

SUBMISSION TO  
INTERNATIONAL JOINT COMMISSION  
REQUESTING APPROVAL FOR  
RECONSTRUCTION OF FOREST CITY DAM

APPLICATION OF  
ST. CROIX PAPER COMPANY, A SUBSIDIARY OF GEORGIA-PACIFIC CORPORATION  
TO  
THE INTERNATIONAL JOINT COMMISSION  
FOR  
THE APPROVAL OF PLANS TO RECONSTRUCT AN EXISTING TIMBER DAM  
IN THE ST. CROIX RIVER AT FOREST CITY, MAINE - FOREST CITY, NEW BRUNSWICK

.....

TO:

THE HONORABLE THE DEPARTMENT OF STATE  
Washington, D.C.

THE HONORABLE MINISTER OF EXTERNAL AFFAIRS  
Ottawa, Canada

For Transmittal to:

THE INTERNATIONAL JOINT COMMISSION  
Washington, D. C.

THE INTERNATIONAL JOINT COMMISSION  
Ottawa, Canada

St. Croix Paper Company, a subsidiary of Georgia-Pacific Corporation (hereinafter called "the Applicant"), respectfully represents:

Status of the Applicant

1. The Applicant is a corporation incorporated and existing under the laws of the State of Maine with its principal place of business in the Village of Woodland, in the Town of Baileyville, in Washington County, in the State of Maine.

2. The Applicant is authorized and empowered, inter alia, to acquire and hold water rights and privileges, develop, use and supply electric power, and to do all necessary or incidental things in connection therewith.

3. The Applicant is in a position financially to carry out the proposed works hereinafter referred to.

4. The St. Croix River forms a portion of the international boundary line between the United States and Canada, or between the State of Maine and the Province of New Brunswick, and is a boundary water within the meaning of the Treaty between the United States and Great Britain relating to boundary waters and questions arising between the United States and Canada, hereinafter referred to as the Treaty.

5. The Applicant owns, operates and maintains a mill for the production of newsprint paper and kraft pulp in that part of Baileyville known as Woodland in the State of Maine on the St. Croix River. The Applicant together with The Sprague's Falls Manufacturing Company Limited, a corporation duly incorporated by Act of Parliament, Canada, owns, operates and maintains a dam in the St. Croix River at said Baileyville, which was constructed prior to the Treaty, and also a dam in the St. Croix River at Grand Falls situated in the State of Maine and the Province of New Brunswick, which was approved by Order of Approval of the Honorable International Joint Commission under date of November 9, 1915, and reaffirmed with certain revisions by Order of said International Joint Commission, dated October 6, 1931, to which Orders reference is hereby made and the same are incorporated herein by said reference.

(see the submission to the International Joint Commission requesting approval of the reconstruction of Vanceboro Dam and dated March 1, 1964. Approvals from the War Department and the State Department of the United States are included in this file.) These dams are the largest on the St. Croix River and are of permanent concrete construction. They are used for storage of water and production of power.

6. The Saint Croix Water Power Company is a corporation duly incorporated by special statute of the Legislature of New Brunswick, with power, inter alia, to store water and under certain conditions to "take such land and such material as may be necessary for erecting and maintaining its dams and other works" subject to the payment of damages. All the stock of The Saint Croix Water Power Company (of New Brunswick) is owned by the Applicant.

7. The Applicant is the owner, on the United States side of the St. Croix River, and The Saint Croix Water Power Company (of New Brunswick) is the owner, on the Canadian side of said river, of the storage dam situated at the foot of East Grand Lake at Forest City, Maine, and Forest City, New Brunswick, said lake being a part of the so-called Chiputneticook Lakes, otherwise described as Chiputneticook Lakes. This dam is the subject of this application. It is situated upstream from the dams described in Paragraph 5 hereof and is an integral part of the developed international reservoirs on the St. Croix River. It provides storage facilities for water used to produce power by the manufacturing plant at Baileyville, Maine and the power station operated by the New Brunswick Electric Power Commission at Milltown, New Brunswick, and acts as a protective

or controlling works in time of flood or freshet for the dams described in Paragraph 5 hereof and for other works on the river below them, and is undoubtedly one of the "storage dams" referred to in Paragraphs 3 and 6 of the Order of the Commission dated November 9, 1915, as reaffirmed and revised by Order of the Commission dated October 6, 1931, relating to the Grand Falls dam.

8. The Applicant is currently making a submission to the Federal Power Commission, requesting that a license be issued to cover the operation of the new Forest City Dam structure.

Concise and General Description of Project

9. Construction of a new concrete structure with fishway is contemplated as replacement for the existing timber crib control structure and fishway set in an earth embankment at the outlet of East Grand Lake. The proposed design consists of a concrete spillway and fishway section with an earth embankment at both ends. New motor operated steel gates will have provision for emergency operation by hand.

10. The new control structure will be located within the existing embankment on the International Boundary, where the present timber structure now stands. There will be no change in the maximum or minimum water levels of the past, i.e. 434.94 feet and 427.94 feet M.S.L. Datum 1929 as referenced to RM56 prior to December 1966. Drawdown remains the same (seven feet) and the sluiceway floor will remain at Elevation 427.94 feet M.S.L. Datum 1929. (See Exhibit L attached for reference concerning RM56.)

11. The water levels will be controlled by two 12.0 feet Taintor gates. The new spillway measures 24 feet in width, one foot narrower than the total of the existing three timber gates. The embankment will be raised to Elevation 440.0 feet M.S.L. with a rock berm to Elevation 442.0 where directly exposed to East Grand Lake. The design of the fishway for the new structure has been referred for approval to the Department of Fisheries, Dominion of Canada, and to the Inland Fisheries and Game Department of the State of Maine.

12. The existing dam was built in 1949 of squared untreated spruce timbers. It is eighteen years old and should be rebuilt just as soon as possible and in any event not later than the summer of 1969. The engineering is to be done by Chas. T. Main, Inc., and the plans have been drawn by this firm.

13. The water impounded above the proposed new dam will be used for hydroelectric generation at the plants owned by the Applicant at Grand Falls, Maine and Woodland, Maine. Also the power generated at the New Brunswick Electric Power Commission plant at Milltown, New Brunswick is produced by the benefit of this storage at East Grand Lake. These plants are located approximately fifty miles from the location of the proposed construction and have a total power generation capacity of approximately 15,000 kilowatts plus 6,000 H.P. direct connected. Operation of the reservoir will be coordinated with that of other reservoirs in the system to firm the flow of the river and to provide, to the greatest extent possible, continuous flow equal to the turbine capacity at these plants.

No change in the present operation is proposed. Full spring run-off is retained, with waste only in exceptional years. The reservoir is drawn between June and September, approximately 50 percent or to an elevation as near as possible to 431.94 M.S.D. water being available. After an early date in September, generally described as Labor Day, the balance of the storage is drawn in harmony with the requirement for power generation down river. The Applicant has published a policy statement on the operation of this dam which includes a statement of intention on the part of the Applicant to avoid carrying water during the winter season above 432.94 M.S.D. This is to further the interests of recreation by protecting shore installations which might be damaged by ice formed by carrying the water at a high level during the winter. Frequently there is a partial refill in November and December which is again drawn before the start of the spring run-off. Figure I, attached, shows recorded elevations for the past six years. The range is typical. The Applicant agrees to maintain minimum flow through the proposed construction at the fishway, not less than 75 cfs.

The spillway gates remain partially closed during the spring thaw period, so that the discharge from the reservoir is under control. The reservoir is drawn down in the winter and as previously stated not allowed to rise above 432.94 M.S.D. until the spring run-off occurs. This method of operation provides maximum protection against ice damage to the recreational property on the shores.

The dam structure at Forest City discharges directly into Spednic Lake, which in turn is controlled as to elevation by the new dam at Vanceboro. This dam is licensed under the Federal Power Commission as Project No. 2492.

Figure 2, attached, shows rule curves for the Vanceboro discharge and the regulation of the new dam proposed for Forest City will be operated generally in harmony with the control of the water levels at Vanceboro. However, the general policy of maintaining during the summer months a reasonable head of water on East Grand Lake in the interest of recreation and a maximum head of water during the winter time as a protection to recreational installations will take preference over any regulation of the Vanceboro storage in the interest of power generation.

14. To prove the adequacy of the proposed spillway capacity and embankment height, flood inflow hydrographs were developed from the various sub-areas, with assumed precipitation and run-off rates. From the sub-area hydrographs an inflow hydrograph to East Grand Lake was generated. Three types of storms were considered with the assumptions and results as follows:

Maximum Probable Storm: Precipitation was taken as the maximum probable for the area, over a 24-hour period and 150 sq.mi., as given in U.S. Weather Bureau Technical Paper No.40; total rainfall - 17.7 inches, run-off - 11.00 inches. This was assumed to accompany a hurricane storm during the period July - October, inclusive. With the reservoir at the start of the storm assumed at Elev. 431.8, (which might be expected 50% of the time), the results were:



Maximum Inflow	-	85,000 cfs
Maximum Outflow	-	1,900 cfs
Maximum Reservoir Elev.	-	437.25
Freeboard to:		
Top of Dike		2.75'
Top of Berm		4.75'

With the reservoir at the start of the storm assumed to be the maximum of record during this period, Elevation 434.8, the results were:

Maximum Reservoir Elevation	-	439.2
Maximum Outflow	-	2400 cfs
Freeboard to:		
Top of Dike		0.8'
Top of Berm		2.8'

Snow Melt Storm: 100 year rainfall, as given by Technical Paper No. 40, (5.0 inches) was assumed to occur over an average snow cover (5.0 inch water content), producing 7.0 inches total run-off. During this period the reservoir is kept down in anticipation of the spring fill. Assuming the reservoir is at the average level for the period, Elevation 430.7:

Maximum Reservoir	-	Elev. 433.4
Maximum Outflow	-	1160 cfs

Assuming the reservoir at the level which is exceeded 10% of the time, Elevation 432.9:

Maximum Reservoir	-	Elevation 435.5
Maximum Outflow	-	1700 cfs
Freeboard to:		
Top of Dike	-	4.5'
Top of Berm	-	6.5'

Storm with Reservoir Full: A storm approximating 1,000 - year frequency, as given by Technical Memorandum No. 40, was assumed to occur with the reservoir full; total rainfall - 6.5 inches, total run-off 4.5 inches.

The results were:

Maximum Reservoir - Elevation 436.5  
Maximum Outflow - 1850 cfs  
Minimum Freeboard - 3.5 feet  
to top of dikes

It is apparent from the above that the proposed project will afford substantial flood control.

15. The reservoir is available to the public for all recreational activities without discrimination. St. Croix Paper Company cooperates fully with the Maine Department of Inland Fisheries and Game and the Canadian Department of Fisheries regarding conservation.

16. We are including with this application the general plan of the proposed construction showing the proposed structure in plan and sections and the arrangement of cofferdams for the diversion of water during the construction period. The estimated duration of construction is planned for approximately 8½ months to start just as soon as water is under control in the spring. Exhibit L attached hereto.

Construction Time Schedule

Forest City Dam

<u>Item</u>	<u>Period</u>
Diversion Control Structure & Channel	March 1 to April 1, 1969
Cofferdams & Unwatering	April 1 to May 15 "
Remove Existing Structure	May 1 to June 1 "
Spillway and Fishway Concrete	June 1 to Aug. 15 "
Embankment	July 1 to Nov. 1 "
Remove Cofferdams & Divert Flow	Aug. 21 to Sept. 1 "
Remove Diversion Structure	Sept. 1 to Sept. 15 "
Install Gates & Hoists	Sept. 15 to Nov. 15 "
Begin Regulation thru New Gates	Nov. 15

17. The plan of construction will include cofferdams so arranged as to implement the drawdown with no detrimental effects to downstream owners or residents of East Grand Lake who own and operate summer properties. The drawdown will start in the spring of 1969 and will be accomplished according to our usual and customary plan of operation, as herein described.

18. We cannot visualize any possibility of their being resulting damage to persons or property in connection with the proposed construction activities, but if there be claims which are found to be valid the Applicant assumes responsibility.

19. The Applicant will bear the cost of construction of the proposed dam and no part of this cost will be borne by the governments of the United States or Canada.

20. The Applicant is including with this application a map of the St. Croix River basin showing the location of installations for water storage within the watershed.

21. The Applicant also wishes to stress the importance of this construction with reference to the prosperity and safety of the watershed. We have previously pointed out that it is fast becoming time to renew this structure which was built in 1949. We hope that the Commission will find it possible and advisable to give this application its early approval, so that we may be in a position to proceed with the construction not later than 1969.

Respectfully submitted and dated this first day  
of July 1967.

ST. CROIX PAPER COMPANY  
a Subsidiary of  
GEORGIA-PACIFIC CORPORATION

By: 

President