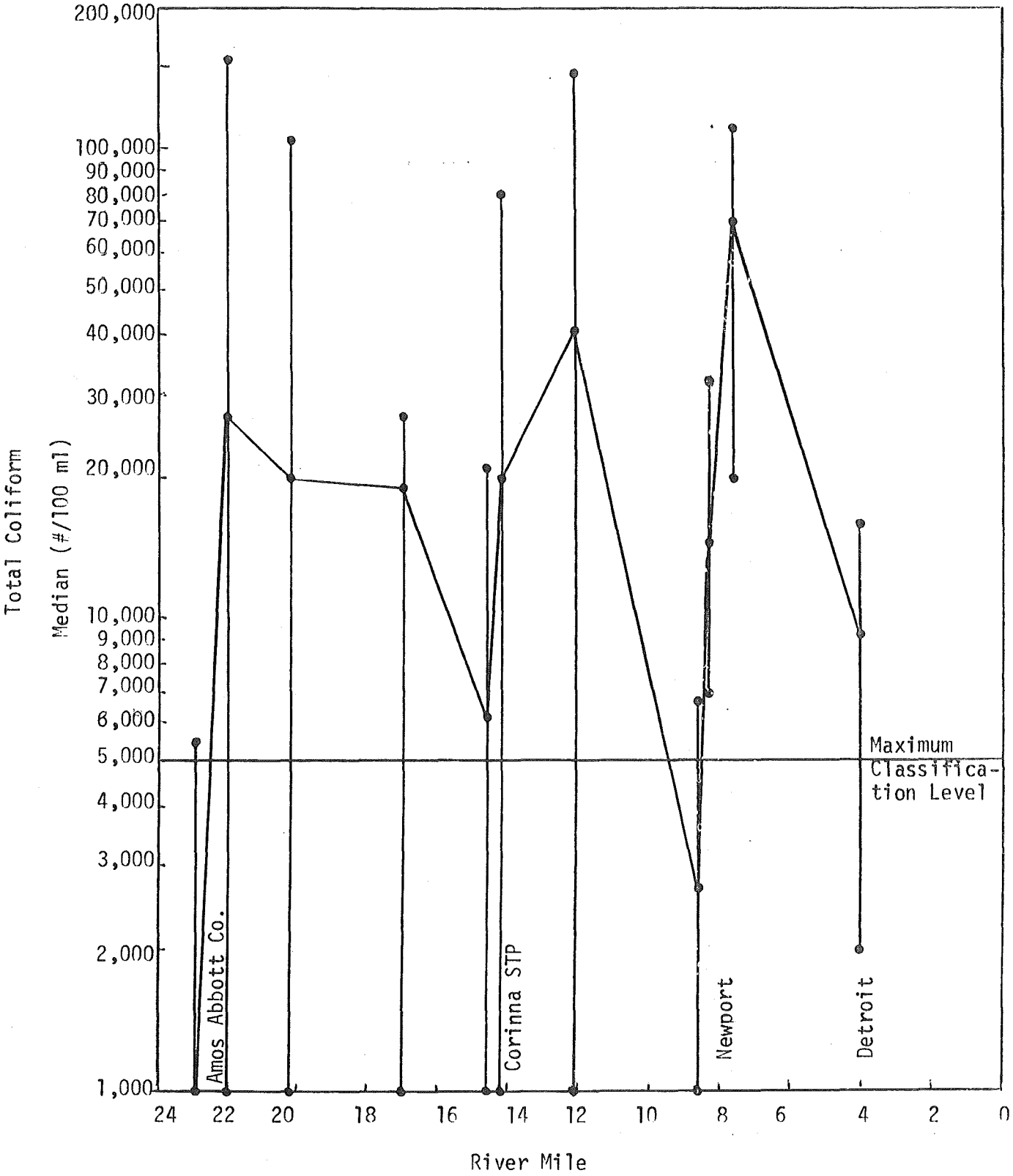
DEP-August, September, 1973




Sebasticook River
East Branch
pH vs. River Mile
E.C. Jordan Co.-July, August, 1974
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
Maximum Classification Level
Minimum Classification Level
pH
Minimum, Average, Maximum Values
24
22
20
18
16
14
12
10
8
6
4
2
0
River Mile

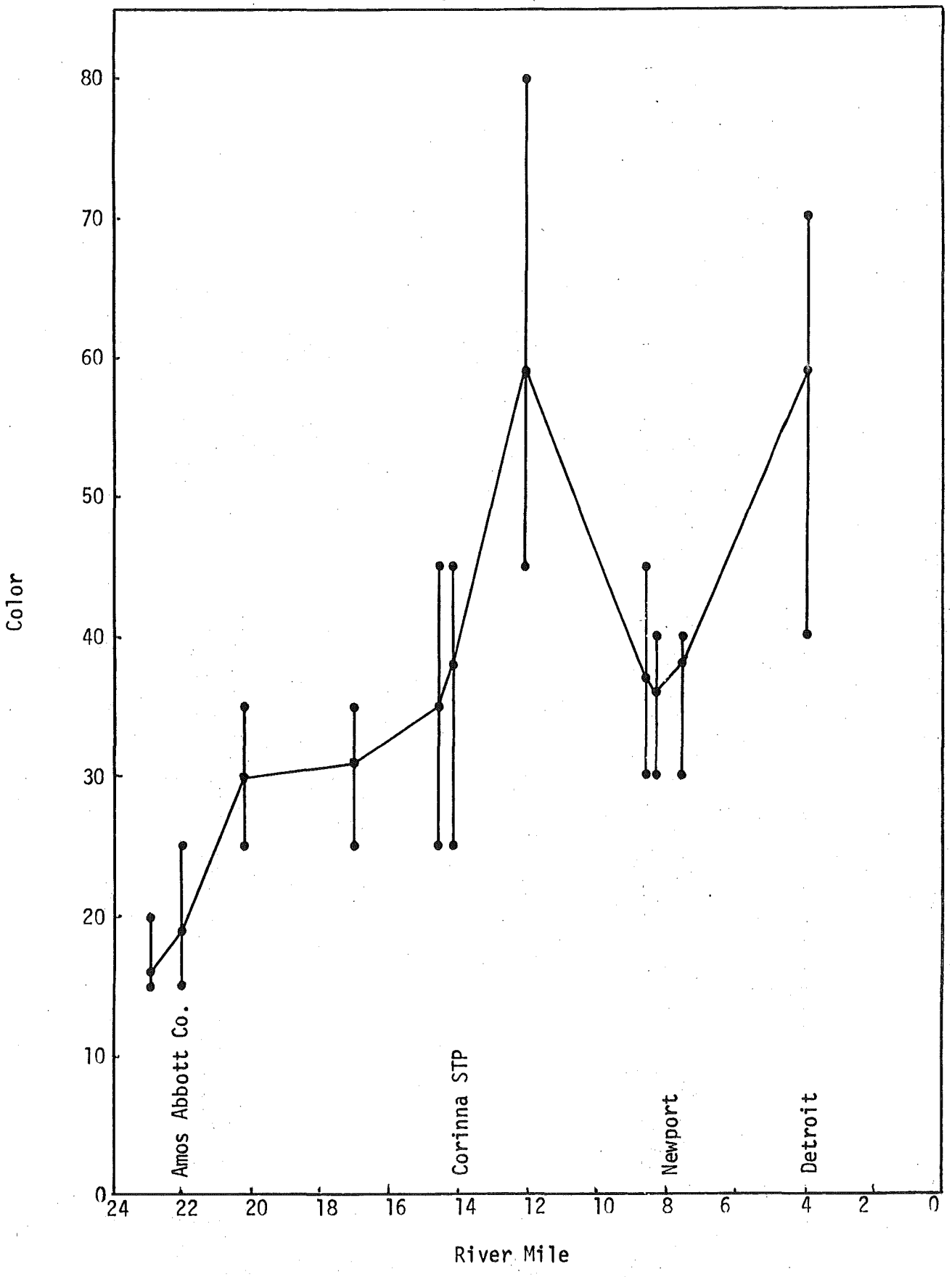
Sebasticook River
East Branch
Total Coliform Bacteria vs. River Mile

DEP-August, Sentember, 1973



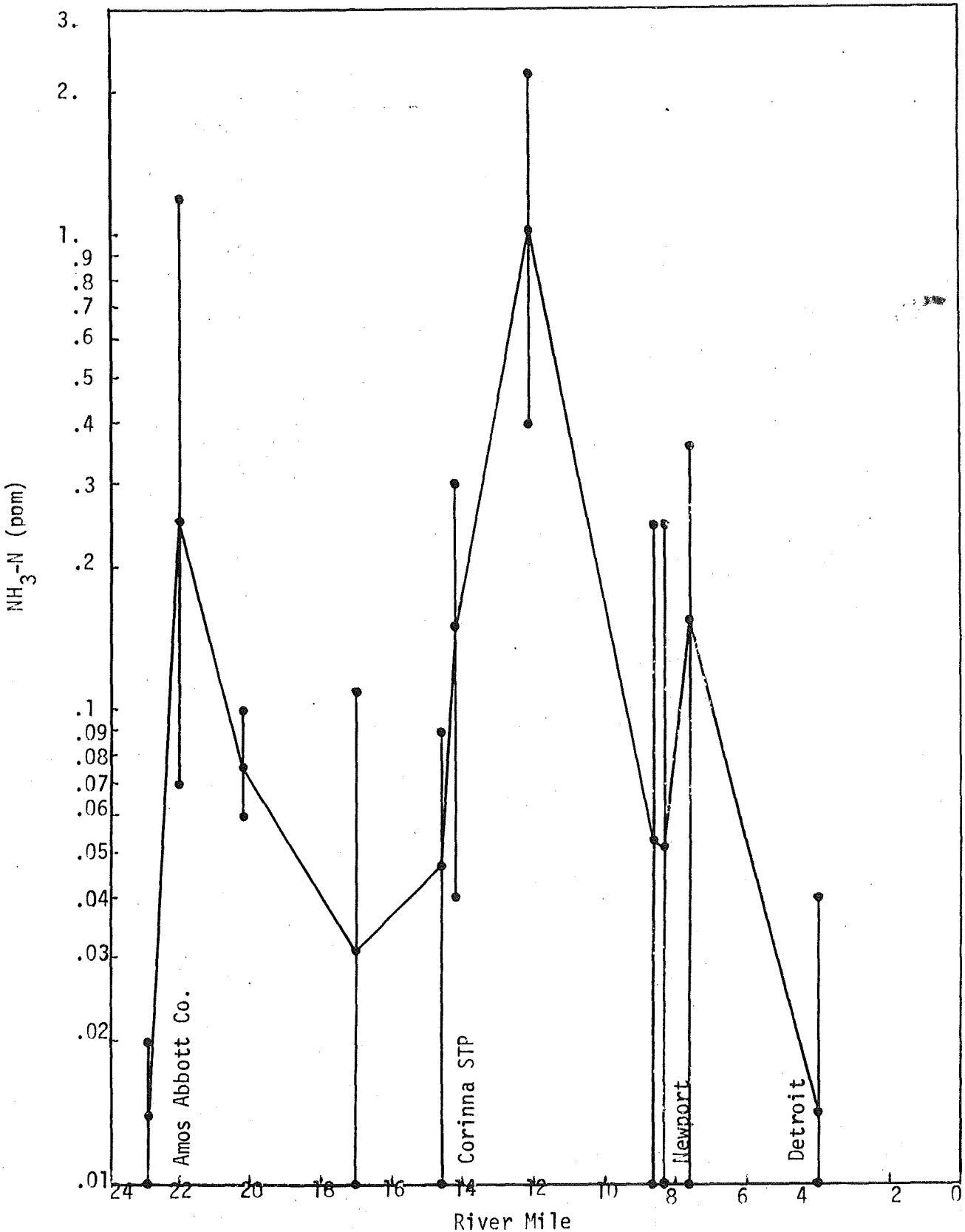
Sebasticook River
East Branch
Color vs. River Mile

DEP-August, September, 1973



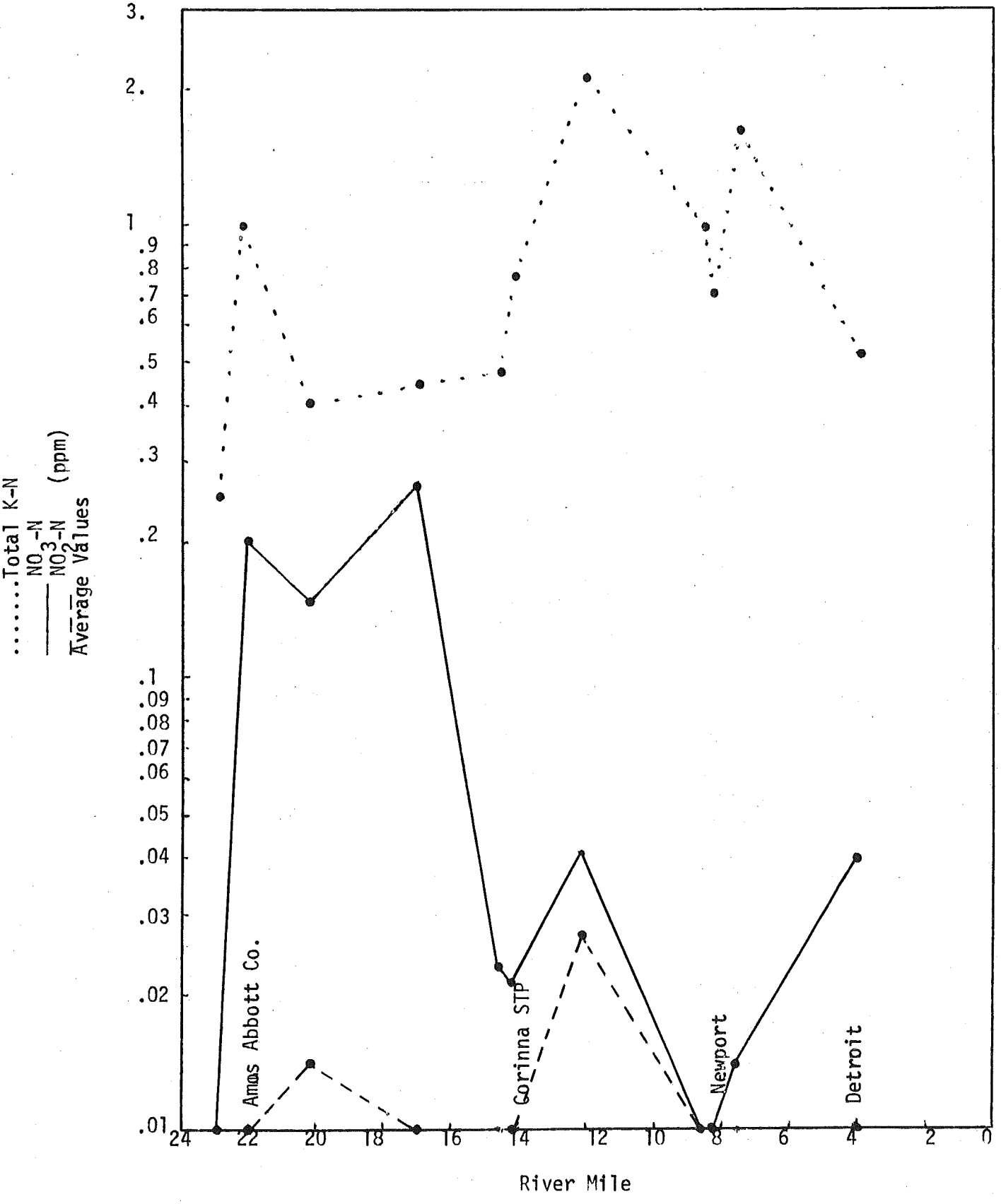
Sebasticook River
East Branch
NH_3-N vs. River Mile

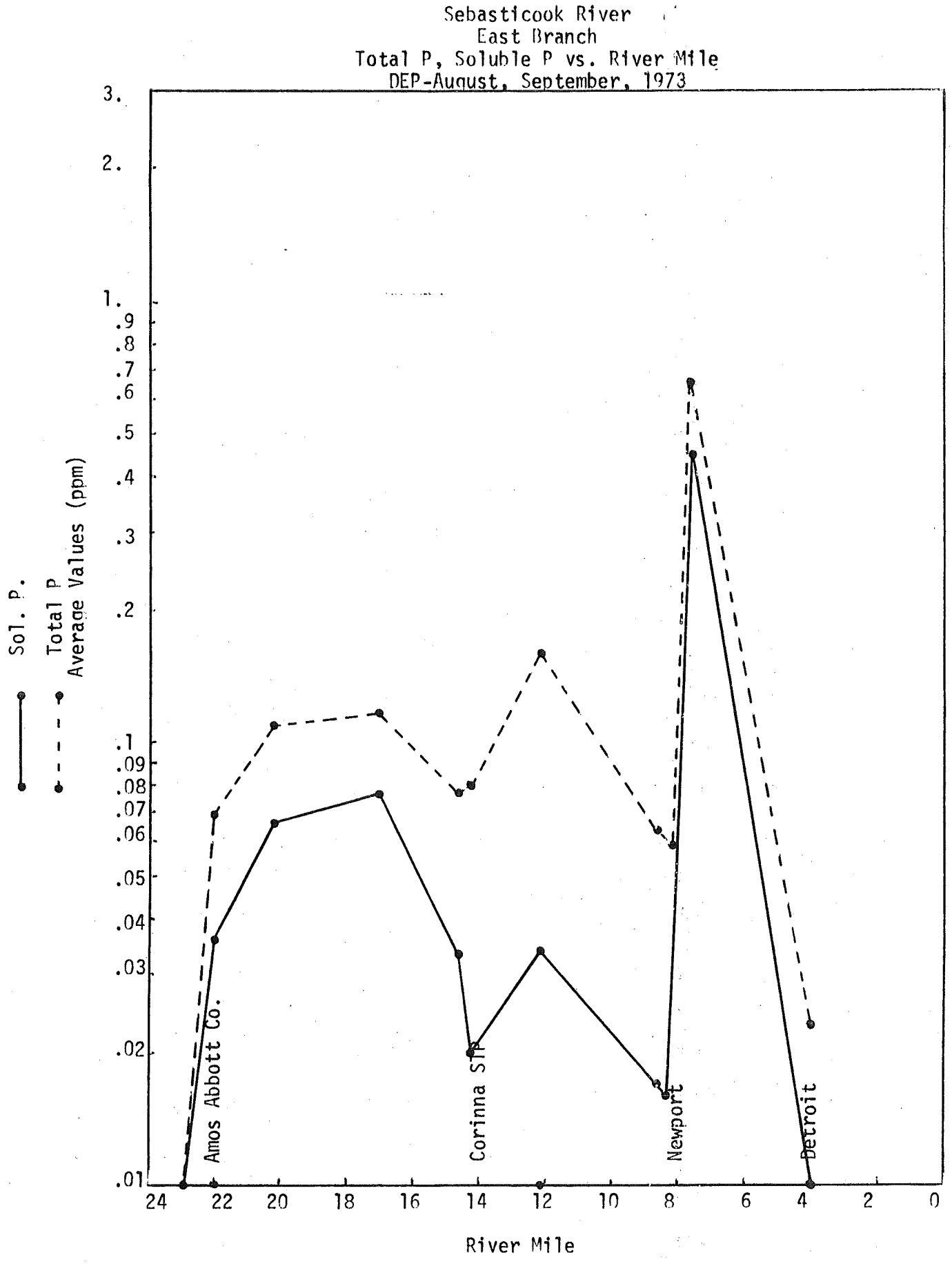
DEP-August, September, 1973

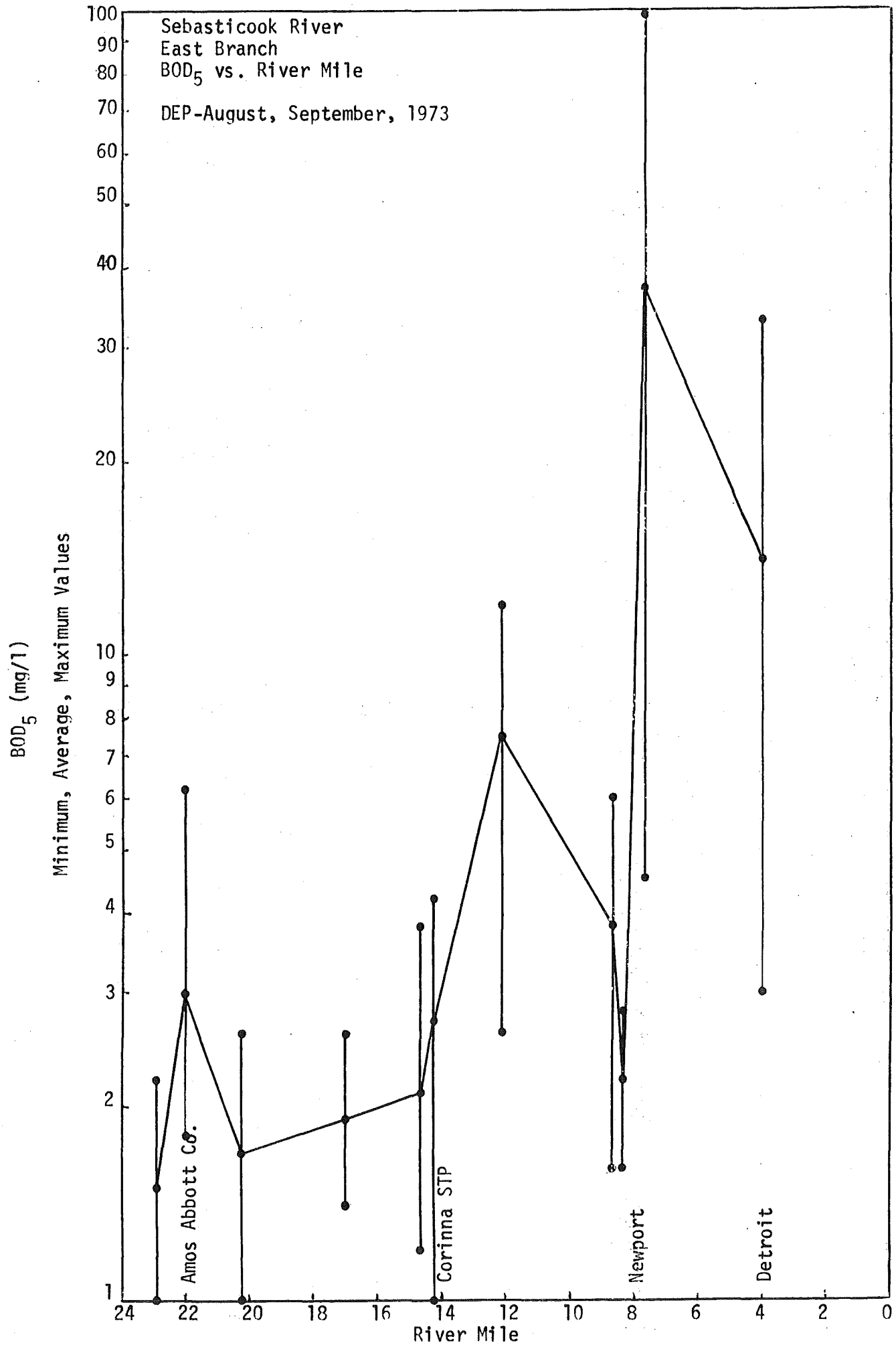


Sebasticook River
East Branch
NO_3-N, NO_2-N, Total K-N vs. River Mile

DEP-August, September, 1973

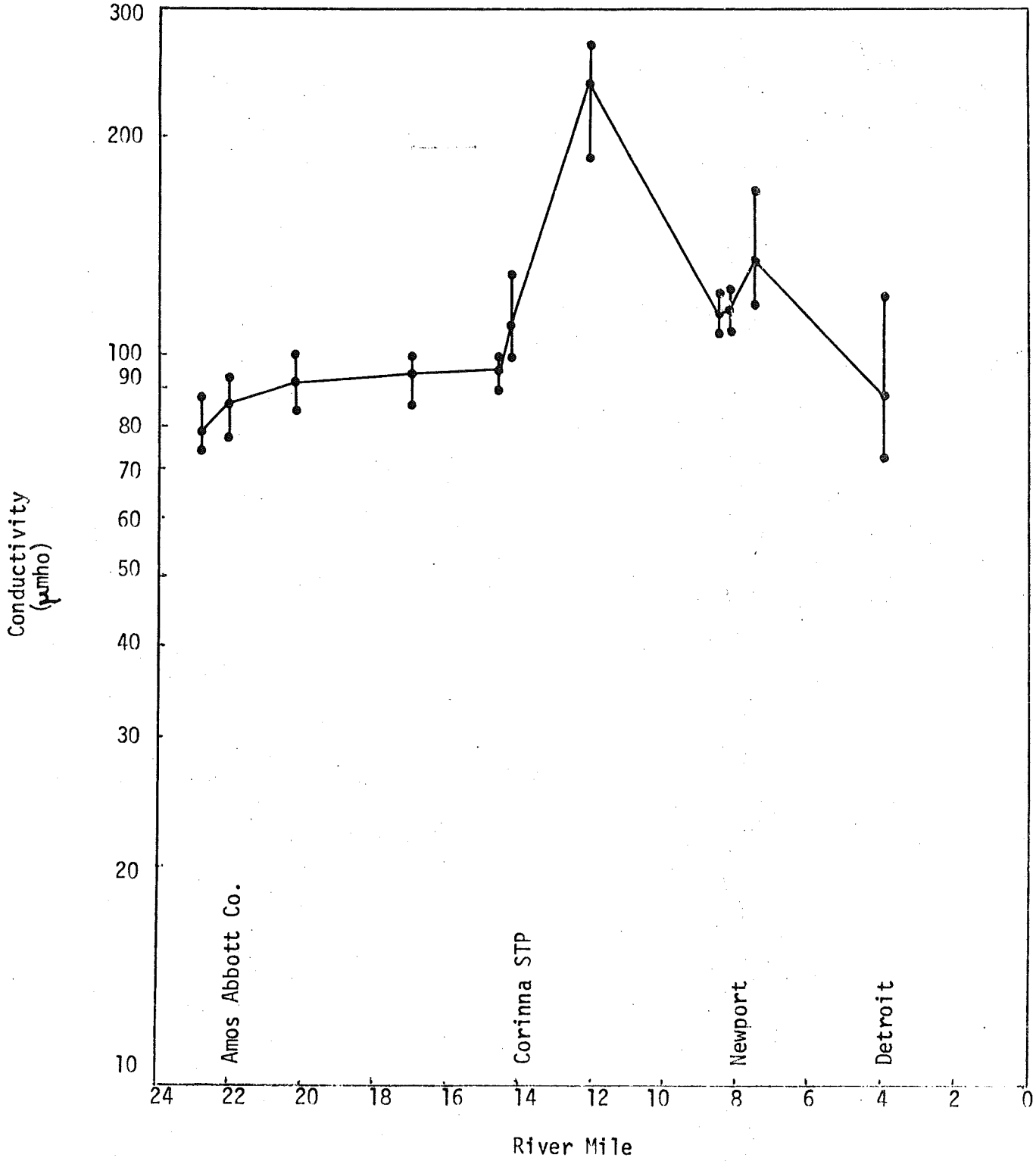



Sebasticook River
East Branch
Total P, Soluble P vs. River Mile
DEP-August, September, 1973
Sol. P.
Total P
Average Values (ppm)
3.
2.
1.
.9
.8
.7
.6
.5
.4
.3
.2
.1
.09
.08
.07
.06
.05
.04
.03
.02
.01
Amos Abbott Co.
Corinna STP
Newport
Detroit
24
22
20
18
16
14
12
10
8
6
4
2
0
River Mile

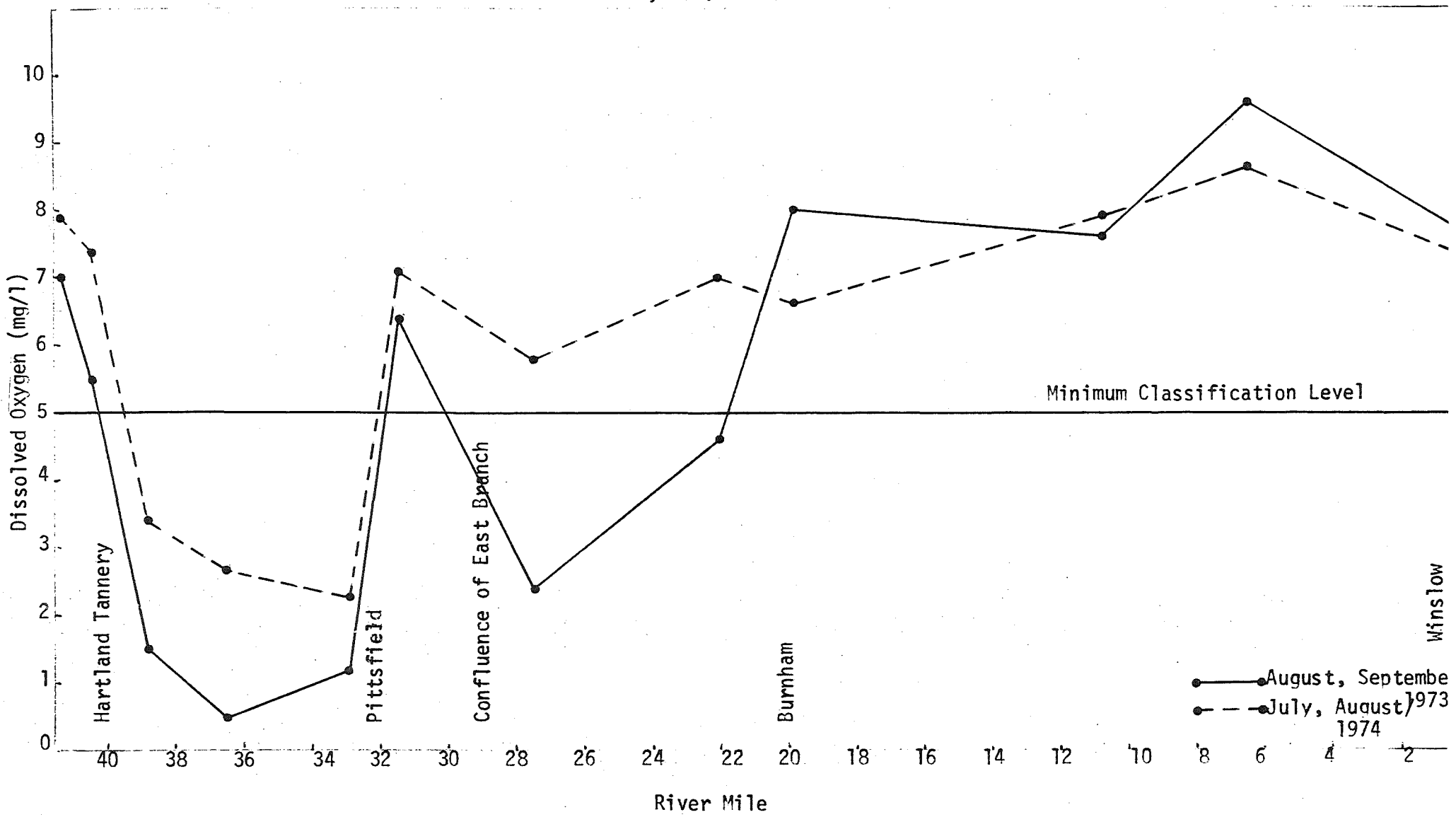

Sebasticook River
East Branch
BOD5 vs. River Mile
DEP-August, September, 1973
BOD5 (mg/l)
Minimum, Average, Maximum Values
100
90
80
70
60
50
40
30
20
10
9
8
7
6
5
4
3
2
1
24
22
20
18
16
14
12
10
8
6
4
2
0
River Mile
Amos Abbott Co.
Corinna STP
Newport
Detroit

Sebasticook River
East Branch
Conductivity vs. River Mile

DEP-August, September, 1973

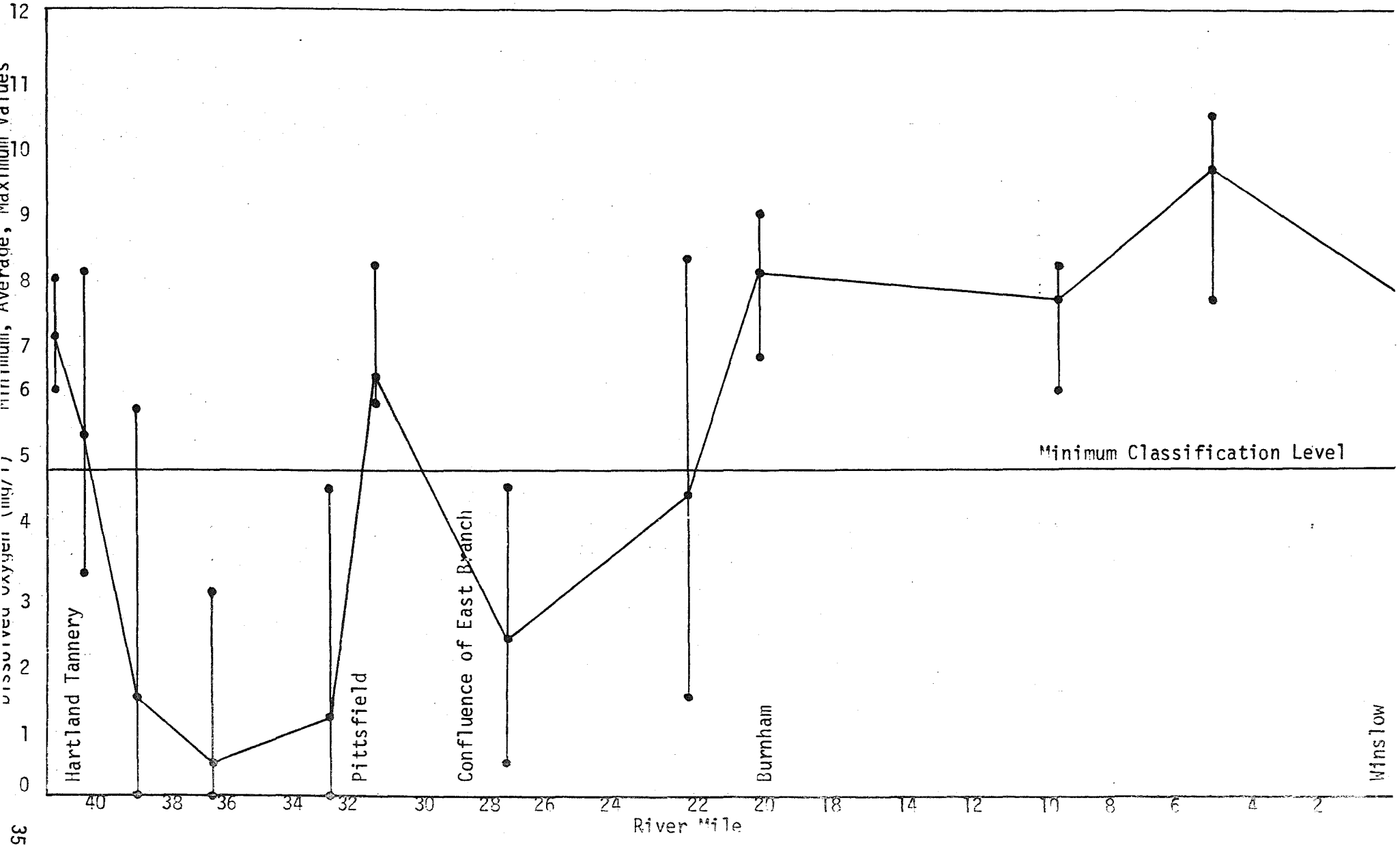


Sebasticook River
Main Stem
1973 Average D.O., 1974 Average D.O. vs. River Mile
DEP, E.C. Jordan Co.



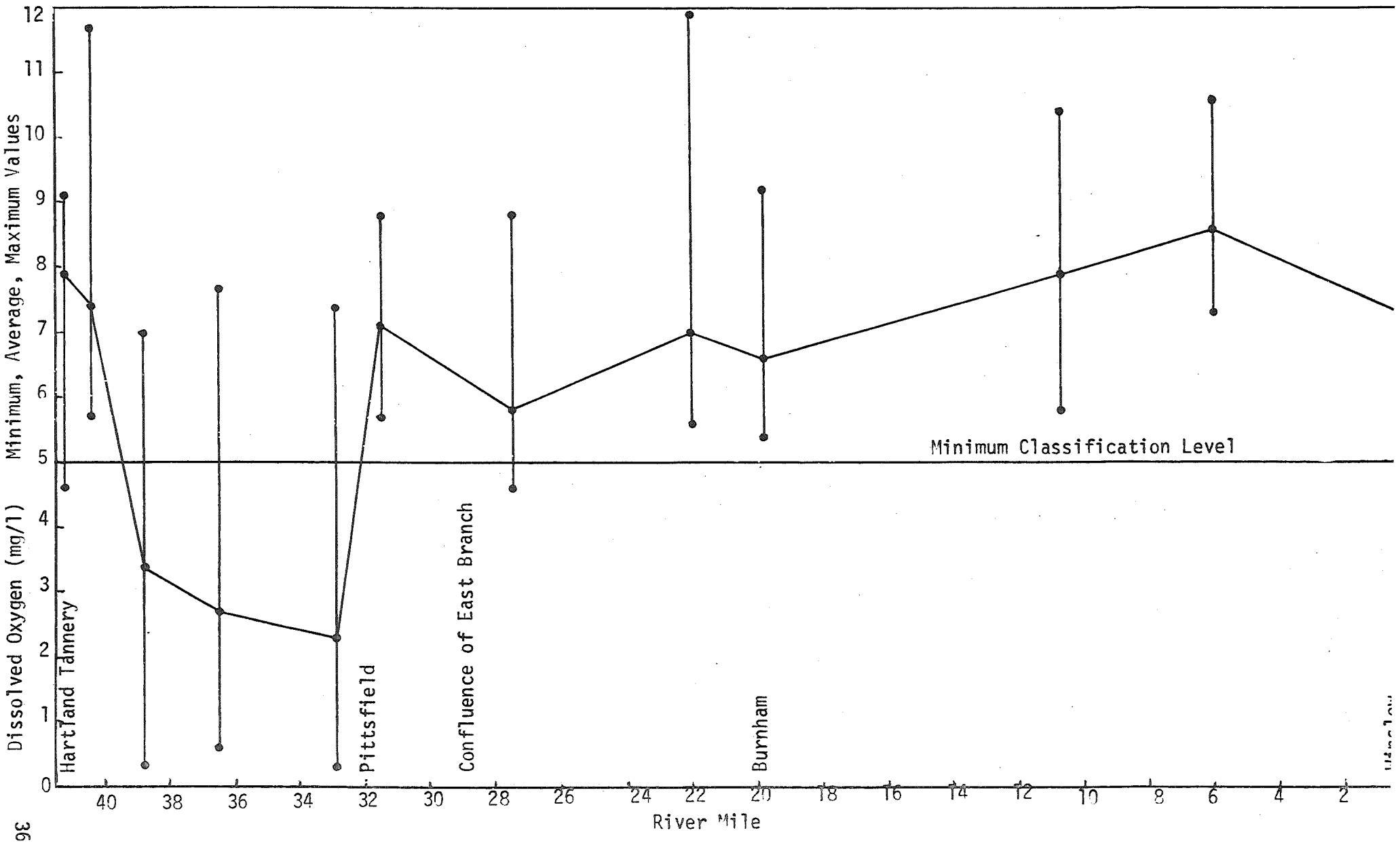
Sebasticook River
Main Stem
Dissolved Oxygen vs. River Mile

DEP-August, September, 1973



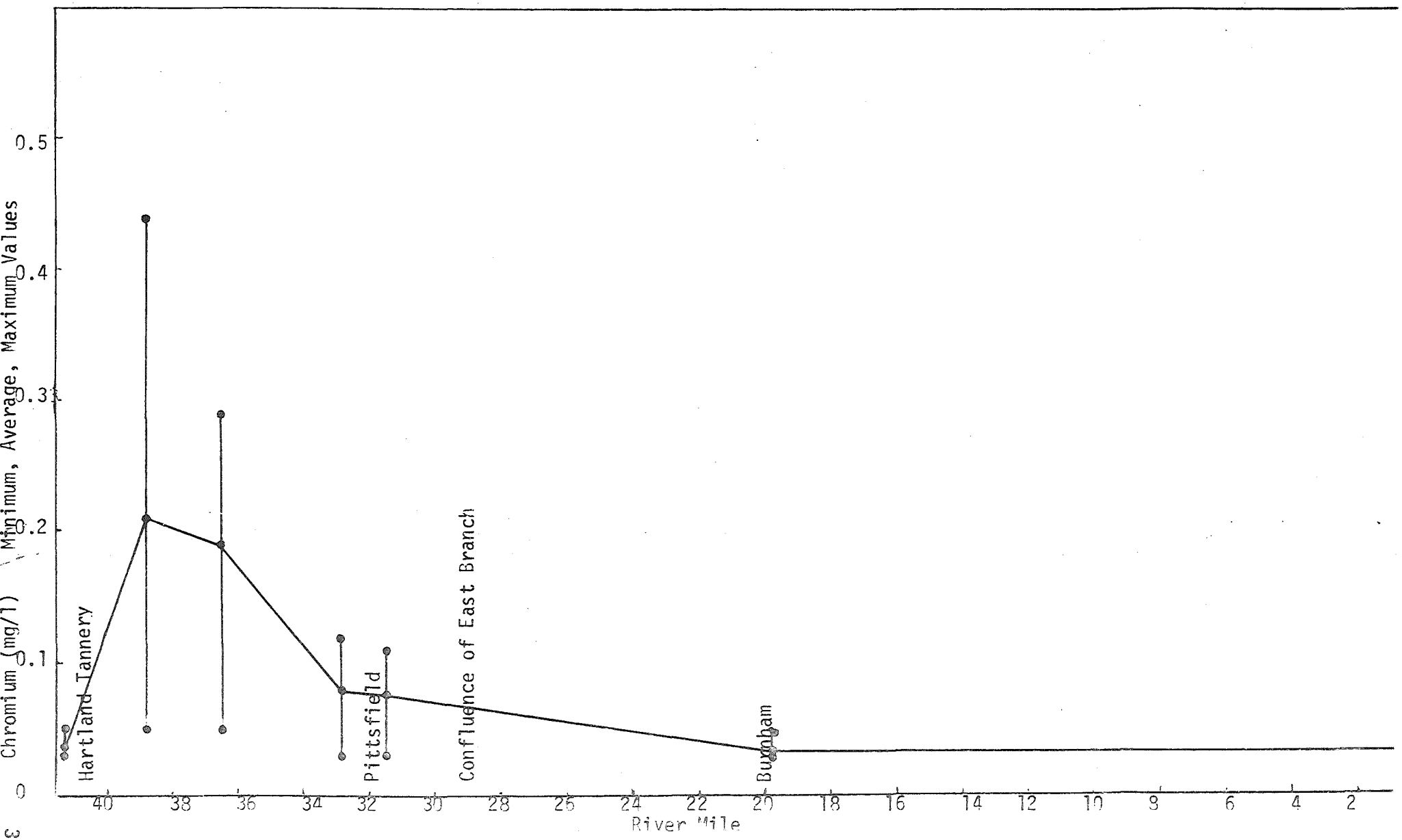
Sebasticook River
Main Stem
Dissolved Oxygen vs. River Mile

E.C. Jordan Co.-July, August, 1974

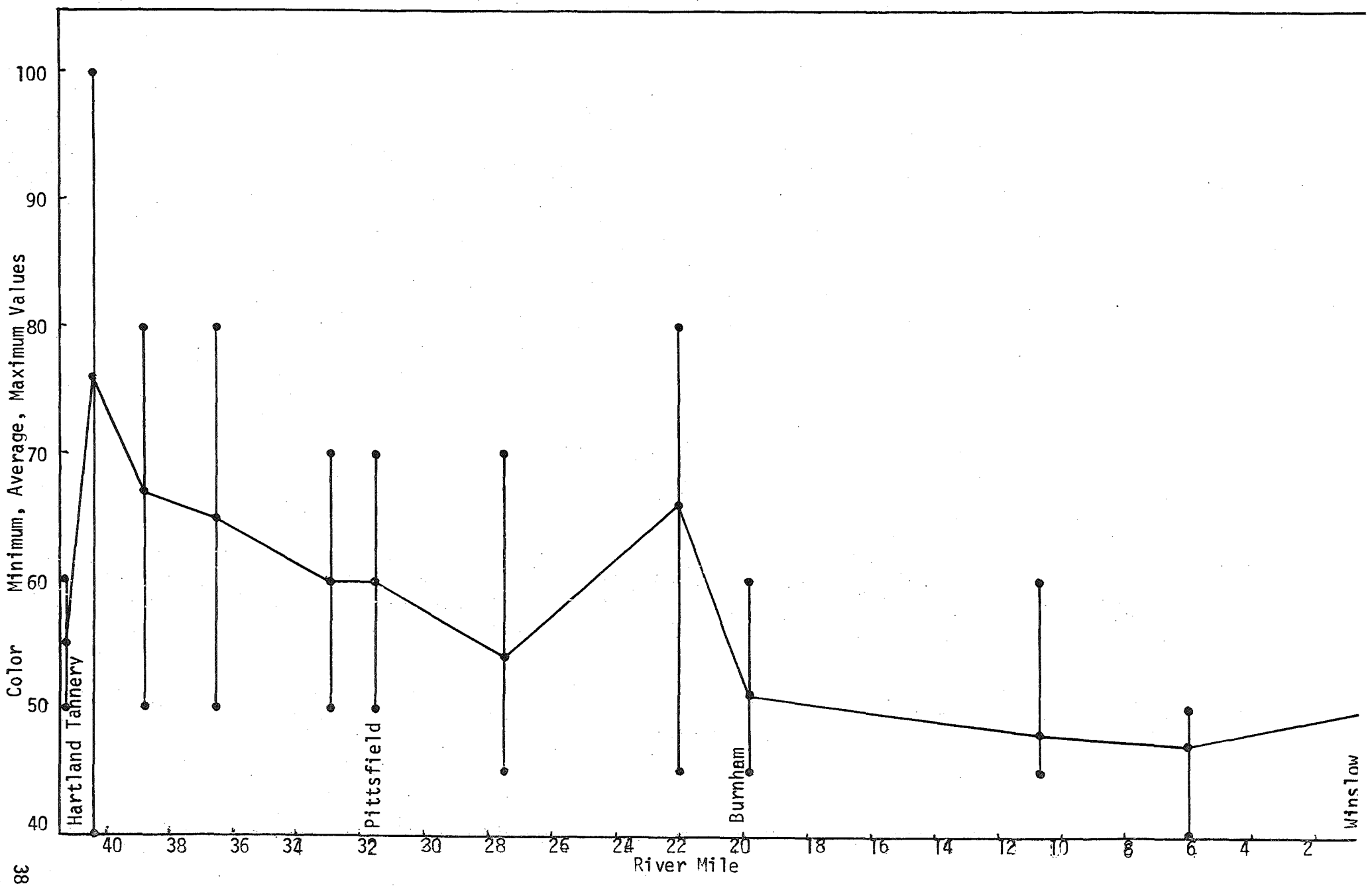


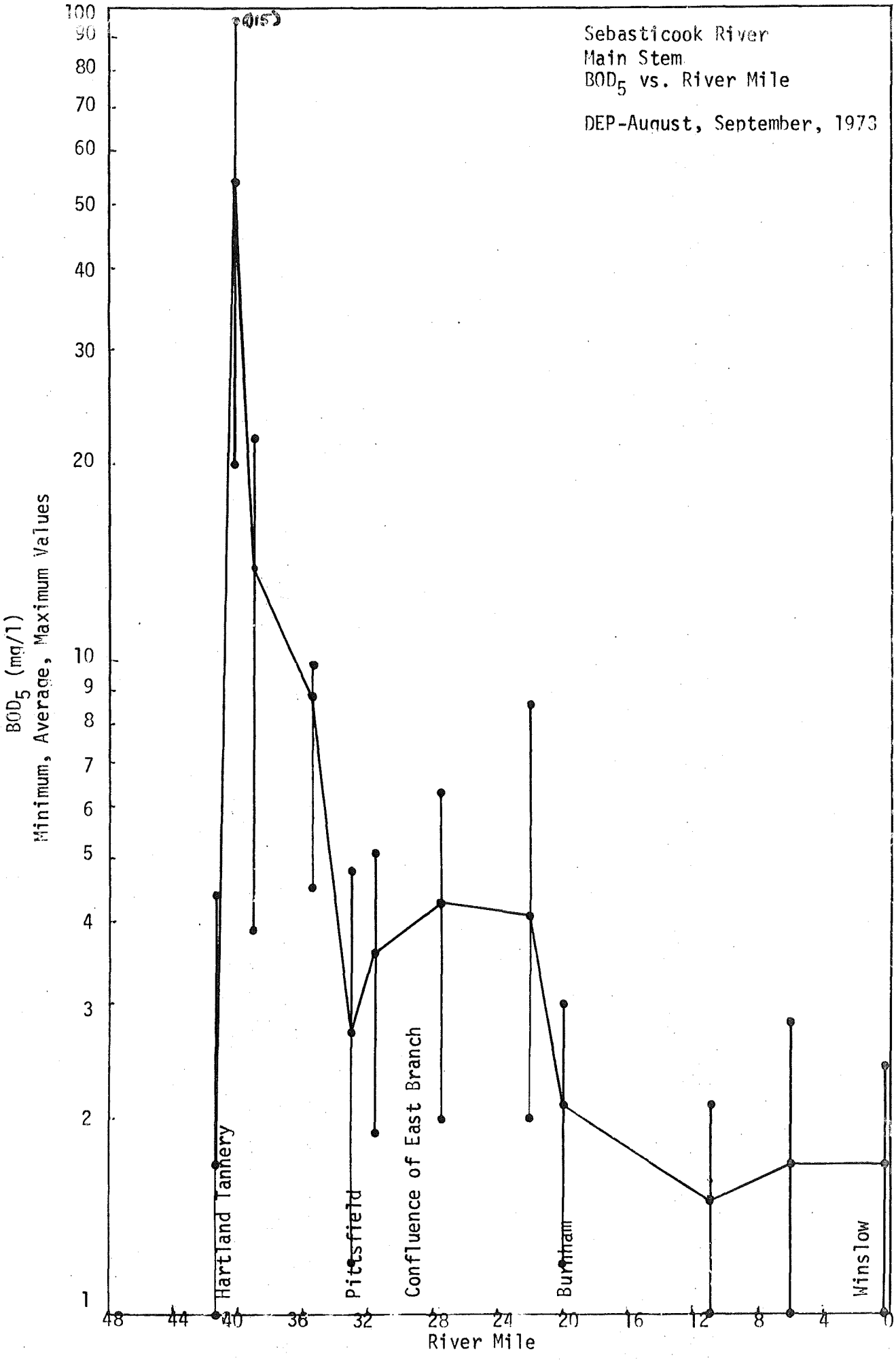
Sebasticook River
Main Stem
Chromium vs. River Mile

DEP-August, September, 1973



Sebasticook River
Main Stem
Color vs. River Mile
DEP-August, September, 1973




Sebasticook River
Main Stem
BOD5 vs. River Mile
DEP-August, September, 1973
BOD5 (mg/l)
Minimum, Average, Maximum Values
River Mile
Hartland Tannery
Pittsfield
Confluence of East Branch
Burnham
Winslow

December 12, 1974

Sebasticook River
Kennebec River Basin

BIOLOGICAL SURVEY OF THE

SEBASTICOOK RIVER - PRELIMINARY REPORT

A survey of the macroinvertebrates in the Sebasticook River was made August 22, 1973 due to its designation as a Water Quality Limited Segment. Samples were taken in both branches and the main stem above and below pollution sources and in the recovery zones below discharges. This report includes seven of the sites that have been analyzed to date.

WEST BRANCH

The only sample analyzed from a 'clean' section of the river is below the outlet dam of Great Moose Pond. This sample showed a very high diversity of organisms typically found in unpolluted, fast flowing waters in Maine. Using a Shannon-Weiner Diversity index, an index value of 3.11 was obtained at this station.* The organisms included several groups which require high water quality standards. The flatworm (Phagocata sp.), mayfly (Tricorythodes sp.), caddis flies (Cheumatopsyche sp. and Neureclipsis sp.), and pill clam (Sphaerium sp.) were the dominant genera. All of these demand high oxygen levels, low turbidity and are intolerant to most toxins. Production for one square foot was 271 organisms which is about typical for this time of the year in Maine waters.

The next sample on the West Branch was taken below the tannery at Hartford. This sample shows the tremendous degradation of the river from the tannery and town effluents. Virtually all forms of life have been eliminated. Sampling over a large area of the bottom produced only 143

*The Shannon-Weiner index is a means by which the structure of a community may be measured. Values >3.00 are typically found in unpolluted waters in Maine. Values >2.00 and <3.00 indicate possible effects of pollution or other population limiting factors. Values >1.00 and <2.00 indicate pollution sufficient to inhibit many of the intolerant organisms. Values <1.00 indicate severely polluted conditions where only a few organisms can live.

organisms mostly nematodes (roundworms) and the midge fly larvae (Endochironomus sp.). Both are tolerant forms of organisms which can withstand the oxygen depletion, solids and toxic chromium discharge. The diversity index was 0.97, one of the lowest values recorded in Maine waters.

A sample was also examined from the West Branch 7.7 miles downstream from Hartland below the Waverly Dam in Pittsfield. The river has recovered moderately at this point. Diversity is still suppressed (2.09), however this may be due to a high population of the pill clam (Sphaerium sp.). Dominant taxa include mollusks (pill clam and snails) and many Diptera (fly) larvae including both tolerant (midge fly) and intolerant (black fly) forms. The caddis fly and mayfly populations, which generally require the highest water quality are still suppressed. Production was 317 organisms per square foot.

EAST BRANCH

Three sites were selected on the East Branch for this report. A sample was taken at Lincoln Mills about 4 miles below the Town of Dexter. The invertebrate community showed very good diversity (2.80) and at this point is only marginally impaired by the industrial and domestic discharges at Dexter and nearby agricultural runoff. The community is dominated by the aquatic worm (Nais communis) which might indicate the river is nutrient rich from domestic wastes. Many different taxa exist, however, indicating the generally good water quality. Production was 347 organisms per square foot.

The invertebrate community below the Corinna Sewage Treatment Plant is indicative of the severe degradation of the river caused by the treatment plant and woolen mill discharges. Diversity is very poor (0.83). Seven taxa were collected however only the aquatic worms (Oligochacta) dominate. Production was so great that only a very small subsample was needed in order to do the diversity index. Production is probably in the thousands of worms per square foot. This population is supported by the tremendous

organic load discharged. Oxygen depletion, chlorine residuals and solids (dissolved and suspended) have eliminated all but the most tolerant organisms.

The biocommunity below Newport is similarly affected by the organic discharges from domestic sewage and a dairy effluent. This area is again dominated by aquatic worms (Oligochaeta) which exist in the thousands per square foot. The substrate here is covered with filamentous bacteria which makes it unsuitable for most organisms. Oxygen is also depleted in this area making it uninhabitable. Diversity was very poor (1.33) indicating only a few tolerant forms making up the population.

MAIN STEM

One site was selected at the old CMP dam in Burnham, 6.5 miles below the confluence of the two branches. No significant discharges occur between the confluence of the two branches and the dam. The river shows good recovery at this point. Diversity is 2.59 and the community is largely made up of caddis flies, mayflies and Diptera larvae. Fourteen taxa are represented among the 336 organisms.

The two branches of the Sebasticook show severe degradation over significant stretches. This is due to major pollution sources at Hartland, Corinna and Newport. Other sources occur at Dexter and Pittsfield. Below the confluence of the two branches, the river shows some improvement since there are no significant pollution sources in this area. The pollution loads further up the river continue to influence the quality far downstream particularly in the area of impoundments where oxygen depletions can occur during the warm months.

David Courtemanch
Biologist

DC/gm

IV. Abatement

A. Waste Sources

The Sebasticook River Basin contains a comparatively large number of industrial and municipal waste sources in relation to the small flows of its streams. At the present time, there are only two completed treatment facilities, a municipal lagoon system for the Town of Unity on Twenty-five Mile Stream, and a joint industrial-municipal facility at Corinna on the East Branch which treats the wastes from Eastland Woolen Mill and the Town. The Corinna facility has operational difficulties and requires additional refinement. The major waste sources and the existing loads are tabulated following the individual municipal waste source division.

The following communities, including their industrial wastes, are considered to be priority problems and each are in need of a facilities plan; Dexter, Corinna, Pittsfield, and Clinton. Hartland and Winslow have received construction grants from the DEP and EPA and have started facility construction. Newport recently completed its facilities plan. Pittsfield was placed highly on the DEP FY 76 construction grant list and will conduct groundbreaking for its facility in July, 1976.

Load allocations were developed for some of the stream segments due to the severe water quality problems which exist. As stated previously, this poor quality warranted the designation of Water Quality Segments for most of the Main Stem and for all of the East Branch.

Discussions are presented on the following pages of the major communities in the Sebasticook Drainage in terms of their waste abatement programs.

Hartland

Hartland is located on the Main Stem of the Sebasticook River at approximately River Mile 40 just below Great Moose Pond. Hartland Tanning, a Division of Irving Tanning, is the community's chief industry and the largest single source of waste

Source	Receiving Body	Existing* Treatment	Existing Waste Load
Hartland	Sebasticook River	UC	180 lb/day BOD_5 180 lb/day S.S.
Irving Tanning	Sebasticook River	with Hartland	17,700 lb/day BOD_5 24,710 lb/day S.S. 2,500 lb/day Chromium 1,000 lb/day oil and grease
Pittsfield	Sebasticook River	0	980 lb/day BOD_5 980 lb/day S.S.
Edwards Corp.	Sebasticook River	0	33.4 lb/day S.S. 0.27 lb/day Cyanide 26.7 lb/day Chromium
Clinton	Sebasticook River	0	150 lb/day BOD_5 150 lb/day S.S.
Winslow	Sebasticook River	UC	Direct discharge to the Sebasticook will be intercepted to the Kennebec after secondary treatment at Waterville
Dexter	East Branch	0	540 lb/day BOD_5 490 lb/day S.S.
Amos Abbott	East Branch	0	600 lb/day BOD_5 600 lb/day S.S.
Dexter Shoe	East Branch	0	Sanitary waste included in Dexter, above
Fayscott Landis	East Branch	0	Sanitary waste included in Dexter, above
Corinna	East Branch	2	3,000 lb/day BOD_5 (domestic and industrial)
Eastland Woolen	East Branch	with Corinna	100 lb/day BOD_5 bypassed from above treatment facility
Newport	East Branch	0	300 lb/day BOD_5 300 lb/day S.S.
H.P. Hood	East Branch	0	8,300 lb/day BOD_5
Detroit	East Branch	0	No municipal sewers
Unity	Twenty Five Mile Stream	2	17 lb/day BOD_5 17 lb/day S.S.
Vassalboro	Outlet Stream	0	No municipal sewers
St. Albans	Indian Stream	0	No municipal sewers
Palmyra	Madawaska Brook	0	No municipal sewers
Plymouth	Martin Stream	0	No municipal sewers

* 0 - No treatment
2 - Secondary treatment
UC - under construction

in the entire Sebasticook Drainage. Both the tannery and the Town have developed plans to treat their wastes in a joint facility which is presently under construction. The operation of the proposed facility will greatly improve the quality of the Sebasticook which is presently of very poor quality due to the tannery's historically untreated process water discharges.

The present classification of the Sebasticook below Hartland is C. It is unlikely that the River could maintain a higher classification in the near future since the load allocation for the C classification in itself was quite restrictive. For more information on the allocation, see Section B, Load Allocations.

Pittsfield

The Town of Pittsfield is located on the Main Stem of the Sebasticook River just above the confluence of the East Branch. The wastes of the Town are mainly domestic although the Edwards Co. discharges a number of heavy metals, (see table following this section). The Town had initial plans to build a lagoon system for its wastes and those at the Edwards Co. after appropriate pre-treatment. Presently, however, the Edwards Co. is investigating both alternatives, a joint treatment operation as well as separate industrial/municipal facilities. Final Company decisions are pending. The Town was placed on the FY 76 construction grant list and construction is scheduled to commence in July, 1976.

The preliminary design of the proposed lagoons calls for a discharge into a marshy area where the natural vegetation would act as further treatment to the effluent prior to entering the Sebasticook River. The Division of Lakes and Biological Studies is performing a vegetation study of the area to determine the effort on both the vegetation and effluent quality. Background data has been gathered. Additional data will be collected after the treatment facility goes on-line, to provide the Division of Lakes and Biological Studies data to evaluate the effluent effects on the bog as well as the efficiency of polishing the effluent by the bog. See

Appendix III.

The Town presently discharges all its wastes untreated into the Sebasticook River at approximately River Mile 30 and into Farnham Brook which enters the Sebasticook at River Mile 25, both of which are Class C waters.

Dexter

Dexter is located at the headwaters of the East Branch just below Lake Wassookeag. The Town, along with its industries, presently discharge untreated wastes to the Class C River at approximately River Mile 22.

The Town has 22 points on the DEP Municipal Priority Point System, Appendix II, the highest in the drainage. A facilities plan will be developed in FY 77 for Dexter and Corinna, its neighbor to the south, for the development of alternatives for abatement considerations. An earlier preliminary plan recommended joint treatment of the Town's domestic wastes along with those of Amos-Abbott, a woolen mill, as well as the sanitary wastes from Dexter Shoe Co. and Fayscott-Landis machine shop.

Two reports concerning the eutrophication problem of Sebasticook Lake cited Dexter's wastes as representing a major fraction of the total point source phosphorus input into the lake. The load allocation once it is developed for the Dexter-Corinna area will take phosphorus into account as well as other constituents.

Corinna

Corinna is located on the East Branch approximately four miles above Sebasticook Lake. The Town, through the Corinnna Sewer District, operates a secondary treatment facility for its wastes and those of Eastland Woolen Mill, the Town's largest industry. Although the facility has been plagued by operational difficulties and requires additional work, the East Branch has improved slightly since its operation.

Corinna, along with Dexter, its northern neighbor, will be developing a facilities plan in FY 77. This plan, using the load allocation which will be developed for the area, will consider phosphorus removals in addition to organic wastes, as they pertain to Sebasticook Lake's eutrophication problem.

The facility presently discharges to the Class C East Branch.

Newport

Newport is located on the East Branch Sebasticook River below the outlet of Sebasticook Lake. The Town, and its industries, presently discharges untreated wastes to the Class C water although plans are being developed for joint treatment with the Town and H.P. Hood Inc., a dairy processor.

The present discharges of wastes degrade the waters of the East Branch to a point where all of the dissolved oxygen is depleted during summer flow conditions. A load allocation was developed for the area and is presented in a later section. The Town recently completed its facilities planning requirements and is presently developing final plans and specifications.

Unity

Unity is a small town located on Winnecook Lake (Unity Pond) and Sandy Stream. The community has an existing waste treatment lagoon which discharges high quality effluent into Twenty-five Mile Stream, a tributary of the Sebasticook River.

The Town had two food processors, Jim's Peeled Potatoes, and Redi-Peeled Potato. Redi-Peeled presently discharges raw process water, but is planning to treat their own wastes and discharge to Sandy Stream. Jim's Peeled Potatoes was in violation of State and Federal statutes, and went out of business earlier this year.

Unity College, a small liberal arts school, is connected to the municipal system

Clinton

Clinton is located on the Class C Sebasticook River and discharges practically untreated wastes at River Mile 10. The Town has a community septic tank which was built at the time of the sewer construction. This tank, however, does not reduce the amount of pollutants which eventually enter the river.

Striar Woolen Mill discharges cooling water to the Sebasticook and sanitary waste to the municipal system. Clinton has 18 points on the DEP Priority Point System, less than Pittsfield, Newport, Dexter or Corinna in terms of priority ranking.

Winslow

The Town of Winslow is located at the confluence of the Kennebec and Sebasticook Rivers, both Class C waters. The Town presently discharges untreated wastes to both rivers although it was allotted construction grant funds for fiscal year 1975. The wastes from Winslow will be collected and conveyed to the Kennebec Sanitary Treatment District's secondary treatment facility which is presently under construction in Waterville.

Approximately one third of Winslow's wastes enter the Sebasticook whereas the majority is discharged to the Kennebec. Scott Paper, the Kennebec Basin's largest single source of waste is located in Winslow but discharges to the Kennebec above the confluence with the Sebasticook.

Other Communities

There are a number of other communities in the Sebasticook Drainage which do not have a municipal collection system but have or may have some direct discharge or other waste problems. These include Burnham, Benton, Thorndike, Albion, Freedom, China, Detroit, Palmyra, St. Albans, and Vassalboro.

Ethan Allan, Inc. a furniture manufacturer in Burnham has a secondary treatment facility for the sanitary wastes which discharge to the Class C Sebasticook River.

North Vassalboro has a number of direct discharges into Class C Outlet Stream. East Vassalboro, located just below China Lake on Outlet Stream, has no known direct discharges but has substantial subsurface disposal problems. The Town established a sanitary district and had a preliminary plan prepared in 1972. There is a possibility of a regional connection with the Winslow system which would entail eventual treatment at the secondary treatment facility presently under construction in Waterville. The Vassalboro Sanitary District has 18 points on the DEP Priority System.

B. Load Allocations

The DEP developed load allocations on various segments of the Sebasticook River and East Branch Sebasticook River. This was done since these segments were classified as Water Quality Segments (WQ) as discussed in Section IV subpart A., Segment Classification. The following segments were analyzed:

Upper Main Stem (Hartland)

Upper East Branch (Dexter - Corinna)

Lower East Branch (Newport)

Lower Main Stem (Pittsfield including Lower East Branch)

Each of the allocations are discussed below. The DEP utilized a mathematical water quality model in the allocation process. This model was developed for the DEP by Halcon Computer Technologies, Inc. through an EPA contract as part of the National Modeling Program. Data was gathered for the computer model calibration and verification processes by the DEP in 1973 and 1974 and by the E.C. Jordan Co. of Portland in 1974 through a contract with the DEP. This data is discussed in Section III, subpart B, Existing Water Quality.

Upper Main Stem (Hartland) Allocation:

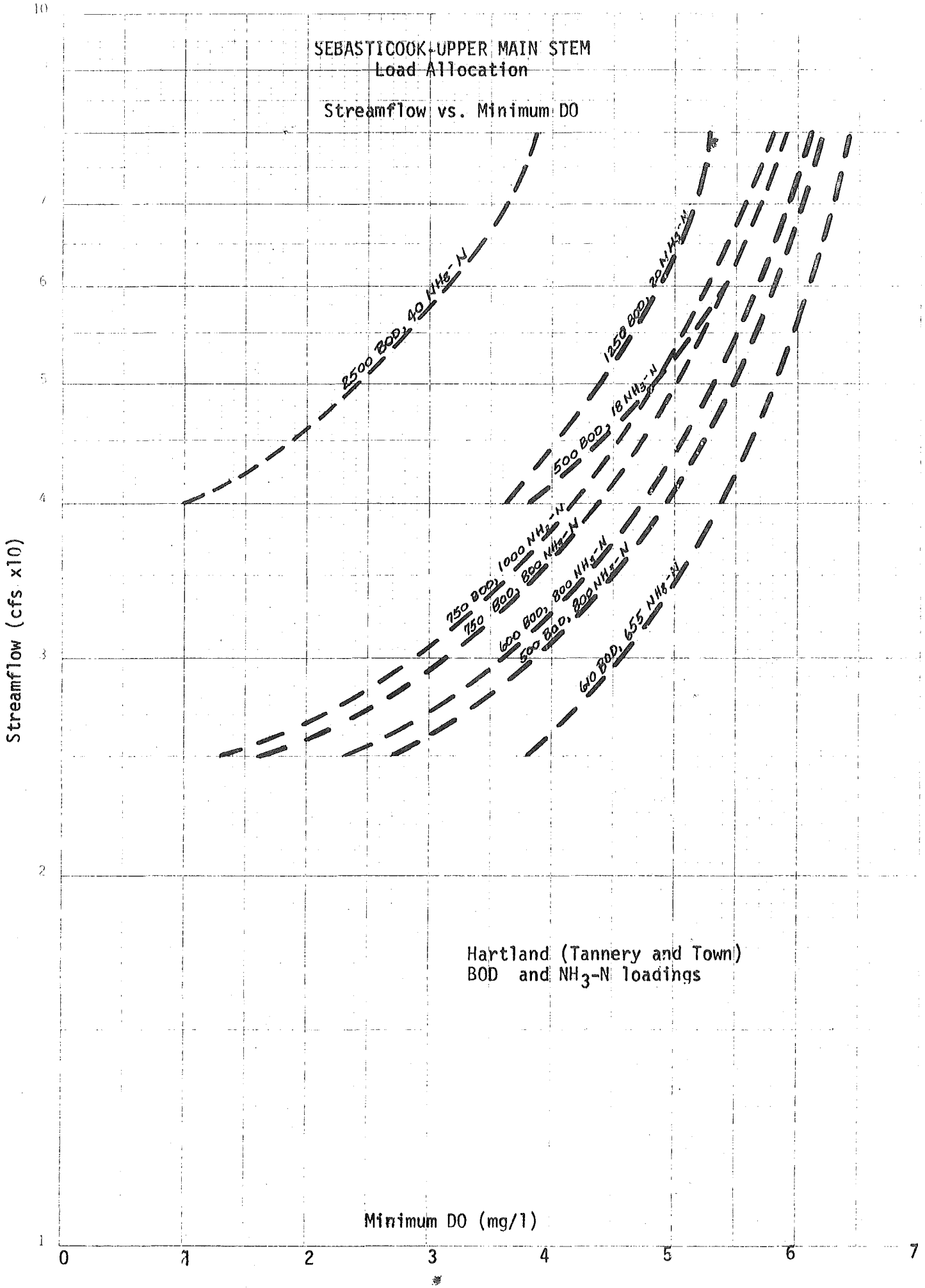
The maximum allowable loadings from the Hartland area which will maintain a Class C water quality was determined as follows for summer conditions:

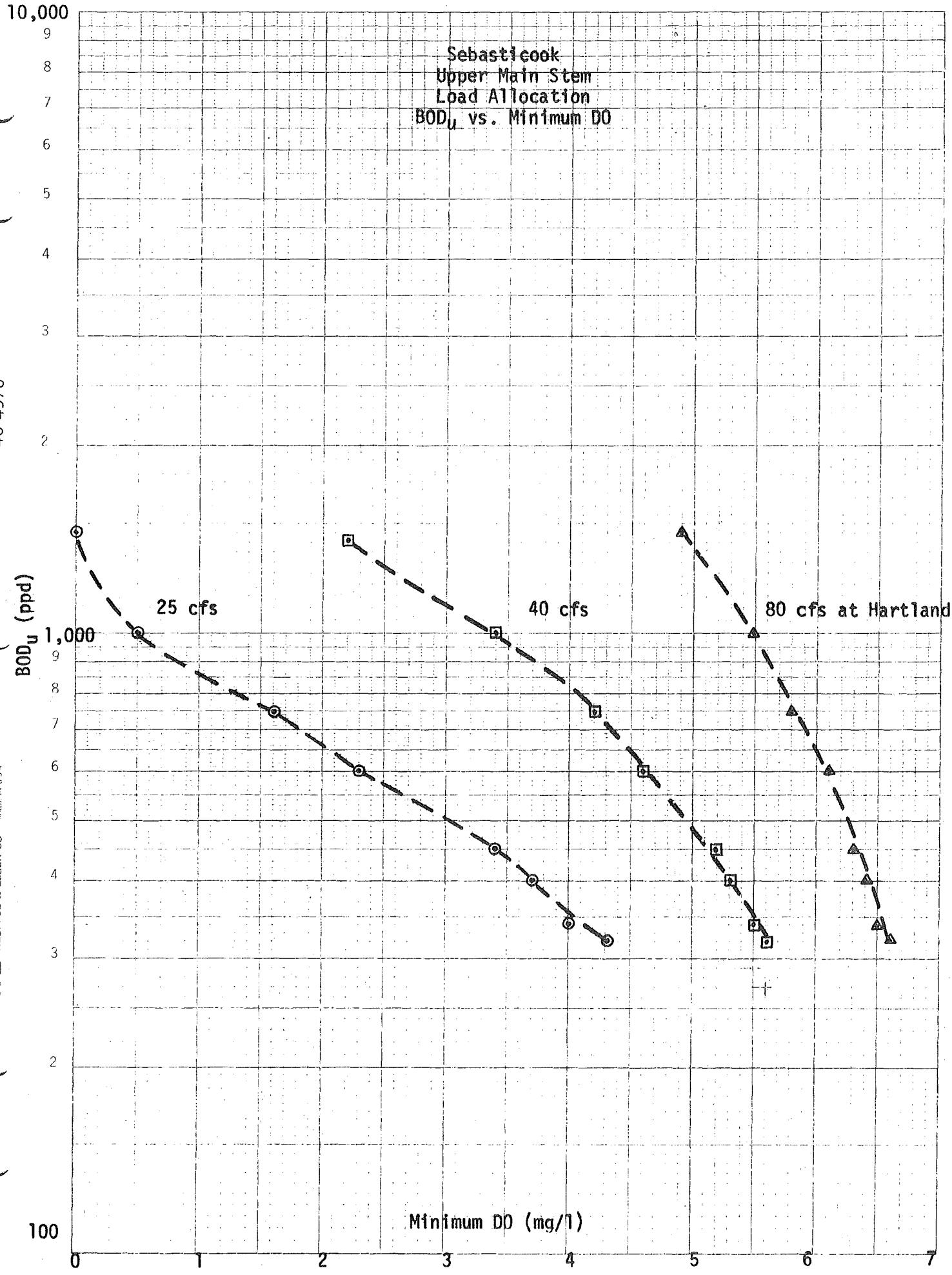
300 lb/day	BOD_5 at	30 cfs	from Great Moose Lake
475 lb/day	"	40	"
750 lb/day	"	50	"
900 lb/day	"	60	"
1100 lb/day	"	70	"
1300 lb/day	"	80	"

This allocation also takes into account the ammonia (NH_3-N) loadings associated with the above BOD_5 as would be expected from the Irving Tanning effluent. The NH_3-N loading, which is characteristic of tannery wastes, is equivalent to approximately 110% of the BOD_u. The following two graphs present both the BOD and NH_3-N loadings in terms of stream flow and minimum expected DO.

Upper East Branch (Dexter-Corinna) Allocation:

The Upper East Branch was the most difficult segment to model and subsequently allocate loads, due to a complexed water quality, algal, nutrient, and waste loading condition. The wastes from Dexter enter the East Branch just below Wassookeag Lake. The river then flows into a boggy area a few miles below Dexter where nutrient interactions occur which can not be accurately modeled. The River continues into Corundel Lake located just above the Eastland Woolen Mill in Corinna. The mathematical model again breaks down in this impoundment, the water quality of which is questionable. The East Branch then receives wastes from the Eastland bypass discharge and the Corinna Sewer District (CSD) secondary treatment effluent before entering Sebasticook Lake. The CSD effluent, as stated previously, does not meet its designed effluent quality and the River here again receives a considerable amount of wastes.


SEBASTICOOK-UPPER MAIN STEM
Load Allocation
Streamflow vs. Minimum DO
2500 BOD, 40 NH3-N
1250 BOD, 20 NH3-N
500 BOD, 18 NH3-N
750 BOD, 1000 NH3-N
750 BOD, 800 NH3-N
600 BOD, 800 NH3-N
500 BOD, 800 NH3-N
610 BOD, 655 NH3-N
Hartland (Tannery and Town)
BOD and NH3-N loadings
Streamflow (cfs x10)
Minimum DO (mg/l)
10
7
6
5
4
3
2
1
0
1
2
3
4
5
6
7


Sebasticook
Upper Main Stem
Load Allocation
BOD$_u$ vs. Minimum DO
25 cfs
40 cfs
80 cfs at Hartland
BOD$_u$ (ppd)
Minimum DO (mg/l)
10,000
1,000
100
0
1
2
3
4
5
6
7
46 4970
SEMI-LOGARITHMIC 2 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO MADE IN U.S.A.

The lack of data on the algal growth potentials, the River hydraulics, and River reaction rates has prevented the DEP from determining a waste load allocation on this segment at this time. The major objective of the allocation will be to limit the total phosphorus loading into Sebasticook Lake with the dissolved oxygen of the River as a secondary consideration. A nutrient balance is being proposed by the DEP to be performed on the East Branch above the outlet of Sebasticook Lake. The results of this study will be used in facilities planning processes proposed for Dexter and Corinna in FY 77.

Lower East Branch (Newport) Allocation:

The allocation for this segment is presented below for summer conditions:

500 lb/day BOD_u at 12 cfs from Sebasticook Lake

or 340 lb/day BOD_5

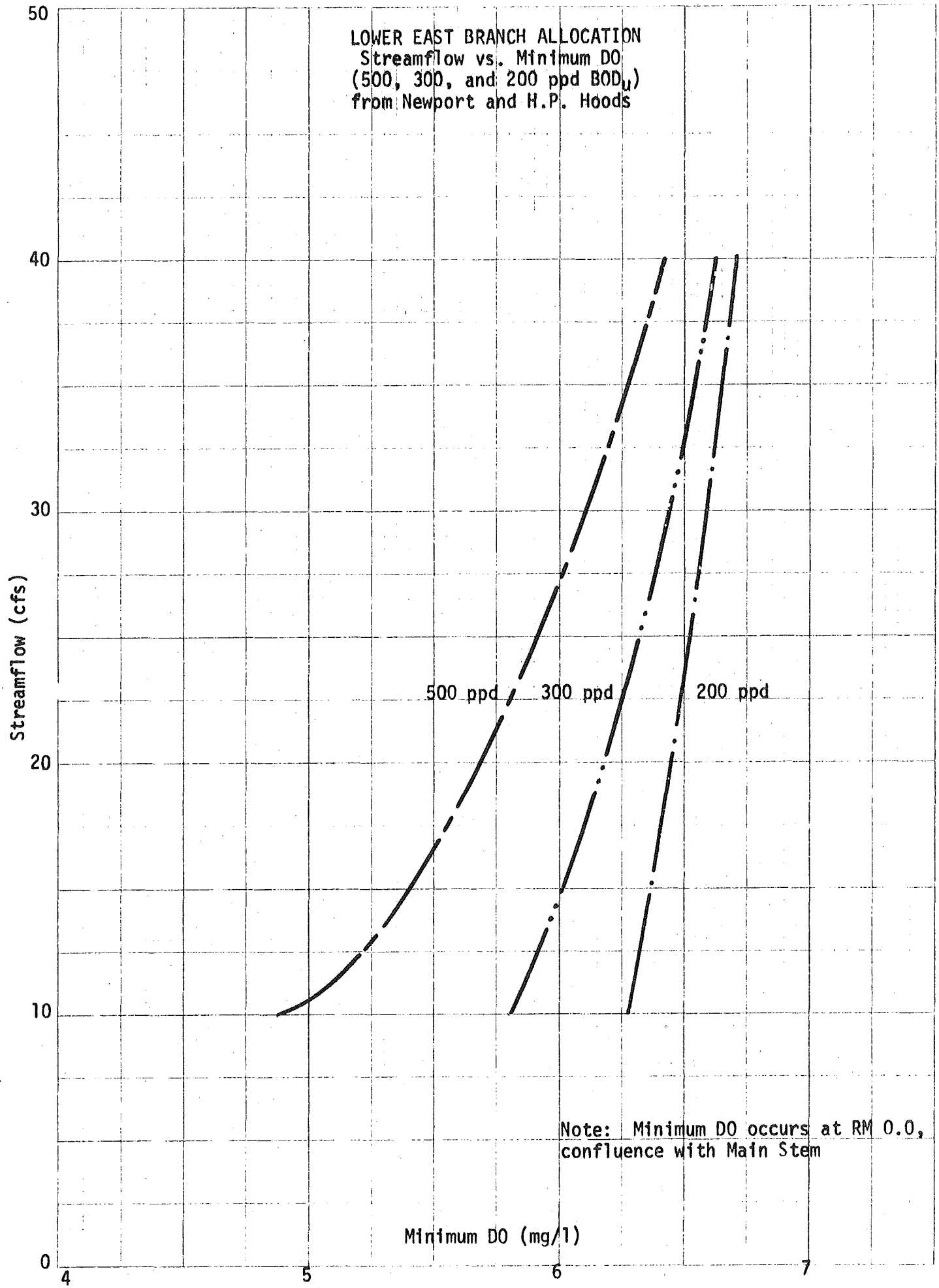
The following graphs present the above figures in graphical form.

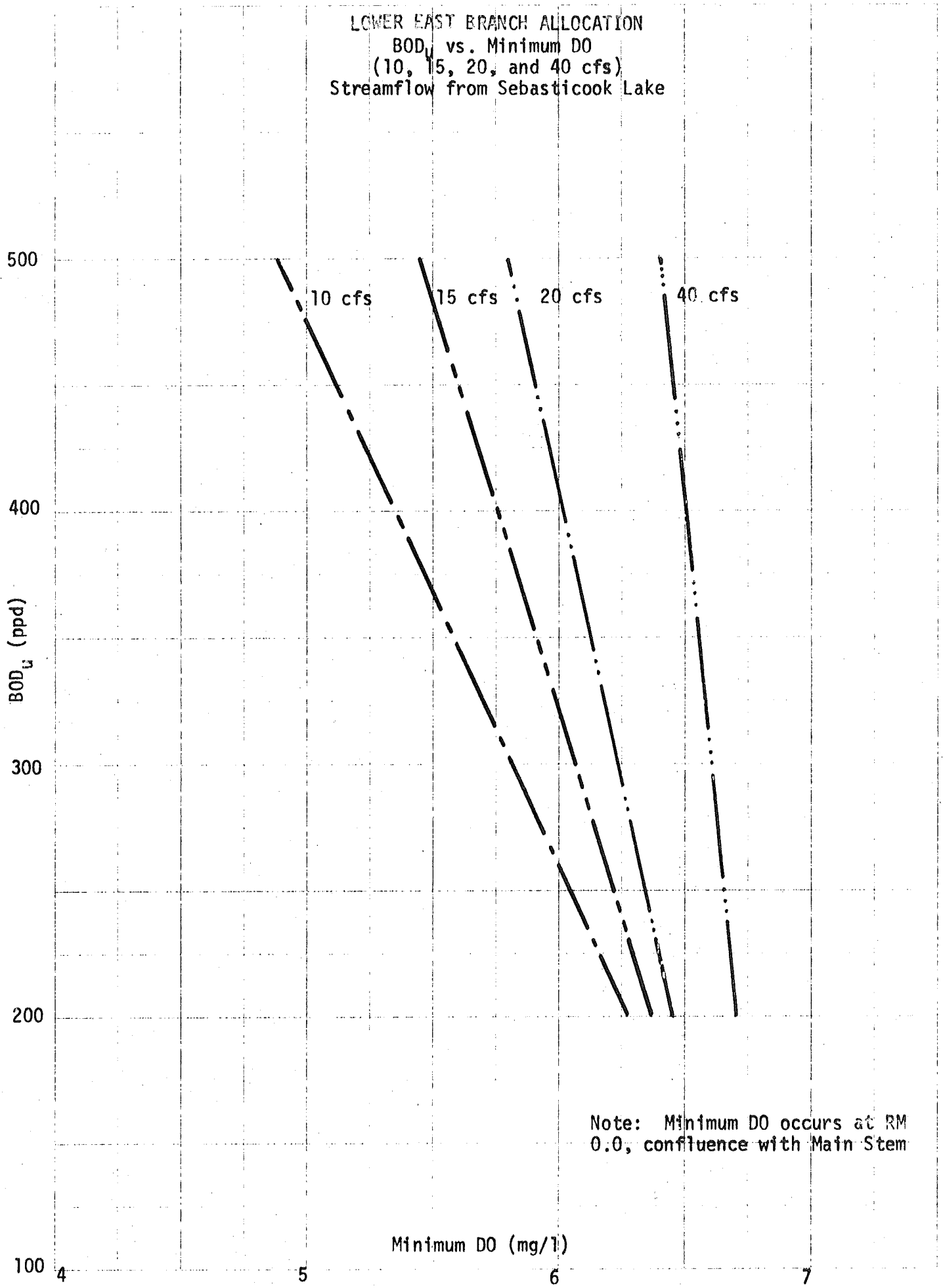
Lower Main Stem (Pittsfield) Allocation:

There was no allocation developed for this segment since the water quality standards of the stream would be met after the Town of Pittsfield and the associated industry built a secondary treatment facility. The lowest quality of this segment would occur just below the confluence with the East Branch because of the low East Branch water quality. However, there is not expected to be a violation of stream standards.

C. Discussion of Allocations

The load allocations presented in the previous section were all based upon the water quality data gathered in 1973 and 1974 and a computerized mathematical water quality model. The water quality data was presented in Section III, Water Quality and the math model is discussed briefly in the appendix.


LOWER EAST BRANCH ALLOCATION
Streamflow vs. Minimum DO
(500, 300, and 200 ppd BOD_u)
from Newport and H.P. Hoods
Streamflow (cfs)
50
40
30
20
10
0
500 ppd
300 ppd
200 ppd
Note: Minimum DO occurs at RM 0.0, confluence with Main Stem
Minimum DO (mg/l)
4
5
6
7


LOWER EAST BRANCH ALLOCATION
BODu vs. Minimum DO
(10, 15, 20, and 40 cfs)
Streamflow from Sebasticook Lake
10 cfs
15 cfs
20 cfs
40 cfs
500
400
300
200
100
BODu (ppd)
4
5
6
7
Minimum DO (mg/l)
Note: Minimum DO occurs at RM 0.0, confluence with Main Stem

The load allocations for both the upper Main Stem, or Hartland area, and the lower East Branch, or Newport area, were developed with a relatively high degree of certainty. The upper East Branch allocation was not developed due to a large degree of uncertainty in both the water quality data and the mathematical model's ability to predict water quality under such conditions as prevails in this stream segment. These conditions include high nutrients, slow velocities, shallow depths, and algal blooms. It is for these reasons that a complete nutrient balance and lake sediment study that is being performed by the DEP will aid in accurately determining the required phosphorus reductions at Corinna and Dexter which will beneficially effect Sebasticook Lake's water quality.

As the proposed treatment facilities are built and operating, the DEP will reassess these allocations and make the necessary revisions. Permanent recording streamflow and water quality devices would greatly assist in this evaluation. These items are being proposed in this plan.

D. Summary of Abatement

The following table summarizes the waste abatement activities in the Sebasticook Drainage:

Source	Status	Municipal Priority Points
Hartland Irving Tanning	(a) Joint treatment facility under construction.	-
Pittsfield Edwards Corp.	(a) Received FY 76 Step 3* Grant. (b) Edwards to be included after pre-treatment. (c) Some Step 1* requirements also needed.	-
Clinton Misc. Industries	(a) Will require Step 1 grant (b) Industrial wastes included in system. (c) Lower basinwide priority.	18

Source	Status	Municipal Priority Points
Winslow	(a) Received FY 75 Step 3 grant. (b) Will treat wastes at Waterville.	-
Dexter Misc. Industries	(a) Will receive FY 77 Step 1 grant. (b) Industries may tie in to town.	22
Corinna Eastland Woolen	(a) Will receive FY 77 Step 1 grant. (b) Completed joint secondary facility requires additional work.	20
Newport H.P. Hoods	(a) Received FY 76 Step 2* grant. (b) Joint treatment proposed. (c) Step 1 plan completed FY 75.	20
Vassalboro	(a) Will receive Step 1 grant. (b) Lesser basinwide priority.	18
Unity Misc. Industries	(a) Completed secondary (b) Industries require abatement.	-

+Treatment at Pittsfield may be either a joint industrial/municipal plant or separate facilities.

*Step 1 grant denotes facilities planning.
Step 2 grant is for final plans and specifications.
Step 3 grant is for construction.

See Section VI for more details.

V. Monitoring

A. Existing Data Needs

As mentioned previously, the Sebasticook River was sampled intensively during the summers of 1973 and 1974. This data gathering included water quality data, biological data, time of travel data, and flow measuring.

The data was gathered in part for the verification and calibration of the computerized mathematical water quality model which was used to develop the load allocations. This model, which was funded by the U.S. EPA, will also be used to determine the feasibility of water quality classification upgrading in the future.

The area of greatest data needs lies in the upper East Branch. The lack of sufficient nutrient and sediment data on Sebasticook Lake and its tributaries prevented the development of load allocations for both Dexter and Corinna.

The second most important area of deficient data is in flow measuring. The USGS maintains a continuous gage at Pittsfield on the Main Stem, the only one in the entire drainage. This gage is located below the confluence with the East Branch which leaves both the upper Main Stem and the entire East Branch essentially ungaged. The DEP established three staff gages during the water quality surveys at Hartland, Corinna, and Newport. These gages were adequate for the surveys but continuous recording devices are needed to develop the required data on the drainage hydrology.

B. Future Needs

The DEP established one of its 19 Primary Monitoring Network (PMN) stations on the Sebasticook River at the Route U.S. 2 bridge at West Palmyra. This station will be sampled monthly for temperature, pH, dissolved oxygen, total coliform and fecal coliform bacteria, turbidity, biochemical oxygen demand and nutrients. Also a biological sample will te taken annually.

Data obtained from this station will be useful to both the DEP and EPA in observing trends in water quality. For enforcement purposes, however, a continuous data gathering method should be established, especially on the segments of the Sebasticook River below Hartland and below Corinna on the East Branch. The DEP will be considering the installation of continuous flow measuring devices in conjunction with a DO, pH, conductivity, and temperature measuring device at the above two locations in the near future.

Other future needs lie in the water quality of the tributaries. The quality of the Main Stem and East Branch precluded the DEP from sampling the tributary flows in any detail. Once the major wastes sources are treated, however, then more attention will be given to both tributaries and non-point waste sources.

Historically, non-point sources of wastes have been considered less important, however, as the Basin advances on its point source abatement, non-point sources should be dealt with in greater detail. In addition, information gained during the next two years from the Statewide "208" programs should provide a broader base with which the DEP can initiate an effective monitoring and abatement program. It is recognized that throughout the Basin, agricultural runoff is significant, with silvicultural activities and poorly operating septic systems contributing to the non-point pollution problem.

VI. Other Planning

A. Facilities Planning

As previously stated, only two communities in the entire drainage Basin have abatement facilities in operation. Winslow and Pittsfield were allotted construction grants from the DEP and EPA for FY 75 and FY 76, respectively. Likewise, Hartland, including the tannery, also received a construction grant for a joint treatment facility which should be operational by the end of this year. Newport was awarded a Step 2 grant for final design and specifications which will include the H.P. Hood dairy process waste. Pittsfield should break ground within a month for the construction of a secondary facility. The remaining communities require an update of their preliminary engineering reports or a facilities plan. Facilities plans, developed pursuant to Section 201 of PL 92-500, is the first of three steps in attaining a construction grant. The DEP developed a priority system for the allocation of construction grant funds which rates each needed project in a relative basis. Points are given to communities depending upon their problems and water quality needs. Under this system, a description of which is appended, a maximum of 41 points may be assigned to a project.

The table below presents the facilities planning areas along with the priority points of the individual community in the Sebasticook Basin:

Dexter	22
Corinna, Newport	20
Clinton, Vassalboro	18

Burnham was included on the preliminary draft of FY 77 Priority Point System, considered to require pollution abatement without any assigned points.

These facilities plans will ensure that the projects meet the water quality standards of the waterways in the most cost effective, environmentally sound manner.

Alternatives must be considered for treatment type, regional locations, and management options. In addition, the load allocations developed for the receiving waters must be utilized in the proposed treatment works.

B. Areawide Waste Treatment Management Planning

Section 208 of PL 92-500 allows the governors of the various states to designate certain areas for areawide planning due to the severe nature of the area's water quality problems. The Governor of Maine has designated five such areas. The Sebasticook area, although considered, was formally non-designated although it appeared that the water quality control problems were complex enough to warrent designation. The reason for the non-designation was the lack of public interest in the 208 planning concept in a number of area communities. Since public participation is a key factor in 208 planning, it was felt that non-designation was the best course of action.

Although the DEP reconsidered designation of the Sebasticook area during FY 75, the idea was again rejected due to similar problems that occurred in the previous year.

Since these designations, a Federal Court decision ruled that 208 Areawide Waste Treatment Management Planning must be conducted for all land area of the entire United States. Although final grant totals to the States for 208 planning in formerly non-designated areas are pending, it appears that Maine as well as most states will receive only a limited amount of money. The DEP intends to distribute most of these grants to the Regional Planning Agencies to perform 208 Plan Elements considered a high priority in each respective planning area. The North Kennebec Regional Planning Commission will conduct the 208 planning for the Sebasticook Basin. Key planning elements will concentrate on non-point sources and their control.

C. Updates

This plan itself must be updated as additional information is obtained or as the waste abatement program progresses to a point where re-analysis is necessary. As previously mentioned, non-point sources and tributary wastes will be addressed in the future. When this occurs, the plan will be revised accordingly. This document is considered Phase I Basin Planning, with Phase II scheduled to be completed by November 1, 1978.

Appendix I

Water Quality Model Description

Introduction

A computer simulation or mathematical water quality model was developed utilizing conditions of steady state flow rates and pollutant input rates for the Kennebec and Sebasticook Rivers. This model was a modification of the basic DOSAG computer program, developed by Halcon Computer Technologies, Inc. (HCT) of New York.for the EPA and DEP as part of the EPA National Modeling Program.

The classical Streeter-Phelps DO-BOD equation is utilized as the basis of this model, with the addition of supplementary water quality determinents. The program is also adaptable to the Metric System with a minimum of revisions.

Calibration

As discussed previously under the Load Allocations section, it was possible to model only the upper Main Stem and lower East Branch of the four Water Quality Segments. The other segments were not modelled to produce a load allocation for several reasons. First, there was a large degree of uncertainty in the available water quality data. Secondly, the mathematical model's ability to predict water quality under such existing conditions in this stream segment is questionable. Conditions of slow velocities, shallow depths, high nutrients, and algal blooms are diffucult to assess using this computerized mathematical water quality model.

Final calibration of the model was performed on the Upper Main Stem and Lower East Branch, utilizing 1973, 1974 DEP data and the 1974 E.C. Jordan Co. data. Once the model was predicting the observed data to a reasonable degree, projected waste loads were run to determine both the required streamflow and the allowable discharges to maintain stream standards.

For the Upper Main Stem at Hartland it can be seen from the graphs that in order to maintain a Class C water quality standard, 300 lb/day BOD_5 requires 30 cfs

and 80 cfs with a load of 1300 lb/day. On the Lower East Branch in Newport, at a summer low flow of 12 cfs can handle 340 lb/day BOD_5. It is expected that after the intensive data gathering effort on the Upper East Branch, a load allocation will be performed for this section.

Appendix II

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.

PRIORITY	BASE POINTS	A ORDER AND DIRECTIVE +10	B EPA PRIORITY BASIN +3	C CLASS I SEGMENT +4	D CLASS II SEGMENT +3	E CLASS III SEGMENT +2	F DISCHARGE EFFECTS LAKE SYSTEM +4	TOTAL MAXIMUM POINTS
		PROJECT LOCATION*						
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

* See DEP Segment Classification

MUNICIPAL PRIORITY LIST

PRIORITY	BASE	ADD-ON
33 Points		
Scarborough S.D.	2	A,D
29 Points		
Sabattus	3	B,D,F
26 Points		
Jackman S.D.	1	E,F
24 Points		
Saco (Factory Island)	8	A,E
23 Points		
Aroostook-Prestile T.D. (Caribou)	3	C
Portland W.D. (Portland Phase II)	3	C
22 Points		
Bridgton	5	E,F
Brunswick S.D. (WWTF)	5	B,D
Dexter U.D.	6	C,F
Dixfield	5	B,D
Great Salt Bay S.D.	2	E
Mechanic Falls S.D.	5	B,D
Mexico S.D.	5	B,D
Northport Village Corp.	2	E
Patten	5	E,F
Searsport	2	E
Wells S.D.	2	E
21 Points		
Aroostook-Prestile T.D. (Presque Isle)	4	C
Grand Isle	4	C
Washburn	4	C
20 Points		
Boothbay Harbor S.D.	1	
Corinna S.D.	8	C,F
East Millinocket	5	C
Kennebunkport (Cape Porpoise)	2	
Limerick S.D.	6	E,F
Milbridge	2	

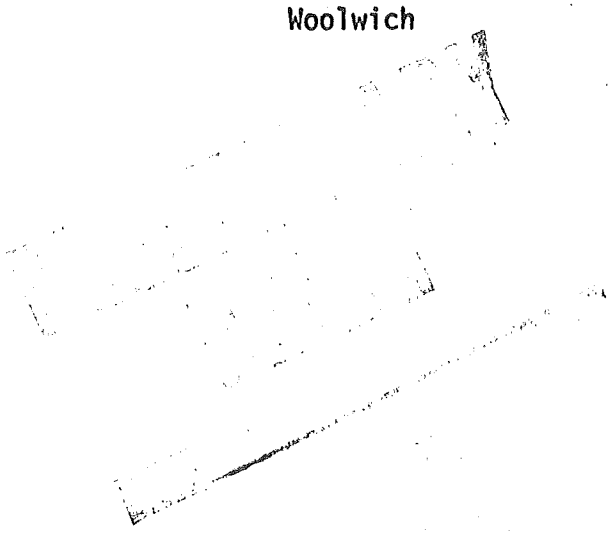
PRIORITY	BASE	ADD-ON
Newport S.D.	5	C
Sanford S.D.	8	C,F
19 Points		
Augusta S.D. (WWTF)	5	D
Bangor (Penobscot Int)	5	D
Farmingdale	5	D
Frenchville	4	E
Gardiner	5	D
Hallowell W.D.	5	D
Hampden	5	D
Howland	5	D
Lincoln S.D.	5	D
Norridgewock W.D.	5	D
Norway	8	B,C
Peru	7	B,D
Randolph	5	D
Veazie S.D.	5	D
Winterport S.D.	5	D
18 Points		
Bethel	8	B,D
Biddeford (Pool)	5	E
Bucksport	5	E
Clinton W.D.	6	C
Dover Foxcroft	5	E
Guilford-Sangerville S.D.	5	E
Isleboro	5	E
Kezar Falls	5	E
Stonington	5	E
Tremont	5	E
Vassalboro S.D.	5	E
17 Points		
Cape Elizabeth (Portland W.D.)	6	D
Passamaquoddy R.H.A. (Pleasant Pt.)	8	B,E
16 Points		
Brownville	6	E
Cumberland	7	D
Enfield	7	D
Gorham (Little falls)P.W.D.	5	
Kennebunk S.D.	8	C
Mars Hill U.D.	8	C
Milo W.D.	6	E
North Berwick S.D.	6	E
Rockport	6	E

PRIORITY	BASE	ADD-ON
15 Points		
Bangor (WWTF)	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. (WWTF)	8	E
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
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	

Appendix III

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



STATE OF MAINE

Inter-Departmental Memorandum Date February 10, 1972

To George Gormley, Chief, Bureau of Water Pollution Control Dept. Environmental Improvement Commission

From Matthew Scott, & David Courtemanch Dept. Environmental Improvement Commission

Subject Pittsfield Sewage Treatment Plant

On February 3, 1972 staff member David Courtemanch and I investigated the proposed STP site to be located near the south end of the north south runway off the airport in the town of Pittsfield. We stopped at the office of Kleinschmidt & Dutting to review some aerial photographs and discussed site location plans. The planned system for the treatment of sanitary and some industrial wastes is a secondary plant with stabilization ponds and some chlorination for the final outfall.

We visited the site via snowmobile and made a cursory vegetation survey of the area. We took four polaroid photographs of the area to provide a basis of the viewed vegetative cover that exists during the winter months. Photos number 1 and 2 show the open area where the effluent from the bog would be discharged to the river. (This is a southerly position looking north.) Photo number 3 is from a northerly position looking south. Photo number 4 shows the telephone cable line which is westerly of the proposed disposal area (bog). Attached is a photocopied portion of the Pittsfield Quadrangle indicating the site location on this attached map.

The geology of the area is such that a glacial till exists forming an inverted U bounded by the Sebasticook River. There is a heath that exists due east of the till and is not the same vegetation as the bog we visited. The bog presently is an area of little economic or recreational value, and provides only a limited wildlife habitat. Poor production and utilization may be accounted for due to seasonally fluctuating water levels, lack of available nutrients, poor soil structure and high acidity.

It is characterized by typical heath vegetation. Willow, Sweet gale, Leatherleaf, and Sedge were most abundant and other typical heath plants (Ericaceae) could probably be found but not visible due to snow cover. The wildlife community probably includes Red Winged Blackbird, Yellow Warbler, Marsh Wren and Swamp Sparrow. Other species which might utilize the bog for certain activities (i.e. feeding) might be swallows, fly catchers, hawks, etc. The Mammalian population probably includes numerous small rodents, insectivores, and snowshoe hare. At present the bog is a poor area for the production of game animals.

We returned to Augusta and reviewed the situation with the Regional Fishery and Game Biologists of the Fish and Game Department which manage this region. It is of the opinion from both biologists that secondary treatment of the waste products from the town of Pittsfield is a step forward for river clean-up to meet the classification of a C standard for the Sebasticook River. It is also of their opinion that tertiary treatment would be a much better approach to the problem to up-grade the water quality of the Sebasticook than secondary treatment. It is also the opinion of the Regional Game Biologist that no significant habitat would be destroyed if a discharge from a secondary plant of about one million gallons per day was allowed to filter across the disposal area. This means about 41,650 gallons per hour will go into the area and would have to be dispersed somehow to prevent erosion.

The proposed STP could significantly change the <u>character</u> of this area and <u>may possibly increase productivity and wildlife utilization</u>. At an expected rate of about 1 million gal/day outflow one might expect the following changes in the habitat:

1. This outflow will provide a nutrient rich water supply to the area which should provide for increased plant growth. Changes in the species composition of the plant community can also be expected.

2. This outflow will alleviate the stagnated nature of the existing water, which could cause an acceleration of peat decomposition thus releasing additional nutrients. The affects of accelerated peat decomposition could be numerous. This could cause a "sinking" of the bog although this process would probably be very slow. Decomposition could, however, cause an increased nutrient load for the Sebasticook River (doubtful).

3. Since the area would be "flushed" every 6 months, there would be a gradual lowering of the acidity of the ground water in the area. This would probably aid the introduction of less tolerant plants.

4. The additional water added to this area could also create some year-round open water. This might provide suitable habitat for waterfowl, muskrats, etc.

In view of all the above findings and discussions with responsible representatives it is our opinion that this project would not disrupt or cause any <u>significant</u> harm to the environment of the discharge area. If any, this could provide a very good "polishing effect" of the final effluent before it reaches the Sebasticook River. It must be pointed out however, that the growing season will be the only time of the year which will really provide good nutrient up-take by the existing vegetation. (Approximately 6 months) This means that during the remainder of the year nutrients would only be retained by the sediments and any excess would eventually reach the Sebasticook River. It is therefore our opinion that this project be approved since matters of open sewers, bacterial problems, industrial wastes, B.O.D., and some major nutrient sources would be abated which should lead to improved water quality of the Sebasticook River. This would lead to

better habitat for warm-water game fish and aesthetics of the river for future recreational possibilities.

It is therefore our recommendation that approval be based on considerations of the various expertise consulted for the discharge area. Also that some monitoring on our part (E.I.C.) be attempted to provide a demonstration as to the benefits or harm that may come of the area in future years. This could be done by setting up some vegetative plots and doing some water analysis with control stations.

MS/DC/dc

Matthew Scott

Matthew Scott

Aquatic Biologist

David Courtemanch

David Courtemanch

Engineering Technician

Appendix IV

Appendix IV

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.

Cubec 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_3) 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 - Is the measure of the interferance 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 V

Public Participation

On October 22, 1974 a preliminary meeting was held at the North Kennebec Regional Planning Commission headquarters to explain the then pending 303(e) Basin Plan. Again, early in 1975 another informal meeting was attended by the DEP to explain the progress of the 303(e) plan and to receive any input prior to a public hearing. This prompted the Sebasticook Lake Assocation to circulate a petition for the future improvement of Sebasticook Lake and to support the concept of a "basin-wide plan". This petition received the endorsement of 133 residents of the Newport-Sebasticook area (copy enclosed). This action encouraged Newport officials to act on the Basin Plan. At the public hearing held on June 4, 1975 the Newport Board of Selectmen unanimously approved the Sebasticook River Basin Water Quality Management Plan. The Selectmen drafted a Resolution (enclosed) to support the Plan and forwarded to the DEP. The Sebasticook Lake Association has been extremely concerned and helpful in aiding the efforts of the DEP.

Enclosures:

1. Letter from DEP to Member of Board of Directors - Sebasticook Lake Association.

2. Copy of Petition for the preservation of Sebasticook Lake and Basin Plan support.

3. Newspaper article announcing Basin Plan presentation.

4. Newspaper summary of meeting discussing Basin Plan.

5. Newport Board of Selectmen Resolution on proposed Sebasticook River Basin Water Quality Management Plan.

6. Comments on Basin Plan from member of Board of Directors of Sebasticook Lake Assocation.

STATE OF MAINE

Department of Environmental Protection

WILLIAM R. ADAMS, JR.
COMMISSIONER

ADMINISTRATION
289-2811

BUREAUS OF:
AIR QUALITY CONTROL
289-2437
LAND QUALITY CONTROL
289-3762
WATER QUALITY CONTROL
289-2591

MAIN OFFICE:
STATE HOUSE
AUGUSTA 04330

REGIONAL OFFICES:
BANGOR
31 CENTRAL STREET
BANGOR 04401
947-6746
PORTLAND
415 CONGRESS STREET
PORTLAND 04101
775-6587
PRESQUE ISLE
634 MAIN STREET
PRESQUE ISLE 04769
764-3737

March 24, 1975

Thomas Hannula
RFD 2 Box 9
Newport, Maine 04953

Dear Mr. Hannula:

I am writing in response to your letter of March 3, 1975 to John McGrail concerning the East Branch Sebasticook River and Sebasticook Lake water quality. I am enclosing the EPA Sebasticook Lake reports are requested.

I am presently working on a water quality management plan for the Sebasticook Drainage which will contain information of the quality of the River as it enters the Lake as well as the quality of the River below the Lake. The Lake itself has been studies by EPA and the PHS as you are aware.

Both the E. Branch and Sebasticook Rivers were extensively sampled by the DEP during both the summers of 1973 and 1974. The results of this data will be included in the above basin management plan. A computerized mathematical water quality model was also employed in the plan analysis. I can make a copy of the plan available to you at such time as it is complete. A public meeting will be scheduled to present the plan to all interested parties prior to finalization. An informal meeting was held last fall at the North Kennebec Regional Planning Commission office to explain the purpose and scope of the forthcoming plan.

Both Dexter and Corinna are scheduled to develop facilities plans during the coming fiscal year (FY-76) to assist them in solving their waste treatment problems. I suggest that you contact both towns and become involved in the planning process. As you know, severe water quality control problems exist on the upper E. Branch.

If I can be of further assistance, please do not hesitate to contact me or call at 289-2811.

Sincerely,

Steven Freedman

Steven Freedman
Assistant Engineer

SF:amm

(9)

We, the undersigned, for the future improvement of SEBASTICOOK LAKE for the current generation and the generation to follow, hereby PETITION: that no further plans or money be expended for individual sewer treatment plants in the communities of Dexter, Corinna or Newport until a complete basin-wide plan is made which would include the above lake.

Alternates methods such as a pipeline to by-pass SEBASTICOOK LAKE with Corinna's and Dexter's effluent might be employed. THE UNITED STATES ENVIORMENTAL PROTECTION AGENCY's 1974 survey showed " the communites of Corinna and Dexter contributes about 70 percent of the total annual phosphorus load to SEBASTICOOK LAKE". If this phosphorus was removed, according to the study, a persistent phosphorus limitation would result and thereby reduce or eliminate nuisance algae blooms.

****

Robert E. Weaver	RD 2 Newport Me.
Eleanor J. Sawyer	R#1 Corinna, Me. 04928
Gertrude Weaver	R.F.D. 2 Newport, Me.
Ernest Turner	RFD 2 " "
Virginia Turner	RFD 2 Newport, Me.
Earl T Creighton	P.O. Box 205 Newport Me.
Helen Melanson	RD 2 Newport Me.
Rena M. Tardy	R#2 Newport Me.
Mabel Tardy	" " Newport Me.
Ray Tardy	" Newport Me
Mabel Gilman	" Newport Me.
Robert E Vaughn	Newport Me
[illegible]	Newport Me
Warren Whitney	Newport Me
Tom Breaking	Newport ME

MORNING SENTINEL, Tuesday, June 3, 1975

Selectmen To Act On River Plan

Selectmen will meet Wednesday in regular bi-monthly session at the fire hall at 7 p.m.

New business on the agenda is a resolution supporting the Sebasticook River Basin Water Quality Management Plan and the approval of a town meeting warrant.

Miller said proposed articles will deal with accepting the Newport Water District as passed by the 107th State Legislature. Miller listed this item as the most important one to be taken up at the special town meeting. Acceptance of the article would create the Newport Water District and set in motion the purchase of the company from the Maine Water Co.

MORNING SENTINEL, Friday, June 6, 1975

Newport Officials Approve River Plan

By JEANNETTE BROWN
(Newport Correspondent)

A resolution supporting the State Department of Environmental Protection's Sebasticook River Basin Water Quality Management Plan was unanimously approved by the Newport Board of Selectmen at their semi-monthly meeting Wednesday.

The action followed a meeting last week in Winslow when the plan was unveiled at a meeting of the North Kennebec Regional planning Commission. More than 30 members of the Sebasticook Lake Association and town officials attended the session in Winslow to support the plan.

THE RESOLUTION in part says, that Sebasticook lake must be protected and returned to its original status. The lake currently suffers from an algae problem the latter part of the summer months caused by phosphates emptied into it from the communities of Corinna and Dexter. Copies of the resolution will be sent to the DEP, Federal Environmental Protection Agency and the communities involved.

June 16 at 7:30 p.m. at Higgins Gym was the date and place set for the special town meeting by selectmen on Wednesday.

Several articles were approved for the meeting.

The 107th Legislature has approved a bill to create a Newport Water District which now must go before the voters of Newport for approval.

An article will ask voters to approve the purchase of the Newport Water Company, and if accepted, election of trustees will follow at a later date.

The community's planning board will have three articles on the warrant, the first seeking approval of the Federal Flood Insurance Act, the second asking approval of a Flood Plain Ordinance and the third article will seeking adoption of a subdivision ordinance.

The Newport Development Corp., will seek authority for the town to secure an option on land for an industrial park, in another article. Ronald Miller, town manager, also said the Development Corp., is expected to have a recommendation on a site at the special town meeting.

ANOTHER ARTICLE suggested by Miller but rejected by the selectmen requested the condemnation of the Odd Fellows Hall on Water Street. Ardain "Zeb" Trask, selectman, went on record rejecting the article for a special town meeting as historically a small turn-out comes to such meeting. Trask said he felt the issue of the hall was both historical and serious and should wait for the annual town meeting.

Miller said there was no reason why the article could not wait until March and selectmen voted unanimously to reject the proposed article.

A police department cruiser will be the topic of another article asking for authority to spend $2200 out of either surplus or federal revenue sharing for the leasing with maintenance of a new cruiser.

Selectmen altered this article to give the voters a choice between leasing and purchasing.

Mrs. Evelyn Roussin, selectwoman, informed the police chief and the board they should be prepared to answer why the cruiser is seen in several other communities repeatedly. She said she had had numerous calls voicing this complaint.

Selectman Trask responded it was cheaper for the cruiser to be used on out-of town-business the to pay mileage.

Several residents of the rural area also voiced complaints that they were not getting any police protection in the country but were paying their fair share of taxes for the department.

Selectmen agreed that was a problem.

Miller then requested another article asking for a $250 to $3000 appropriation out of either federal revenue sharing or surplus for an addition to the town office space. He said the town office was becoming increasingly crowded, especially if citizens approved the creation of a water district.

Trask asked if the overcrowding was due to the Comprehensive Employment and Training Act (CETA) workers and received an affirmative reply. Selectman Lester Bickford suggested that possibly if really needed a portable office could be used for a short period of time. However, he said he felt "it is a bad time [illegible] additions to the town office, maybe when employment and the economy level out we can plan such an addition." Selectmen then voted unanimously not to include an article requesting additional office space.

ANOTHER article approved was a request for a bookkeeping transaction for the assessor's office. It would mean no increase in appropriation but require a transaction from surplus to the assessors account of $5000. The $5000 in the surplus account came for the CETA funding for the assessor.

An article requesting the appropriation either from surplus or federal revenue sharing of $1000 for the use by a bicentennial committee to be appointed by selectmen was unamously approved by selectmen.

Chairman of the board, Frank Pray Jr., said that money and plans for a celebration could be coordinated with the Shriners who will be holding their meeting in Newport next June.

Selectmen requested Miller to investigate traffic problems at the Log Cabin Diner and also at the intersection of the Stetson Road and the East Newport Road.

Citizens requesting at the meeting to have the pipe stumps on the sidewalks of Main Street removed as a hazard, learned the project was already listed to be done.

Police Chief Charles Hawkins asked Selectman Trask, who is also an employe of the Greyhound Bus Company, if the bus stop could be moved from Main Street to the Newport Inn when it reopened to cut down traffic problems on Main Street Trask responded that it was already under investigation.

Selectmen also voted to send an abatement order to Harley Rines concerning his malfunctioning septic system.

They also voted after a short discussion to change the town's fiscal year from Feb. 1 to Jan. 31 to Jan. 1st to Dec. 31st.

A request from a resident of Camp Benson to have the fill placed at the beach area at Camp Benson removed was denied until, according to Lester Bickford, selectmen, other sources such as the Lake [illegible] or state officials [illegible].

The Camp Benson resident also commended the town for the cleaning up of one lot by CETA crews.

E. N. NASON, a resident, requested the selectmen to publish a book listing the tax property, who owned it and last year's tax amount beside this year's for comparison. Nason said "there is considerable talk on Main Street that those who hud been vocal in recent months had been shut up by having their taxes lowered." Nason also asked about the $10 million dollar increase the revaluation company says the town is worth, compared to the $17 million valuation set by the state.

Miller responded that he already had spoken to state officials who said "we would not use revaluation companies but will use town's valuation." A request that a member of the State Tax office, Carl Lowe or Norman Ladue attend the next selectmen's meeting, was approved.

David King, local tax assessor, said nothing is decided yet as hearings are still being held.

RESOLVE, Board of Selectmen Position on Proposed Sebasticook River Basin Water Quality Management Plan.

WHEREAS, the waters of the Sebasticook River drainage are of low quality and is probably the lowest overall for a drainage of its size in Maine; and

WHEREAS, Sebasticook Lake, a highly eutrophic impoundment, continually receives phosphorous from Dexter and Corinna; and

WHEREAS, Lake Sebasticook is the largest lake in the U. S. within the boundries of one township; and

WHEREAS, the Town of Newport has a strategic location on Interstate 95 and several main routes leading in all directions of the State; and

WHEREAS, our summer recreational program consists of a Red Cross swimming program conducted at a public beach of Lake Sebasticook; and

WHEREAS, Lake Sebasticook at one time was the center of activity and a popular source of recreation with a sailboat fleet as well as the usual rowboats and canoes; and

WHEREAS, the Sebasticook River was originally the most important travel route between the two great river systems of the Kennebec and Penobscot and canoe trips were extremely popular; and

WHEREAS, the beauty of the lake and it's popular landing sites once inspired a sea Capt. to bring to the lake a steam boat (with a capacity of sixty persons) to be rented for moonlight cruises, lake excursions and fishing parties and became so popularized that, within ten years, there were a minimum of twenty steam and Naptha Launches and construction of a fifty foot boat; and

WHEREAS, Newport used to boast of its excellent fishing with a small party on a steamer catching over four-hundred fish in one afternoon including a five pound Bass; and

WHEREAS, Camp Benson, now closed, was a famous lake resort in the early to mid 1900's with as many as four-thousand people attending the annual Fourth of July celebrations held there; and

WHEREAS, many recreational camping areas around Lake Sebasticook have lost business or have been forced to close altogether due to the condition of the lake; and

WHEREAS, cottage owners are expressing the need to sell because they feel that they are not getting enough benefits from the polluted lake to justify the increased taxation of shore frontage;

NOW THEREFORE BE IT RESOLVED THAT, the Newport Board of Selectmen expresse its support of the Proposed Sebasticook River Basin Water Quality Management Plan prepared by the Maine Department of Environmental Protection pursuant to the Federal Water Pollution Control Act and especially request priority be given to correcting discharge conditions that affect Lake Sebasticook.

R.F.D. 2 Box 9
Newport, Maine 04953
June 25, 1975

Mr. Steven Freedman
Bureau of Water Quality Control
DEP
State House
Augusta, Maine 04330

Dear Steve,

This letter is in reply to your request for comments on the Preliminary draft of the Sebasticook River Basin Water Quality Management Plan. Those of us who are concerned about the condition and future of Lake Sebasticook are encouraged by the recommendations of advanced sewage treatment for the towns of Corinna and Dexter. From the nutrient data collected during surveys of Lake Sebasticook drainage basin it is rather obvious that the water quality of Lake Sebasticook will not improve and might continue to deteriorate unless the nutrient loading from the industrial and domestic sewage of Corinna and Dexter is removed.

The Sebasticook Lake Association strongly backs the proposal of nutrient removal (either by treatment or diversion) from the Corinna and Dexter sewage. Our concern was reflected by our strong turn out at the public presentation of your preliminary draft at Winslow. The Lake Association was organized last Fall and is still in its organizational stage. It is planning a membership drive and survey of lake property owners for this summer. If we could collect information which would be useful in judging the impact of the lake shore development on the eutrophic condition of the lake, we would be willing to include any questions your office would find useful on our questionaire. We are planning to use a questionaire similar to the one Charlie Rabeni used on Lake Winnecook.

Some of those concerned about the condition of Sebasticook have expressed concern about the additional sampling presently under way. They are concerned because the Sebasticook drainage basin has been sampled many times but nothing has happened after the data was collected. From my reading about the eutrophication process and attempts to plan a restoration management policy, I, personally, realize that there is never enough information available. Thus, I for one wholeheartedly support the additional collection of data since it will increase the likelyhood that any proposed

solution will in fact prove to be sufficient. However, I also hope that this time the collected information will be used to devise a set of recommendations which will be implemented. Hopefully these recommendations will include actions that the town of Newport could take to accelerate the reduction of the nutrients stored within the lake.

Please keep us informed on the progress of the basin management plan.

Sincerely,

Thomas A Hannula

Thomas Hannula, member Board of Directors of Sebasticook Lake Assn.

Appendix VI

§ 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 after 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 uasges 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 disolved 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.