Rainy Lake & Namakan Reservoir Water Level
International Steering Committee

FINAL REPORT AND RECOMMENDATIONS

VOLUME TWO

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VOLUME TWO -- APPENDICES

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APPENDIX A

PUBLIC COMMENT SUMMARIES

AND

COMMENT LETTERS

PUBLIC COMMENT SUMMARIES

RAINY LAKE / NAMAKAN RESERVOIR WATER LEVEL

INTERNATIONAL STEERING COMMITTEE

SUMMARY OF ALL RESPONSES (Questionnaires and Public Meetings)

1. Which reservoir do you have interest in?

   Rainy/Both: 269 Namakan: 94

2. Do you support the Steering Committee proposal?

   Yes: 301 No: 53 Undecided: 9

I. QUESTIONNAIRE COMMENTS

A. Rainy Lake Comments

1. Yes. I live right by the Ranier lift bridge. I am really glad the water levels are being studied.
2. No. Our concern as homeowners on Rainy Lake is the increased potential for damage by ice to our dock system; we do not feel this issue has been adequately considered.
3. No. Stable summer dock levels (at levels we anticipated when we built them) is important not to mention the value of the property, etc.; let the wildlife fend for itself.
4. Yes. I appreciated the meeting at R.R. College; I also appreciated Paul's presentation. Also appreciated Tom Worth taking the time to talk and give me more information on this; we are in the flood plain by City Beach.
5. Yes. As a sailor, with a center-board boat, the levels are no problem, either way. But, I feel that lake levels should benefit wildlife as much as possible.....
6. No. As a resident of the Sand Bay Area any increase in the possibilities of flooding are of great concern. If the dam operation could be more timely in response to levels consideration to your plan could be an option. Since history of the dam operation shows this can't happen, we can't allow any increase in flooding chances.
7. No. Any potential for flooding in June-July should be avoided. It would be risky to maintain high levels during those months. The 1950 flood was bad!
8. No. You have my comments in previous letters, etc.
9. No. There are other ways to support the fisheries than to interfere w/ the lake levels; those of us who live on the lake need to be listened to and not ignored on this. Enhanced dock access in the spring is not going to happen when there is still ice on the lake until late April or May. Also, to have the level decreasing in June w/ a steady drawdown all summer will mean that docks will be even less accessible by the end of the summer. I hope you will listen to those of us who are most directly affected. Also, the potential of damage to boats due to hitting rocks will be increased -- are the insurance companies supposed to take on this increase in risk?
10. Yes. We strongly agree with the steering committee proposal to adopt new water level parameters to help increase fishery and other wildlife reproduction.
11. Yes. Better for nav. & docking; better spawning conditions.
12. No. Prefer Rainy to be higher during the summer. I'm a sailor and hate hitting those rocks!
13. Still undecided. What was motivation for any alteration? Originally the VNP said it wanted "natural" levels regardless of side effects. Have environmental reasons now become more palatable? How valid is datum re: improved fish production? What is more significant: fishing or general navigation?
14. No. I'd like to leave the rule curves as is. The risk of flooding will be greatly increased with the proposed curves and the lower water levels in Aug. Sept. and Oct. are too low for safe navigation during the windy days. Large craft will not be able to access ....dock..

15. Yes. I believe that the artificially high levels of the lake are damaging the spawning grounds of the walleye -- anything we can do will improve fishing and, of course, along with this, tourism I would like to see the levels even lower.

16. One other feature that must be taken into consideration is wild rice -- I believe a better control of levels would be beneficial for this crop, a must for aquatic birds.

17. This proposal might also help to prevent the spread of cattails in early summer.

18. When mother nature allows? 1. lower in the fall, 2. higher in the spring.

19. Improving fisheries should be a priority and will benefit the most people. This proposal appears to have minimal effect upon lake property owners and hydropower generation.

20. The thing that bothers me now is that sometimes I'm sure they are not monitoring the rate at which the lake is heading toward the curve limits. All of a sudden they seem alarmed by the fact that the lake is going up or down too fast and is at the curve limits. Surely, they should keep a closer watch on their data. Most important is the use of my boat in and out of my piers or lift. Don't screw up!

21. The lake level has to be controlled so its in the best interest of all, including our natural resources. Good fishing is good business.

22. My son owns a home on Rainy Lake. We spend a lot of time on the lake both summer and winter. The proposal suggested by the water level steering committee makes a lot of sense. I hope it is supported.

23. Our ducks are down, our fish are going down, were doing something wrong so let's try something different. Lets try Rainy Lake sportfishing way. Also, freezing in the fall to high water level, the ice freezes to our docks and in the spring the water level drops and puts a lot of weight on our dock and raises heck with them.

24. I do not have enough water at my dock in the summer anyway! The government is getting more and more strict on lengthening docks all the time.

25. The lake level was way too high this past year as is known by all the dock repair. We should be able to help the fish, etc. and still maintain safe water to protect our docks, and not have all the flooding downstream because the level was held too high for too long.

26. Should also help whitefish hatching on Namakan! Keeping water higher in the fall!

27. This is vital, in my opinion.

28. Yes. I strongly support the steering committee's proposal and the new lake level rule curve for Rainy Lake. The enhanced dock access and improved habitat for fish and wildlife for outweigh the shortcomings of the proposal. Please get on with the process and implement the new proposal as soon as possible. The spring of 1993 would be a great time to start!

29. Yes. I am interested in the potential benefit to wildlife.

30. Please keep lake levels on Rainy Lake on same curve. Damage to docks in the spring would be bad. Everyone's docks and shorelines and water uses at shoreline are now developed for this curve. If changed, would create a lot of hardship.

31. No. Most concerned about docking at lake property.

32. This is to advise that we support the current rule curves established on Rainy Lake in Koochiching County. We are strongly opposed to the proposed change to this area's lake levels.

33. We have a cabin on Tilson Bay at Rainy Lake. We have heard that there is a possibility the lake level may be changed in order to improve the fish population. If that would improve the fishing, we are very much in favor of a change. We do hope though that the lake level can be nearly "normal" from May 15 to Oct 15. Since our bay is shallow, low water during the summer would adversely affect us.

34. Yes. The benefits tend to outweigh the negative aspects. Boise must cooperate!

35. Yes. It sounds like a great idea. It's worth a try to improve things.

36. Yes. Fishing will improve.

37. Yes. My cabin is on Crow Rocke Inlet (Rainy Lake), the fishing has dropped off. Marked by a drop in resort use and quality of fishing for local residents. The proposal is sound and should be tried.

38. Yes. As a local sportsman/fisherman, I support the controlling of levels on Rainy Lake to optimize the natural breeding cycle.

39. Yes. Multiple use waters must be managed for the good of the wildlife too!

40. No. I live at 3 Points. No. between Ranier Bridge and Dam. When Boise holds high water they then open all the gates and drop our water level 3' in 24 hrs. Also this makes the rapids and bridge area current dangerous.

41. No. I do not wish to see any lower levels in the fall of the year than we now have.

42. No. Restricts areas that my sailboat will be able to sail in or around. Should this proposal become law, we may have to sell our boat or leave the area.

43. No. Would dry dock, or at best, barely float my boats at existing dock (early July through Oct.) Also would limit my navigation options for my sailboat.

44. No. There is not enough knowledge about increased weed growth due to the shallower water during the summer months. Moran's Bay, where my cottage is located, is very shallow, (6'-8'), and if the levels are reduced it will increase weed growth, resulting in poorer water quality and make recreational usage much less attractive. If there is more vegetation growth it will die and cause an increase in bottom sediment covering the existing hard base. This could turn the whole by into a stagnant swamp. I would like to talk to someone who could provide more information about this situation.

45. Yes. Long over due!

46. Yes. Seems neither proposal has positive affects on aquatic vegetation? I think the improvement to fish and wildlife habitat is well worth a hydro production decrease (small). I don't mind high water in the spring, but it is hard to estimate the potential for spring ice damage, this may be a hard thing to accept.

47. Yes. As long as the summer drawdown isn't too drastic - our beach is large enough and our bay is very shallow as it is. (The presentation at the firehall was excellent).

48. Yes. And close walleye season from about Feb. 1 to May to save large spawning walleyes.

49. Yes. Its much easier replacing a dock than replacing nature. Who cares if a dock becomes an endangered species?

50. Yes. Regulate water levels to benefit pickerel spawning, beds and survival.

51. Yes. After reading your yellow brochure of a year past, I had the impression that there would be significant water level changes on Rainy Lake with resulting property degradation. If I interpret the proposals shown in your MNR Scott Street display correctly, my original worries were unfounded and I can support the committee's proposals. I continue to entertain the belief that a very rigid application of fish and wildlife laws are required. Perhaps I missed the section in your display dealing with restocking. This surely can do no harm when done with selective regional temporary cancellation of fishing. The fish situation in Rainy Lake and associated lakes is analogous to the eastern cod fishery problems. By severely limiting catch limits and enforcement of game laws, we will be able to avoid the draconian 2 year (plus?) embargo on fishing that has occurred in the cod fishery.

52. Yes. Benefits to lake ecosystem far outweighs risk of and damage by a few years of higher water levels.

53. Yes. Help the fish and wildlife as much as possible.

54. Yes. Interested in fish and wildlife habitat.

55. Yes. It is time the local resident has some say in establishing water levels. Not some guy behind a desk in Toronto that thinks Ontario ends at Sault Ste Marie.

56. Yes. We thank you for thinking of people who can't dock in the spring.

B. Namakan Reservoir Comments

1. Yes. Stop the talking and get on with the doin'!

2. Yes. The proposal looks good for every one. Thanks.

3. Yes. Cabin owner on Crane Lake. Protecting and rejuvenating the environment needs to be the 1st priority!

4. Yes. Buoy rocks properly. Allow docks to be rebuilt to fit lower water levels for July to Sept.

5. Yes. Our business is affected by low water. it scares people away from our area.

6. Yes. People will not come up in May because of low water. Our business is affected by low water.

7. Yes. This should've happened years ago and Boise Cascade shouldn't benefit from power generation on public water. 95% of other lakes in Minnesota are not drawn down to the extent that we are -- lets be fair!

8. Yes. Previously the water levels were lowered too much in the fall/winter and raised too high in the summer.

9. Yes, to an extent, but water level should be kept higher also in July and August to allow adequate navigation thru Loon River to Loon and LaCroix. Also keeping fairly constant high water level will prevent runoff of mercury contaminated ground water as has been theorized. Hazards of possible spring flooding and dock damage probably won't be too severe.

10. Yes. My main concern is the crappie, walleye fishery -- also bass and northerns. Anything that will help fishing I'm for and willing to pay for.

11. Yes. Landowner on Ash River.

12. Yes. Landowner on Ash River.
13. Yes. Helps fish population and resort owners.
14. Yes. Water level too low in the spring.
15. Yes. The water level sticks the way you now have it.
16. Yes. Dock out of water horse shit for spring.
17. Yes. I believe that minimizing the effects of the large variations in the Namakan Lake level is going to let nature take its normal course.
18. Yes. We need more water in the spring time. It will be better for the environment.
19. Yes. We need a change like this now!
20. Yes. We need more water in the spring time, period!
21. Yes. Our lake is too low in the spring. Give us more water!
22. Yes. There is a definite need for the environment to have higher water levels in the spring time.
23. Yes. Get real!
24. Yes. We need more water in the spring time! It will help wildlife and fishing.
25. Yes. Let Voyageurs Nat. Park voice our opinion -- past and present is unacceptable of those old rules. Guided (50 years) out of these waters. Throw out all those old rascals on these committees -- we don't know who they are and why are they on these committees. For who's gain may I ask?
26. Yes. Benefits outweigh the shortfalls. Water level stabilization is good for wildlife and navigation.
27. Yes. I feel it is unnatural (the water level fluctuation); try to keep it a bit more constant.
28. Yes. Proposal seems more realistic and reasonable and eliminates serious drawdown which has been very detrimental.
29. Yes. Significant benefits outweigh negative. Proposal's adoption would be a boon to fisheries -- early season navigation, wildlife, et al. General support by many groups indicates additional strong reasons for adoption.
30. Yes. Boise needs to be more responsible to the natural resources. There should be a better balance, than what exists today.
31. Yes. Earlier high water will substantially increase the traffic in late May and early June!
32. Yes. Just what we need on Namakan Lake. Fine job.

C. Comments Relating to Both Lakes

1. Yes. Our fishery is in trouble. Any change in water level management that improves fish and wildlife habitat will have my support
2. Yes. I feel that if we are ever going to improve the resource (fish) that this rule curve must be implemented. All other methods will help but we must improve the habitat to be successful in the long term.
3. Yes. The environment for fish and wildlife should take precedence over hydro-power interests.
4. Yes. The proposal seems like it would be better for fishing which is good for tourism.
5. No. Our concern is dealing with dock damage during the spring and fall. It is a expensive burden to bear.
6. No. There is nothing wrong with the present system.
7. Yes. If there is anything I can do to help this proposal go through please contact me.
8. No. Regarding Namakan, the S.C. proposal could be somewhat beneficial because it ... for less fluctuation than the present plan. But I feel that any artificial control or regulation is bound to be detrimental to the natural course of events. I feel that the whole R.L. watershed would have been better off if no attempts to regulate nature had occurred.
9. Yes. This year, with the high water, we have lost 2 feet of beach, and are dreading the damage the ice will do. Something has to be done for people and fish.
10. Yes. I don't think we need the reduction in August and September as proposed by the committee.
11. Yes. I'm disappointed that the magnitude of change on Rainy wasn't greater. It seems human comfort takes priority irregardless of the cost. When one builds on a floodplain one should expect to get wet once in awhile.
12. I feel the water levels need to be watched closely and it will benefit all!
13. Let's do everything possible to rebuild the walleye population.

14. We need to think seriously about the continuance of wildlife and fish resources if we expect our children to enjoy the same. The proposed rule curve change on water levels would help us keep our resource, providing we're willing to sacrifice other minor concerns.

15. The water level steering committee is on the right track. I believe we should have a fish hatchery on Rainy Lake. There is too much pressure on the fish.

16. There has to be a balance between wildlife needs, sportsman and industry. And there is a definite need to work closely with these groups to achieve common goals.

17. I have helped plant fry and fingerlings in early spring and definitely have seen a greater increase in the amount and size of fingerlings -- if we can control the amount of water and the levels there should always be a good stock of walleyes.

18. I believe this is a very good proposal and hope that the Int'l Water level Steering committee takes it into consideration and tries to work with it!

19. Yes. I am very excited about the possibility that wildlife (loons, walleye, etc.) will have a better chance of reproductive success. The highest value of controlled water levels should be to protect wildlife. I can replace my dock if it should be flooded out, but I can't make (replace) a loon!

20. Yes. I am a property owner on Rainy Lake. I favor replicating the natural cycles to the greatest practicable extent. In that regard the steering committee's proposal is acceptable.

21. Proposal looks good!

22. Yes. Anything you can do to improve fishing #1 and wildlife habitat #2 - we'll take the damage to docks, etc.

23. Yes. I believe the steering committee's proposal must be supported. Our fishery, especially our walleye fishery, is currently in poor condition and only through natural propagation will it improve. The Border Lakes Task Force (on Rainy Lake) recently formed has recommended changing lake levels for fishery improvement.

24. Yes. The are a number of state-wide or national groups that I belong to, or am on their board of directors, who would support this recommendation to the IJC, particularly because of its wildlife benefits: Audubon, Sierra, National Wildlife Federation, Great Lakes United, Minn. Parks and Trails Council, etc. Would you please send me 10 more copies of the Executive Summary of the Public Review Draft, June 1993, and any other pertinent information. I also need to know to whom letters of support should be sent and what is the best timing of letters to influence the IJC's decision. It also would be helpful to know who the Clinton administration's appointment to the IJC are and what their backgrounds are. I stayed at Tim Watson's resort over the weekend and he said you were the best source of this information.

25. No. At least 7 docks on our side of the Jackfish Bay were lost because of the spring ice. We would have too much investment to lose. Also I believe this up and down is no good for anything. You should try and keep the lake level stable and not wait until we are flooding before Boise opens any gates. Right now (July 1993) the lake is 1107.74 and your chart shows 1108 which will be 6 inches higher and as it is now all the docks stringers are already in the water. So I do not support your plan.

26. Yes. It sounds wonderful. It would be great for fishing.

27. Yes. Good for walleyes.

28. Yes. A water level following a natural situation would benefit the lakes.

29. Yes. Best thing for fishery.

30. Yes. This would improve the spawn.

31. Yes. This lake is here to benefit many more people that use it than to benefit a business -- majority wins. The fish need to be considered before this becomes a dead sea.

32. Yes. I operate the Hardees in I. Falls. The success of my business depends on the tourism coming here; without fishing we would have none.

33. Yes. These proposals will enhance wildlife and fishing resources for the above-mentioned reservoirs. These levels are designed with all these factors in mind. Thank you.

34. Yes. Rainy Lake and Namakan should be regulated in this priority: (1) walleye natural reproduction; (2) waterfowl and aquatic life habitat; (3) cabin and resort owners (docks, ramps, beaches, etc); (4) power generation (hydro dams).

35. Yes. We need the change if we are going to improve the fishing on both reservoirs.

36. No. You don't make much of a case for any change.

37. No. More stable water levels will protect other water systems. We've concerns about effects on Seine floodwaters and impact upon walleye spawning.

38. Yes. I believe this will improve the environment that fish and water birds need to flourish in our lakes. Good plan!

39. Yes. Water levels should be considered by the environment. There has been a great deal of controversy over this matter. The dropping of the water to that degree has to be criminal and should be dealt with in the courts. They have no consideration to animal, insect, and human life. That is way our country is so screwed up. They should have better controls when and why they are lowering the levels at dam.

40. Yes. Don't take no for an answer from Boise.

41. Yes. The time of commenting is over. It is time to act and I hope it isn't too late.

42. Yes. Worth a try.

43. Yes. Will co-gen plant help Boise's power needs, i.e. has an independent study been done lately to see how much extra power would have to be purchased?

44. Yes. I believe it is time we try and give back to nature what we have taken.

45. Yes. Take care of the environment, not abuse it for money.

46. Yes. Like to see improved fishing and wildlife.

47. Yes. I think we should be more concerned with spawning conditions for walleye and northern pike and bird nesting conditions. Less priority to hydro power, navigation and docks.

48. Yes. I support these levels and I hope there instituted as soon as possible.

49. Yes. Would there be any danger to lake travel in winter (snow machine, truck, car, atv) due to bad ice?

50. Yes. And, would like to see water levels on Lake of the Woods more stable.

51. Yes. I am for what it will take to improve the fish and wildlife on both lakes.

52. Yes. Go ahead.

53. Yes. As long as human and wildlife are looked after evenly, do your best.

54. Yes. I'm concerned about both reservoirs. Yes I support the committee's proposal. However, in order to put into action this proposal I would like to see the committee work with the Lake of the Woods water committee. It certainly would defeat what you're trying to accomplish if you transfer the problems from our area to those of Lake of the Woods. Lake of the Woods is complaining now of high water levels and we'd be adding to it. I did some research and that's why I'm late with my response. There was a news article on T.V. to this affect (high level on Lake of the Woods) as well. Thank you.

55. Yes. Excellent work!

II. PUBLIC CONSULTATION MEETING COMMENTS

A. September 23, 1992: Namakan Reservoir Meeting

1. 100% on target

2. I support the proposed changes, easier access for boaters; benefits for northern and walleye reproduction.

3. Too much time delay as to when the dams should be opened or closed; a week after the flooding is not the time to finally open the dam. The DNR should allow dock rebuilding when water is down or up.

4. Not staying in the curve, or better, not reacting fast enough to lower or raise water levels. It bothers me we are dependent on one entity to control water in a timely manner, Boise.

5. Some support for those who might be affected by the changes. (Concerned) that there is better management of the dam. And that all agencies concerned -- DNR, Park, etc. -- closely monitor the effects on not only wildlife, fish, etc., but also the consequences to resort and home owners on the lakes.

6. A closer look must be taken as what damage will be done by ice if the water is too high during winter and also in the spring.

7. Considering DNR and government permits to rebuild damaged docks or to dredge a foot of lake bottom in order to accommodate new water levels, we don't need the hassle by bureaucrats to hold to old ideas in a new situation.

8. Need something in black and white giving authority to modify docks, etc. in emergency.

9. Decline from June 1 peak to September needs to be greater at least 1/2 foot per month to really improve walleye and northern stocks.

B. September 24, 1992: International Falls (Rainy Rake Community College)

1. Need more time to think this through. I appreciate all the work you've all done. I realize there are many people to satisfy. My personal concern is for homeowners on the lake: the cost of repair for damaged property in an effort to get better fishing is hard to swallow. Also, as a business family, I am probably one of the few concerned for Boise. I too am concerned about the poor fishing.
2. I live on Sand Bay east of Ranier. My biggest concern is the increase of flooding in the spring! I do feel lower levels throughout the summer would be much better.
3. As a homeowner in the city beach area I am extremely concerned about the tripled chance of flooding. Shore soil is not rock in our bay as is typical of a majority of the lake, thus erosion is much more prevalent. I do support the fall drawdown but I remain concerned about the spring curve.
4. I feel that the diversity of plant and fish populations in Rainy and Namakan are a greater concern than the potential for floods and docks being torn out. I also think Boise is blowing smoke when they start crying about losing 250 thousand dollars in hydro a year. I think that their actual concern is liability in case of flooding.
5. I was sent as primary representative of the 800 member Rainy Lake Sportfishing Club who wholeheartedly support this committee's proposal as it stands.
6. Maintaining minimum flow in the river in early spring -- water quality? Loss of docks in spring due to water rise before ice out -- not acceptable; increased chance of flood in spring not acceptable; increased weeds not acceptable.
7. The increased potential for flooding will cause more property damage. Docks, buildings and shoreline will be subject to damage more frequently and likely more severely. Lowering the water earlier in the fall should be a plus for fish and not impact property owners.
8. Benefits doubtful. Leave levels as they are. DNR should propose a fisheries to help fishing on Rainy and other lakes in the area. Rainy Lake fished out commercially from 1940-1950-1960 and 1979; take a while to build them up again.
9. While I feel some compassion to the lakeshore homeowners, the entire ecosystem must take first priority. After all, the fish, wildlife, and flora were here first. If we allow Rainy Lake to become sterile, all people who love the area will experience a spiritual loss.
10. Any proposal that increases the risk of dock damage and flooding is not acceptable to me. Suggest you compare the effect of reducing the fish limit by half with the committee proposal for changing the rule curve. It is important for the committee to get more input from the lakeshore residents. Many of my neighbors were not aware of the committee and its proposal.
11. Who will pay for flood damages? Even with the current curve kept lower all the time would be just fine. In 52 years on Rainy we have had good (not the past 10 years) fishing.
12. Keep up the good work!

C. October 6, 1992: Crane Lake Area

1. If the water level is brought up too early doesn't this reduce the vegetation growth? What is the review process to change this proposal if after a few years it is found to be bad for fish as well as vegetation and navigation? I'm all for the early increase in the rule curve, what we really need is a better fish population, but we do still need navigation up Loon River.
2. I support any actions that improve fish habitat within the limits of acceptable navigation. The reduction of winter drawdown and bringing up water level quickly in the spring is desirable. Navigation in the Loon River area is not as important as fish habitat on the Namakan, Sandpoint, and Crane Lake area. But for the good of this community, navigation on the Loon River is an important consideration.
3. Widen the operation of the curve so that in September and October the Loon River would be navigable.
4. I favor less winter drawdown and an early summer drawdown as proposed to improve fish reproduction and minimize lake shore erosion. I feel the 50 year floods will happen anyway. I think you have done a good job researching the facts. Thanks.
5. I do not support the summer drawdown. Risk of flooding is minimal if water level is properly maintained and weather forecasting is observed by the operator. I do support the spring curve if it is proven that it will not cause damage.
6. Your curve would work most years -- but not all! I feel we need the summer water level kept high through most of September for safe navigation of Loon River. The slow drop of water in early summer

will cause problems with the slightest dry spell that may and will occur. Vary the curve yearly with the weather and the water flow of each year, this would keep Loon River open to use and still help with fish spawning. It would be easy to monitor and control with the help of volunteer reporting of river conditions. I'm sure the portage operators would help along with area guides, outfitters and others that use the river daily.

7. The way the new curve proposal is now will be bad for us who run the Loon River for a living. Our fall water is important to us to complete our season. We can give up a couple of weeks in the spring, but not a month or more in the fall. We are willing to work together.

8. Proposed curve could impair navigation on Loon River in low Loon discharge years. Suggestion: expand curve 6 inches. Use operators guide to establish where level on curve or band is maintained depending on Loon discharge.

9. 1117 feet in August will not allow navigation on Loon River.

COMMENT LETTERS

THE CORPORATION OF THE

TOWNSHIP OF MORSON

P.W. GILES, A.M.C.T., C.M.O.
CLERK-TREASURER
BOX 427
RAINY RIVER, ONTARIO P0W 1L0

TELEPHONE (807) 852-3529

July 10,1992

Mr Bill Darby, Co-Chairman
Rainy & Namikan Lakes Water Level Steering Committee
c/o M.N.R.
922 Scott St
Fort Frances,ON
P9A 1J4

Dear Mr Darby:

This is to confirm the presentation to council by Mr D McDougall on July 7th,1992. The presentation dealt with proposed changes to the water level curves on the Rainy & Namikan Lakes. Council passed a resolution in support of the proposed changes and looks forward to the implementation of the new curves.

Trusting that the changes as proposed can be made.

Yours truly,

P.W.Giles, AMCT CMO
Clerk-Treas

July 22, 1993

Rainy Lake/Namakan Reservoir Water Level
International Steering Committee

Thank you once again for giving the public the opportunity to comment on the proposed changes for the lake rule curves affecting Rainy and Namakan Reservoirs.

My first thoughts after reading the June 1993 public review draft and following the steering committee work over the last two years is---why hasn't the proposed changes been finalized and sent to the IJC yet? Let's get on with the program and help improve the lakes and the affected natural resources!

I must commend the steering committee group for their patience, effort and fairness when dealing with the complex concerns involving lake levels noted in the report. It appears an "even handed approach" was used to weigh the benefits and shortcomings of the impacts. Thank you for taking this approach!

I have lived on the shores of Rainy Lake for almost 18 years. I firmly support the proposed rule curve changes as developed by the steering committee. My field observations and review of the report's data firmly sway me to believe that the benefits noted in the report far out weigh the potential shortcomings.

Please get on with the process and make the proposed rule curve changes as soon as possible. The lakes, its natural resources, the lake shore homeowners, and the water recreational users will all benefit from this action.

Thank you.

Raoul Lufbery

Raoul Lufbery
Rt. 8, Box 462
International Falls, Minnesota 56649-9627

NORTH WESTERN ONTARIO
TOURISM ASSOCIATION
P.O. BOX 500, NESTOR FALLS, ONTARIO P0X 1K0

August 11, 1992

Mr. Bill Darby, Co-Chairman
Rainy Lake & Namakan Water Level
Steering Committee
C/O Ministry of Natural Resources
922 Scott Street
Fort Frances, Ontario
P9A 1J4

Dear Mr. Darby:

After reviewing "A New Water Level Proposal for the Rainy Lake and Namakan Reservoirs", the board has the following comments.

The North Western Ontario Tourism Association supports the proposed changes to the water level management of Rainy and Namakan Lakes. We hope that the changes will improve the habitat in these particular lakes.

We would like there to be a review mechanism built into the proposal whereby after 5 years the policy be looked at in light of the actual benefits derived from the management changes. A new policy needs to have flexibility built into it in order that new circumstances or issues can be dealt with as they arise instead of waiting for another complete review process.

Thank you for all of the efforts you and your committee members have put into studying this issue and recommending changes.

Sincerely,

Ken J. Wickstrom
Secretary-Treasurer

August 17, 1992

Dear Sirs:

The Rainy Lake Guide Association opposes any further study on water level changes on the border lakes. We regret the position we take at this time. The resources of our area are of the greatest importance to all of us. All parties involved should be working towards the betterment of the fish communications.

The reason for our position rests solely on the Ontario Ministry of Natural Resources. For seven years they have taken an anti-American stance on resource issues. The discriminatory "User Fee" must be done away with and all people treated equally.

This study has very little chance of advancing if it is surrounded with controversy. We will intervene at the International Joint Commission level either through lobbying efforts or a lawsuit if necessary. All people whether Canadian, American, local or tourist should be treated equally.

Our position is open to change if positive movement is made on resource management issues that are non-discriminatory by all parties involved.

We realize that members of the committee have a great many years and hours they have given to this project. We appreciate the time and commitment you have given and hope for the completion of the study.

The bottom line is Ontario must realize this is not a one-way street. We are willing to participate in resource problems, but not under current conditions.

Sincerely yours,

Billy T. Dougherty

William T. (Billy) Dougherty
President Rainy Lake Guide Association
International Falls, Minnesota

MANITOBA HYDRO

BOX 815 • WINNIPEG MANITOBA CANADA R3C 2P4

1992 08 19

Dr. William R. Darby
Co-Chairperson
Rainy/Namakan Water Level
International Steering Committee
922 Scott Street
Fort Frances, Ontario
P9A 1J4

Dear Dr. Darby:

Re: August 20 Meeting

I received your letter on August 13 requesting my presence at a meeting of your informal steering committee on August 20 in Fort Frances. I wish to advise you that I will not be able to attend because of other commitments and insufficient notice time to plan for it.

Had there been more time, I might have come as an observer, or sent my assistant, Mr. A. D. Cormie. As you may know, I am the alternate member for the Province of Manitoba on the Lake of the Woods Control Board and Mr. Cormie represents Manitoba Hydro and Winnipeg Hydro. As you may also know, neither the Province of Manitoba nor Manitoba Hydro or Winnipeg Hydro have any voice or representation on the Rainy Lake Board of Control, and it may be inappropriate for me to offer input at your meeting.

It recalls to mind the 1969 meeting of the I.J.C. in International Falls, when the rule curves presently being used were debated. That hearing lasted six hours, of which the third and fourth hours were my presentation and cross-examination by the I.J.C. and their technical and legal advisers. The main purpose in my appearing was to focus attention on the fact that Rainy and Namakan Lakes are not isolated, but part of a larger system. Because two-thirds of the water which flows through Lake of the Woods comes from Rainy and Namakan, the regulation and rule curves of Rainy and Namakan have a profound effect on Lake of the Woods and the ability of the Lake of the Woods Control Board to fulfil its mandate. I regret to advise you that my presentation largely fell on deaf ears and the I.J.C. went on to pursue their preconceived objective. The considerable restriction placed on the regulation of Rainy Lake and to a lesser extent Namakan Lake has made the regulation of Lake of the Woods ever more difficult. This is much to the detriment of the many diverse interests on Lake of the Woods, including wild rice, nesting waterfowl, fish stocks, cottage owners, commercial camp operators, municipal and industrial water supply, pulp and paper, navigation and hydro-electric generation. It has also exacerbated the problem of highly variable flows in the Winnipeg River below Kenora, much to the annoyance of the residents and cottage owners around Minaki. I have sometimes declared that Lake of the Woods and the Winnipeg River would be better off if Rainy and Namakan Lakes were returned to a state of

nature and not regulated at all. My appearance at the I.J.C. on behalf of Manitoba Hydro was questioned by one of the members of the I.J.C. because Manitoba Hydro does not have representation on the Rainy Lake Board of Control.

If the efforts of your committee precipitate a new round of hearings for Rainy and Namakan regulation before the I.J.C., it will be the fifth time. In fact, it could be argued that the difficult problem of regulating Rainy and Namakan brought about the creation of the I.J.C. in the first place, as three of the first four problems to be addressed by the I.J.C. back in 1909 had to do with Rainy and Namakan Lakes. As a result of successive rule curves in 1949, 1957 and 1969, the range on Rainy Lake was progressively narrowed to less than half its natural range, but the outflow pattern has been made more variable and less satisfactory. The pollution dilution problem has not been effectively solved.

The building of the Namakan outlet dams by the pulp and paper interests created a waterway safe for small craft all the way from the west end of Kabetogama to the south end of Little Vermilion Lake by drowning out several natural rapids. It is probable that these navigation benefits have never been fully appreciated by small boat and houseboat operators. The paper company now finds itself under ever-increasing pressure to operate its dams for the benefit of others who do not bear any portion of the financial burden of capital, maintenance and operating costs, but which erodes the benefits for which such funds were and continue to be supplied by the paper company.

Apart from the above comments, I feel that it is more appropriate to let the Lake of the Woods Control Board speak on our behalf. In turn, we will relay to the Lake of the Woods Control Board any input to the regulation and rule curves of Rainy and Namakan that we feel may be useful.

Yours very truly,

Peter M Abel

P. M. Abel
Department Manager
Reservoir and Energy Resources Department
System Operating Division

PMA/eeh

PMA92-34.ltr

Border Lakes Association, Inc.

August 19, 1992

Paul Radomski
Minnesota DNR
Box 756
New Ulm, MN. 56073

Re: Proposed rule curve modification to Namakan, Kabetogama and Rainy Lake

Dear Mr. Radomski,

On August 3, 1992 the Border Lakes Association board of directors met to discuss the proposed rule curve changes for the Namakan and Rainy Lake reservoirs. During the course of the board's consideration a number of issues surfaced. Among them, the consequences to various interests on the Namakan and Rainy Lake reservoir as a result of the earlier water level rise in the spring, spring flood potential, the effects on navigation and commerce on all the lakes and rivers including the Loon River.

One central concern expressed was that the changes contemplated may be without sufficient data to demonstrate the consequences from such proposed changes. It would appear that any adjustment will be disruptive to the present ecosystem and riparian owners.

In the event the changes do not act as an improvement on existing conditions it would seem improvident to authorize and support rule curve alterations without independent review. Accordingly, Border Lakes Association will withhold it's support until such a time as our expert assistance has had an opportunity to review all data used to reach the conclusions recommended by your committee.

Sincerely,

James L. Sanborn
President

sb

VALLEY OPPORTUNITIES
THE RAINY RIVER DISTRICT COMMUNITY FUTURES GROUP

P.O. Box 632, Fort Frances, Ontario P9A 3M9

Phone: (807) 274-5484
FAX: (807) 274-6989

September 27, 1992

Bill Darby, Rainy Lake Area Manager
Ministry of Natural Resources
922 Scott St.
Fort Frances, Ontario
P9A 1J4

Dear Mr. Darby:

I am writing to inform you that the Board of Director's of Valley Opportunities Inc. (VOI) tentatively supports the Rainy and Namakan Water Level International Steering Committee's rule curve proposal. The Board would like to qualify its support by requesting that the Steering Committee do its best to quantify the costs and benefits of this proposal.

The costs of making changes should be easy to identify while some of the benefits may be difficult to determine. The Steering Committee should attempt to more clearly identify any benefits of the proposed Rule Curved changes.

As you know on a possible related issue VOI is and has been very concerned about the fisheries on the affected lakes. We think that probably a conservation aspect to the Rule Curve Management regime would be beneficial and add credibility to your efforts.

We would like to thank you for seeking our opinions we look forward further co-operation and input in the future.

Yours truly,
Gary Countess
Gary Countess
Chairman

Funded by Employment and Immigration Canada

Oct 1993

COMMENTS ON STEERING COMMITTEE PROPOSAL

First of all, looking at the list of people on this committee I don't see anyone with the exception of Mr. Tim Watson, that has the experience or keen interest on the lake levels as I have.

I might state I've lived on Rainy Lake since 1934. I've owned property on the river since 1940. I built my home in 1947 and I have a summer lake home on an island on the east end of Rainy Lake since 1960. I have three docks and a boat house on the lake and river. My home is located below the Ranier bridge and above the second rapids. Since July 1957 I've been in charge of the hydro generator at the International dam and the operation of the Kettle Falls dam for Minnesota and Ontario Paper Co. and later the Boise Cascade Corporation. I've seen what has happened in the flood of 1950 and the one in 1968. Unless you have lived day by day watching and working with what has happened you cannot judge by just looking at the records.

Now your proposal on the Namakan Lake, you are not bringing the lower level down low enough in March and April. Namakan can raise an average of 3 to 6 inches a day, and when it raises 4 to 6 inches a day at your proposed levels, even with the gates at the Kettle Falls dam open, you will be in for a flood. About once every 10 years Namakan will come up faster than the rule curve allows and we have wasted water then only to find out that the reservoir never filled up. I do not believe we should start to lower the level of either Namakan or Rainy Lake until after August 21st.

Now one thing to keep in mind is that the spring break up varies from the 20th of April to about the 10th of May. We should not try to raise the lake level much until the lakes are clear of ice. The damage to docks and shoreline could be a real disaster. Also as soon as the ice is out nature in the form of evaporation helps to hold the lake levels down.

The statement of the June levels drowning loons nests I feel is a lot of hogwash. All the loons nests that I've photographed and watched each year are made such that they float with the ups and downs of the water levels.

The statement of killing whitefish and cisco eggs by the falling levels, if the DNR was really concerned about the whitefish then something should be done about getting rid of the suckers in these two lakes. My experience has been when netting whitefish in shallow water in October, for every whitefish in the net there is also one sucker. So the suckers are eating the whitefish eggs as soon as they are being laid. Having a May 1st date for spearing suckers should be moved up a week or so in April, also the DNR should hit the rivers in the spring and net some of the suckers.

The statement about aquatic plants. When the aquatic plant life gets going good that is the beginning of the end of a lake. Northern Minnesota with all its swamps is a good example of what used to be lakes until aquatic plant life took over. The low levels of Namakan and Rainy Lake during the late 70's and 80's has caused many shallow bays and rivers to let the sun rays

penetrate more in the shallow water and caused plant life to grow tenfold. Even Rainy River below Ranier bridge now has weeds growing in the water in large areas where we've never had them before.

Rainy Lake has a surface area of 345 square miles and drainage area of 14,500 square miles. Namakan Lake has a surface area of 104 square miles and a drainage area of 7,200 square miles. When we have heavy rains in the area it could take as long as two weeks before we feel the full impact on Rainy Lake.

I believe some of the reasons we sometimes go over the rule curve is that Mr. Jim McQuarrie and his boys at the Fort Frances mill don't watch or anticipate what will happen until the lakes are full or over the rule curve before they act. The job of watching the lake levels has been delegated to the youngest engineer in the engineering department. During my time with Boise, most of my dealings have been with Mr. McQuarrie or Mr. Les Cain. Now that is my opinion but I'm sure that they have their just reasons why they operate the way they do.

Although I retired on October 1, 1982 I still watch the levels every day at my home, or when I'm up the lake, so I'm very interested in what is going on.

I'm open for a discussion on any part of this proposal.

Thank you,

Norman Selsaas
P.O. Box 62
Ranier, MN 56668

Former:
Elect. Power Supt.
Boise Cascade
Int'l. Falls, MN
(June 1, 1961 - Oct. 1, 1982)

October 8, 1992

Dear Sirs:

We of the Ash River Trail Commercial Club wish to inform you that we are all in support of the proposed water level changes that are being considered by the water level committee.

We are all in agreement that the proposed changes for the Kabetogama - Namakan reservoir basins water level will benefit not only the business community for early season customers but also we, along with the other groups involved feel that it will greatly benefit the fish population, especially the northern pike species, we feel that the increased water level in early spring will greatly help all of the fish species in the spawning period which is so critical.

we also feel that the increased water level in early spring and consistant and slowly decreasing water level over the summer months will help the Minnesota Common Loon population, which has been in decline in our region.

We strongly urge implementation of the proposed changes, as soon as possible.

The following businesses agree with the proposed , water level changes.

Ash Ka Nam Resort

Ash Trail Lodge

Frontier Resort

Hidden Hills Campground

Minnesota Voyageur Houseboats

Sunset Resort & Campground

Voyageur Marine

October 13, 1992

The U.S. - Canada Water Level Steering Committee
c/o Mr. Joe Boyle
235 4th Avenue
International Falls, Minnesota 56649

Greetings:

This is to comment upon proposals being considered to alter the regulation of the level of Rainy Lake.

As property owners on Rainy Lake we have taken a keen interest in proposed rule curve changes. We realize that this is a complex issue and that agreement will be difficult to achieve among all the stakeholders.

But given this very complexity, and the tenuous benefits and substantial risks of proposed changes, it is our preference that lake level regulation pursuant to the existing rule curve remain unchanged. We have made a substantial investment in property, improvements, and life-style based upon the existing conditions. We recommend that Rainy Lake levels be maintained according to the present IJC Rule Curve.

Sincerely,

Allan W. Meadows
Rt. 8 Box 519A
International Falls, Minnesota
56649

Myrna Ahlgren
Rt. 8 Box 519A
International Falls, Minnesota
56649

Ontario

Incredible ONTARIO Irrésistible ONTARIO

Ministry of Tourism and Recreation
Ministère du Tourisme et des Loisirs

616 Mowat Avenue
Fort Frances, Ontario
P9A 1Z3

616 avenue Mowat
Fort Frances (Ontario)
P9A 1Z3

October 28, 1992

Ministry of Natural Resource
Mr. Bill Darby
Area Supervisor - Rainy lake
922 Scott Street
Fort Frances, Ontario
P9A 1J4

Dear Bill:

Thank you for the opportunity to comment on the Rainy and Namakan Water Level International Steering Committee Rule Curve proposals.

The Ministry of Tourism and Recreation supports the changes and offers the following suggestions:

I. Develop or oversee some form of communication system to forewarn tourist operators and other property owners of high water levels occurring in June. With advance notice, property owners are able to prepare for the high water and take measures to secure their docks.

II. Should any new changes be accepted, the potential minimum and maximum water levels should be communicated to the property owners to ensure full understanding of these changes. Unexpected changes are more likely to cause unnecessary heartache for both the regulatory body as well as for the property owners. While the International Steering Committee may not be the body responsible for such follow up, the committee is in the position to recommend positive approaches to community communication plans, evaluations and review systems and management.

III. A regular review of the rule curve effects on the users, residents, wildlife and environment should take place every 5 - 8 years to ensure the objectives continue to be met.

...2

I hope you find these comments useful. I appreciate the opportunity to provide input to the committee's proposal.

Regards

Lynn Cox
Tourism Industry Consultant
Fort Frances

cc: Doug Clarke

LC/dma
wp51\docs\DarbyLev.Let

BARTLETT & ASSOCIATES, INC.
CONSULTING ENGINEERS

October 28, 1992

Mike Romslo
Steering Committee Member
International Falls, Mn. 56649

RE: Rainy Lake Sportfishing Club Questionnaire regarding Proposed Rule Curve Revisions to Rainy Lake Rule Curves.

Dear Mike:

I strongly oppose the proposal because I believe Spring flood potential is greatly increased. The top of the Proposed Rule Curve occurs before runoff - rainfall interaction can be assessed by the dam operators. Since a very significant portion of average rainfall occurs in June, flood potential is increased by high early lake levels.

I also disagree with the statement (the proposed change) "is good for navigation throughout the boating season". The bottom of the Proposed Rule Curve will mean that many docks will be inaccessible in late summer and sailboats won't be able to enter many of the protected bays now enjoyed. All but one of the existing public docks will be too shallow to access.

In low water years, i.e., in years when the dam operator is having a hard time keeping the lake level up to the bottom curve, safety for boaters will be an issue. Many of the protected channels will be so shallow as to prevent passage so boat traffic will be out in open portions of the lake in the wind.

I say leave the Rule Curves alone. Don't change anything.

Regards,

John D. Bartlett

P.O. BOX 1240, 501 THIRD STREET, INTERNATIONAL FALLS, MINNESOTA 56649 218-285-7409 FAX: 218-285-7414

vember 8, 1992,

Mr. Bill Darby,
Ontario Ministry of Natural Resources,
922 Scott Street,
Fort Frances, Ontario. P9A 1J4

Dear Bill:

We have received a copy of your Questionaire regarding water curves of Rainy Lake and Namakan Lakes.

I am one property owner and permanent resident of a sub-division of sixteen lots located north of Sapawe on the Marmion Lake-Seine River system.

We know that any decisions affecting water levels on Rainy Lake, utilmately affect water levels for us. If you decide on a certain water level for Rainy Lake, and it cannot be met through Namakan, you do not hesitate to pull water from our system.

In your flyer you mention how detrimental to the Environment, fish, animals, water birds and other wildlife a drawdown of three feet or more is. You could have included hardships on people.

Each winter this water system is drawn down six to eight feet to help the water curve on Rainy Lake. This not only adversly affects the above, it also dries out our well.

We strongly suggest when you are considering water levels, you consider all sources It is beyond reason that Lac Des Milles Lac could be controlled by cottage owners and the Marmion and the Seine River be controlled by Boise Cascade. It is time to co-ordinate water levels throughout the system.

Yours truly,

Bob Olson

Bob Olson.
313121 Ontario Limited,
Bob's Acres,
P.O. Box 928,
Atikokan, Ontario. POT ICO

Nov 8, 1992

To: Paul Rademacki
Minn. DNR
1601 Minnesota Drive
Brainerd, Minn 56401

Dear Mr. Rademacki,

This is an answer to the questionnaire on Rainy Lake Water Levels.

I am interested in both Rainy and Namakan water levels.

I do not support the steering committee's proposal.

Reasons are my concern about increased spring flooding and ice damage. Benefit to fish production not proven. Also, present winter drawdown forms a warm air space beneath the ice and above the shoreline when ice hangs up on rocks, etc. This space is a great benefit to mink and otter.

Sincerely,

Joseph J. Rahm
HCR 8 Box 506
Int'l Falls, Minn 56649
Ph # 218 286 4046

Nov. 9, 1992

To Rainy Lake-Namakin Water Level Steering Committee
Fort Frances

From James A Watson
Box 5610
Snowmass Village, CO
81615

Gentlemen:

I support the committee's recommendation on condition that Bosie will keep the level within the curve. Bosie has done a lousy job of keeping the level within the curve. They fail to anticipate a rise in the level when there are heavy rains, they keep it at maximum and usually open the gates too late. This Summer and Fall they were over for a long period because they did not open the gates soon eneough. I personally sustained much damage to docks and property because of their irresponsible regulation of the level.

If they follow their usual sloppy control, the new level would result in major floods in the Spring.

I recommend strict supervision of Boise, especially if the new plan is adopted.

Sincerely,

James A Watson

Mr. James A. Watson
Box 5610
Snowmass Village
Colorado 81615

ov. 9, 1992

Dear Geoff, I received the questionare from the DNR re the proposed level of the Lake. I told them what I told you that I was in favor of it IF Boise could be controlld . If the new plan goes in, and Boise continues to do a sloppy job there could be major floods in the ~~East~~ SPRING.

Boise refuses to anticipate a rise in the lake when there are heavy rains, and then they open the gates too late. The Lake was in flood stage for several weeks this summer and Fall because of this. When I called them to complain I got a Smart answer--he said he wasn't God and couldn't predict rains. I told him if he would stick his head out the window he could easily predict a rise in the Lake and open the gates like he is supposed to do.

So if the new plan goes in I think there should be close supervision of Boise.

Best to Nancy--we already have two feet of snow.

SIncerely,

Interpreted as "unclear"
Dec 2/92
WJ address yes

DONN FULLER
PO BOX 61
RANIER, MN 56668

PAUL RADOMSKI
MINNESOTA DNR
1601 MINNESOTA DRIVE
BRAINERD, MN 56401

DEAR MR. RADOMSKI, 11-16-92

I RECIEVED A YELLOW FLYER THE OTHER DAY CONCERNING THE "PROPOSAL FOR THE RAINY AND NAMAKAN RESERVOIRS". I HAVE A LAKE CABIN ON RAINY AND MY DOCK IS WORTH WELL OVER $10.000.00 SO I AM VERY CONCERNED ABOUT LAKE LEVELS. NOT TO MENTION BETTER SPAWNING AND NESTING CONDITIONS FOR WILDLIFE.
I WOULD LIKE TO READ MORE ABOUT THIS PROPOSAL. PLEASE SEND ME ANY THING THAT WOULD HELP ME DECIDE ABOUT THIS PROPOSAL.
I AM VERY GLAD THAT YOU ARE SEEKING PUBLIC INPUT ON THIS. IN THE PAST PROPERTY OWNERS AND SPORTSMEN HAVE FELT HOSTAGE BY THE "IJC".

THANK YOU

DONN FULLER

Strathwin Ltd.

John Midgley Marilyn Midgley
Box 310, Atikokan, Ont. P0T 1C0
1 (807) 597-5805

November 18, 1992.

Mr. Bill Darby,
Ontario Ministry of Natural Resources,
922 Scott Street,
Fort Frances, Ontario. P9A 1J4

Re: Rainy Lake and Namakan Water Level International Steering Committee:

The Writer, many owners and Resort Operators on the Seine River Water System have serious concerns about the effects of the International Joint Commission Rainy Lake controls on the Seine system.

My permanent home location is: Township of Hutchinson,
Plan 48M358
Lot 14 Reserve Bay
Marmion Lake.
Co-oedinates Lat 48 - 48 - 44N
Long. 091 - 20 - 10 W/O

Presently our water supply comes from Lac Des Milles Lacs which falls under the International Joint Commission. They conserve all possible water during drought, spill all possible water during flood.

Our system supplies Rainy Lake which falls under the International Joint Commission. They draw all possible water during drought. Hold back all possible water during flood.

Our location trapped between these two extremes encounter vertical extremes in excess of ten feet with all the shortcomings outlined.

In your Steering Committee Proposal: We fear that Steering Committee Proposals for Namakan and Rainy Lake curves will promote greater use of the Seine system to maintain Rainy Lake curves to the detriment of everyone on the Seine system.

We appeal that everyone involved in these control levels, expand their concerns to the entire Seine system curves, and encourage strict co-ordination between Rainy Lake International Joint Commission and the Lac Des Mille Lac International Joint Commission controls, in order that the Seine system does not become the buffer between the two International Joint Commissions during both extremes of drought and flood.

Yours truly,

John Midgley.

c.c: Mr. Ian Angus, M.P., Mr. Howard Hampton, M.P.P., Mr. Devon Eldrige, Boise Cascade

Nov 18/92-
Box 1813
Atikokan Ont
P0T1C0

Dear Sir

As a owner on the Seine river system
Nasmion Lake watersshed
And as I live on Rainy Island
I am concerned about the
water Level and any drop
in the water below three
feet has an affect on
Wildlife and people

While decisions like this
is being considered
Our rights should be
Addressed Also

Yours Truly.

William Allan
Box 1813
Atikokan Ont
P0T1C0

Have a good day -

WAYNE & LESLIE ALMGREN
R.R.#5, Hwy. 17
Thunder Bay, Ontario
P7C 5M9
Telephone: (807) 475-5969

November 24, 1992

ONTARIO M.N.R.
922 Scott Street
FORT FRANCES, ON
P9A 1J4

ATTN: Mr. Bill Darby

Dear Mr. Darby:

RE: Proposal for Rainy & Namakan Reservoirs

It has come to our attention that there is in the works a proposal regarding the future water levels on Rainy Lake. Being that we are cottage owners on the Seine River-Marmion Lake watershed, we are quite concerned regarding the affect this proposal will have on fish, birds, wildlife and the people in our region.

Our watershed is currently drawn down six to eight feet annually, and we fear that the M.N.R.'s new proposal will draw down the water below the safety point, thus affecting the people and wildlife of our area.

Our environment is under enough stress already and we fear that if this proposal is passed it will be yet another blow to the environment. Please investigate an alternative solution in order to rectify the water level problem you are now facing in the reservoirs.

Yours truly,

Wayne & Leslie Almgren

Wayne & Leslie Almgren

vember 8, 1992,

Mr. Bill Darby,
Ontario Ministry of Natural Resources,
922 Scott Street,
Fort Frances, Ontario. P9A 1J4

Dear Bill:

We have received a copy of your Questionaire regarding water curves of Rainy Lake and Namakan Lakes.

I am one property owner and permanent resident of a sub-division of sixteen lots located north of Sapawe on the Marmion Lake-Seine River system.

We know that any decisions affecting water levels on Rainy Lake, utilmately affect water levels for us. If you decide on a certain water level for Rainy Lake, and it cannot be met through Namakan, you do not hesitate to pull water from our system.

In your flyer you mention how detrimental to the Environment, fish, animals, water birds and other wildlife a drawdown of three feet or more is. You could have included hardships on people.

Each winter this water system is drawn down six to eight feet to help the water curve on Rainy Lake. This not only adversly affects the above, it also dries out our well.

We strongly suggest when you are considering water levels, you consider all sources It is beyond reason that Lac Des Milles Lac could be controlled by cottage owners and the Marmion and the Seine River be controlled by Boise Cascade. It is time to co-ordinate water levels throughout the system.

Yours truly,

Bob Olson

Bob Olson.
313121 Ontario Limited,
Bob's Acres,
P.O. Box 928,
Atikokan, Ontario. POT ICO

RANDY POZNIAK, C.P.A.
CERTIFIED PUBLIC ACCOUNTANT

MEMBER OF
MINNESOTA SOCIETY OF
CERTIFIED PUBLIC ACCOUNTANTS

213 THIRD STREET
INTERNATIONAL FALLS, MN 56649
(218) 283-8148

December 9, 1992

Mr. Paul Radomski
Minnesota DNR
1601 Minnesota Drive
Brainerd, MN 56401

I am writing to express my opposition to the proposed change in the Rainy Lake rule curve. As I understand the proposal, the new curve will lower the water by about 6" - 12" during the summer months and draw the water down earlier in the fall.

As to higher water in the spring, Rainy is generally frozen until approximately May 1. The existing curve has the May 1 water level at 1106.5 verses 1107.5 for the proposed curve. This added water will cause considerable increased upward pressure on the ice which will cause damage to existing docks and water lines. The added water will not increase spring navigation as suggested at the public hearing due to the timing of ice out.

May and June are generally our heaviest periods for rain. If we have any extended periods of rain during this period, we could have extensive shoreline damage due to flooding. Mr. Joseph Boyle has been telling folks in Int'l. Falls that we won't have flooding if Boise Cascade pays closer attention to the lake levels and gates on the dam. The problem I see with that idea is the restriction at the mouth of Rainy River. The restriction at Ranier is the key to flood control as it severely restricts the amount of water leaving Rainy Lake.

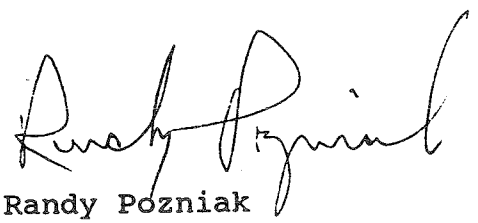
Lower summer water levels will result in reduced navigation. Rainy Lake has many reefs and rocks close to the surface. If the summer lake level is lowered 6" - 12" new uncharted hazards to navigation will appear.

As to the earlier draw down in the fall I have no objection. In fact that should be an improvement to the fishery as the fall winds will wash the spawning beds of accumulated silt and mud.

The presenters at the public hearing said the last time the curve was modified was in 1970. What change was made then? I will speculate the change resulted in lower spring water levels. I can remember in the 1960's the parking lot at Island View Lodge would flood every spring. We lately have not had the spring flooding as was common prior to 1970. The steering committee's proposal seems to be reverting back to the pre 1970 spring floods.

Thomas Worth's letter to the editor on November 13, 1992 states "This proposal does not increase the flood potential as some fear." This quote is the complete reverse of what was presented at the public hearing and also reflected in the September 10, 1992 correspondence to the steering committee members from Mike Romslo. The Romslo information indicates Rainy Lake has gone above 1108.6 feet .7% of the time from 1957 through 1986. The simulated operation of the proposed curve during the same period would go above 1108.6 1.4% of the time. Double the potential for floods! Your proposal has reduced flood potential in the fall and late summer but significantly increases the flood potential in the spring and early summer.

As at the public hearing, I will again ask; if this proposal is accepted by the IJC, knowing the potential for flooding will increase and ultimately cause shoreland damage, who is financially responsible? If a new dam is built that floods property, those property owners are compensated. If the operation of an existing dam is changed to knowingly cause flooding who compensates property owners?



Randy Pozniak

Kabetogama
Lake Association, Inc.

RAY, MINNESOTA 56669

December 10, 1992

Paul Radomski
Dept. of Natural Resources
Rt. 8 Box 8
Int'l Falls, MN 56649

Dear Mr. Radomski,

The Kabetogama Lake Association does support the proposed change on the Water Level.

Sincerely,

Kabetogama Lake Association Inc.
KLA/MM

THE BOYLE
LAW FIRM
ATTORNEYS AND COUNSELORS AT LAW
235 FOURTH AVENUE
INTERNATIONAL FALLS, MN 56649
(218) 283-9481
FACSIMILE (218) 283-8170

ATTORNEYS
JOSEPH M. BOYLE
THOMAS J. WALSH

February 23, 1993

Mr. Don Buckout
Minnesota DNR
DNR Building
500 Lafayette Road
St. Paul, MN 55155

RE: Rainy Lake Namakan Water Levels

Dear Don:

Enclosed please find a proposal which I received today from Gary Thompson.

If you have any questions, please feel free to contact me.

Very truly yours,

Joseph M. Boyle

JMB:tw

Enclosure

PRINSCO INC

Modified Proposed Rule Curve

Benefits

Delayed Spring Increase for flood control and reduce damage to docks & intake structures

Good for navigation throughout main Boating Season

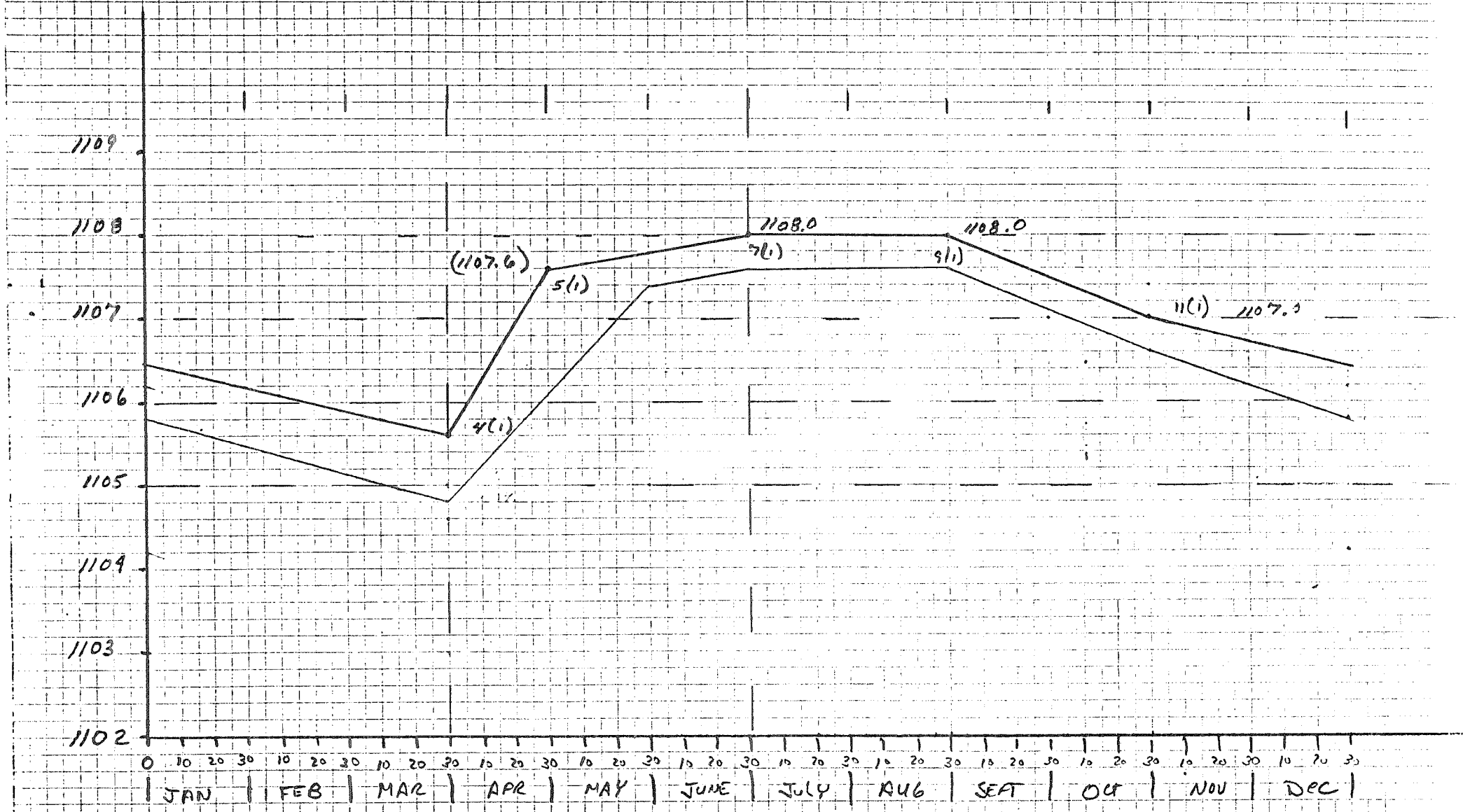
Provides better flood protection throughout year.

Provides faster water rise for wild life and better draw down in fall for shore cleansing.

Short comings: Although better than Proposed Rule Curve - Hydro electric is reduced.

MODIFIED PROPOSED RULE CURVE 12/4/92

RAINY LAKE



523 Colonization Rd. E.
Fort Frances, Ontario
P9A 2S1

March 8, 1993

Mr. Bill Darby
Ministry of Natural Resources
922 Scott Street
Fort Frances, Ontario
P9A 1J4

Dear Bill;

We are writing in response to the Proposal for the Rainy and Namakan Reservoirs with respect to water levels developed by the steering committee last fall. The Rendezvous Yacht Club has reviewed the proposal, and cannot support it, as is, because of the impacts of the proposed changes on our activities. Our objections are based on the following:

1. Dock Access: The portions of the proposed rule curves below 1107.0 feet will make it difficult, or impossible for some sail boats with deep draughts (3.5-6 feet) to reach their docks. Boat owners will have to make alternative arrangements for docking or haul their boats out earlier. As we described at our presentation last year, the lack of suitable docking (particularly in Canada) is the major impediment to sailing on Rainy Lake.

2. Boat Haulout: The only facility that is capable of launching or hauling out larger sail boats is Rainy Lake Houseboats. We appreciated the kind words of Mr. Dougherty at last fall's public meeting on our probable situation should these proposals be implemented. It hardly makes sense to launch (or indeed own) a boat when it may have to be hauled out before the end of July. If the US Park Service would pay for dredging the channel at Rainy Lake Houseboats, or would install an alternative launching facility, we would certainly reconsider our position.

3. Length of Season: The two previous items will reduce the length of our season. Goodness knows, winter is long enough. With the difficulties created by this proposal, it will become so difficult to keep at our sport that we will probably pursue other recreational activities (LIKE FISHING).

4. Navigation: Besides access to docks, it will be more difficult to access certain remote anchorages during times of low water levels. In addition, having lower lake levels during the winter may result in the lake staying below the proposed rule band in the spring and early summer. The document mailed to the public did not acknowledge that there will be negative impacts on navigation in the late summer - only the improved navigation in the spring.

5. Spring Dock Damage: Some of our members are concerned with the potential damage to their docks from ice in the spring. There is also a greatly increased potential for flood damage because the number of flood events will increase as a result of the proposed changes.

We understand that changes are needed to improve the fish habitat and navigation on Namakan Lake and that some adjustments to the Rainy Lake rule band may be necessary as a result. However, we are not prepared to accept the portions of the proposal which will result in summer time levels below 1107.0 feet. If improved launching and docking facilities for sail boats were made available on Rainy Lake, our opinion could be changed.

Thank you for the opportunity to provide our input.

Yours truly,

Jack Bartlett

Colin Hewitt

RYC Water Levels Committee

cc. Charlotte Soboleski
Commodore,
Rainy Lake Yacht Club
7708 Emmerson Ave. N.
Brooklyn Park, MN
55444

FEBRUARY 27, 1993

RAINY/NAMAKAN WATER LEVEL MANAGEMENT
INTERNATIONAL STEERING COMMITTEE

SIR:

YOUR PROPSAL TO MODIFY THE RULE CURVE FOR RAINY LAKE WILL

* INCREASE THE POTENTIAL FOR FLOODING
  THERE ARE NO FLOOD DAYS IN MAY UNDER THE EXISTING RULE CURVE. ADOPTING YOUR PROPOSAL THERE WOULD BE EIGHT (8) POTENTIAL FLOOD DAYS OCCURRING IN MAY!

  IN JUNE THERE IS A WHOPPING 285% INCREASE IN FLOOD RISK.

* CAUSE EXCESSIVE SHORELINE EROSION

* CAUSE COSTLY ICE DAMAGE TO DOCKS.

THERE IS NO CONCLUSIVE EVIDENCE TO SUPPORT YOUR POSITION THAT ADJUSTING THE EXISTING RULE CURVE WILL SIGNIFICANTLY AID IN INCREASING THE WALLEYE POPULATION. I BELIEVE THERE ARE OTHER INFLUENCES WHICH HAVE A FAR GREATER IMPACT ON THE DECLINING WALLEYE POPULATION, AND THESE SHOULD BE STUDIED FIRST.

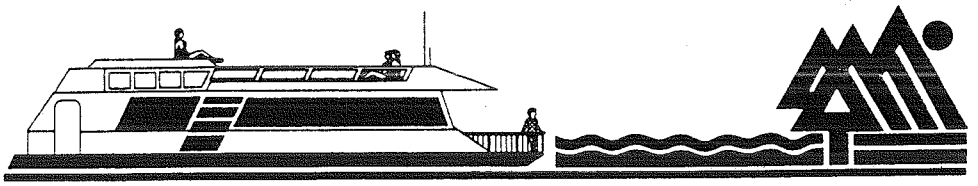
I SEE NO REASON FOR ANY ADJUSTMENT TO THE EXISTING RULE CURVE. THE DISADVANTAGES FAR OUTWEIGH ANY UNSUBSTANTIATED BENEFITS.

SINCERELY,

Andrew Wright

ANDREW WRIGHT

Home 286-3460
WK 285-5622



VOYAGAIRE HOUSEBOATS

7576 GOLD COAST ROAD • CRANE LAKE, MINNESOTA 55725 • 218-993-2333 • 800-88-BOATS

April 19, 1993

To: Rainy & Namakan Water Level Committee

From: Voyagaire Lodge & Houseboats

To whom it may concern;

We are in agreement with the new water level proposal, it will greatly improve the Spring business. Spring is the time of year when everyone is concerned about the level of the water. It shows in the revenue figures from May and the first half June. The May and June income combined is 15% less then July's alone.

Putting this plan into action would get rid of the most commonly asked question we hear from guests planning their May vacation, "How is the water level this year." People have heard such negative publicity about not being able to travel and dock boats due to the low water level. At times guests have been able to walk from the stationary dock to the roof of the houseboat.

The resorts in the area could concentrate on promoting the good aspects of the area instead of spending time and money on stopping rumors on the water level. Overall this is a great idea and will do nothing but help the area.

Sincerely,

Bill Congdon

LAC LA CROIX FIRST NATION
NEGUAQUON LAKE 25D

P.O. BOX 640
FORT FRANCES, ONT.
P9A 3M9

PH. (807) 485-2431
or (807) 485-2432
FAX (807) 485-2583

April 29, 1993

Mr. Bill Darby
Ontario MNR
922 Scott Street
FORT FRANCES, Ontario
P9A 1J4

Dear Mr. Darby

I have recently spoken with the Chief and Council of the Lac La Croix First Nation regarding the issue around the water levels of Rainy Lake and Namakan Lake.

Due to our interest in the water levels for the lively hood of the residents of Lac La Croix, the Chief, Council and the community are in support of raising the water level on Namakan Lake.

If their is anything further that the Lac La Croix First Nation can do to support your steering committees purpose, please let us us know.

Yours truly

Michael Cameron
Band Manager
Lac La Croix First Nation

Interpreted as in favour of proposal May 1/93

Citizens' Council on Voyageurs National Park

509 THIRD STREET
INTERNATIONAL FALLS, MINNESOTA 56649-2317
(218) 283-3507

MILTON L. KNOLL, JR.
Chairman
(612) 731-2441

JANE BESCH
Administrative Secretary

VICE CHAIR:
PHILIP PAULBECK
(218) 283-4475

LEGISLATIVE MEMBERS:
REP. IRV ANDERSON
(612) 296-4936

SEN. CARL KROENING
(612) 296-4302

SEN. PATRICK D. McGOWAN
(612) 296-2159

REP. WALTER E. PERLT
(612) 296-7807

CITIZEN MEMBERS:
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(218) 285-7816

KAREN BRIESE
(218) 286-5508

DAVID. K. DILL
(218) 993-2252

SELDEN R. HANSON
(218) 729-7558

CHARLES HELLELOID
(218) 286-5249

EDITH HOLS
(218) 728-4741

LAURENCE E. HUNTER
(612) 437-4597

THOMAS W. NEWCOME
(612) 227-9505

MATTHEW O. VALAN
(218) 789-7641

TIM WATSON
(218) 875-2811

May 10, 1993

Paul Radomski
DNR
1601 Minn. Drive
Brainerd, MN 56401

Bill Darby
OMNR
922 Scott Street
Fort Frances, Ont. T9A 1J4

Dear Paul & Bill:

At the May 1, 1993, meeting of the Citizens' Council on Voyageurs National Park, after lengthy discussion and testimony, the Citizens' Council passed unanimously the following resolution:

> The Citizens' Council on Voyageurs National Park goes on record in support of the Rainy/ Namakan Water Level International Steering Committee's proposed rule curve, subject to review of the final draft proposal.
>
> Moved by Mr. Tim Watson. Second by Mr. Larry Hunter. Passed unanimously.

We are enclosing with this resolution, some pictures and slides which were provided in support of the official record. You may wish to keep these on file, or include them with your recommendation to the International Joint Commission.

We have tentatively scheduled our next meeting for June 29, to be held at the Holiday Inn in Int'l Falls. It would be nice if you could attend and present the final proposal if it is ready.

Sincerely,

Milton Knoll

Milton L. Knoll, Jr.
Chairman

mlk:jdb

Encrs.

Citizens' Council on Voyageurs National Park

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(218) 789-7641

TIM WATSON
(218) 875-2811

MOTION: Support of the Steering Committee Rule Curve Proposal

DATE: May 1, 1993

LOCATION: Orr City Hall, Orr, MN

The Citizens' Council on Voyageurs National Park does hereby go on record in support of the Rainy/Namakan Water Level International Steering Committee's proposed rule curve, subject to review of the final draft proposal.

Moved by Mr. Tim Watson.

Second by Mr. Larry Hunter.

Passed unanimously this first day of May, 1993, by the Citizens' Council on Voyageurs National Park.

12 Jun 1993

Mr. Paul Radomski
Dept. of Natl Resources
Rt. 8 Box 8
International Falls, Mn 56649

Dear Sir:

I am a summer resident on Bear Island Crane Lake. I have been studying your proposed changes in the water levels. If these proposed changes are enacted it will render my property useless.

If this is to be I will expect to be compensated for the loss of my property. I will expect to receive full market value for my property.

Respectfully yours,

Max J. Carney
419 S. Shore Bear Is.
Crane Lake, Mn 55725

218-993-2254

– I called Mr. Carney on June 24, 1993, and asked him what his concern was. He was concerned about low water in the summer. After I explained the proposal in detail and related current water levels with the proposal, Mr. Carney indicated that the proposal may not negatively affect his lakeshore property. He requested a detailed graph of the proposal, which I then sent to him.

Paul Radomski

June 8, 1993

Rainy Lake/Namakan Reservoir Water Level
International Steering Committee

Dear Co-Chairs:

Our on-going efforts to restore the quality walleye fishery in Rainy Lake are significantly hindered by the adverse effects of the existing rule curve. High harvest affects how long walleye live in Rainy Lake, but water levels affect how many young fish enter the fishery. The existing Rainy Lake rule curve alters aquatic plant communities and spawning shoals so that it negatively affects fish spawning success. The altered aquatic plant communities, created by unnatural seasonal water level changes of the existing rule curve, reduces habitat and abundances of invertebrates young walleye need. Most importantly, the existing rule curve reduces good walleye spawning habitat by limited clean submerged rock rubble available during spawning time.

We strongly support the Steering Committee's proposal which recommends modest changes to the existing rule curve. The Steering Committee's recommendations offer changes in water level management that have the potential to improve the fishery and aquatic ecosystem, and we believe this proposal best balances all interests on the lake. We also believe that the water level management plan developed by the Steering Committee would best address Article 402 of the U.S. Federal Energy Regulatory Commission (FERC) license to the International Falls Hydroelectric Power Project, which requires the protection and enhancement of fish and recreational resources.

We highly recommend that the Steering Committee submit this proposal to the International Joint Commission (IJC), and that the IJC implement the recommended rule curve modifications.

Sincerely,

Rainy Lake International Fisheries Task Group (Appended)

cc: Rodney W. Sando, Commissioner, MN Department of Natural Resources
Howard Hampton, Minister, Ontario Ministry of Natural Resources
George Taylor, Division of Compliance, FERC

Ontario Memebers		Minnesota Memebers	
Frank Wepruk		Mike Williams	
Geoff Gillon	X	Jim Bischoff	
Dale LaBelle		Stuart Milete	
Henry Miller		Gus Christianson	
Rick Socholotuk		Dick Schaak	
Blaine Tucker		Jim Hebner	
Vic Alberts		Charles Helleloid	
Tom Reid		Tim Shuff	
Glenn Witherspoon		Robert Trompeter	
Chas Perrault		Bill Dougherty, Jr.	
Merle McFayden		Al Arnold	
Don Tucker		Tim McBride	

c:\chief\cochairs.ltr

CRANE LAKE
Commercial Club, Inc.

CRANE LAKE, MINNESOTA 55725

Fishing

60 Miles of Waterways

Canoeing

Boating

Swimming

Water Skiing

American and Housekeeping Resorts

Motels

Trailer Camps

Houseboats

Public & Private Campgrounds

Seaplane Base

Marine Service

Groceries

Gas

Tackle & Bait

Souvenirs

Customs Service

June 25, 1993

International Steering Committee
c/o David Dill, Member
Crane Lake, MN 55725

At the last meeting of the Crane Lake Commercial Club, on June 22, we had much discussion about the proposed water levels changes. Afterwards we voted to support your proposal. Two members abstained from voting.

It was noted that because of the narrow water level band, the conditions would have to be monitored very closely.

Yours truly,

Glennda Scott

Glennda Scott
Administrative Secretary

DR. A.O.H. SETZEPFANDT-CAROL W. SETZEPFANDT
BIRD ISLAND, MINNESOTA 55310
612-365-3333

TO: Paul Radomsky
Minn D.N.R.
1601 Minn Drive
Brainerd, Minn
56401

DATE June 2nd - '93
SUBJECT Response to
Changing the Rule Curve.

To Continue Briefly

Paul: We'll be lucky if the lake is up to normal by June 10th this year & that's tough to take. The Committee's proposal appears to have an earlier than normal draw down starting in late June or early July. This would also play "havoc" with those of us who have shallow shore lines - as well as the Rock in Crane Lake - so we'll be able to say "so long" to dock access in the summer for many of us.

I would suggest that should you go ahead - and I am proven to be correct in my statements - that those responsible for destroying our access to property - that they will be ready & prepared to purchase our property at its present fair market value. - It will at that time be useless for us to use. - Sincerely - A.O.H. Setzepfandt Ex State Senator

Item #ML73T © Wheeler Group Inc., 1979 REORDER ITEM #ML73T

FOLD AT (-) TO FIT DRAWING BOARD ENVELOPE #EW9DW

3. Comments: Hydrological information available to me suggests that there is serious doubt that an early increase in Crane Lake-Namakan Reservoir can be made - we haven't even obtained a normal level this year at this late date. - I'm still lifting my motor & poling thru the Rocks to a dock that has lake water just at its outer edge at this time. Gradually we have water levels near to normal by noon - you want to make it worse???

Optional: Ex State Senator

Name: Dr. A.O.H. Setzepfandt
P.O. Box 356
Bird Island, MN
55310

Address: H.C.R.-3-Box 113 B-
Crane Lake, MN. - 55725

Phone Number: 612-365-3333 or 993-2962

Please give to a steering committee member
or mail to:

Paul Radomski
Minnesota DNR
1601 Minnesota Drive

Bill Darby
Ontario MNR
922 Scott Street

Minnesota Chapter
of the
American Fisheries Society

August 1, 1993

Mr. Paul J. Radomski
Fisheries Biologist and Co-Chair of the
Rainy/Namakan Water Level
International Steering Committee
Minnesota Department of Natural Resources
1601 Minnesota Drive
Brainerd, MN 56401

Dear Mr. Radomski:

The Minnesota Chapter of the American Fisheries Society (AFS) has reviewed the Rainy/Namakan Water Level International Steering Committee's proposed rule curve and the associated supporting literature and documents. We feel that the literature and research supports the need for changes in the current lake level management system based on aquatic resource and environmental concerns; and, therefore, offer our support for the water level management changes recommended by the Steering Committee.

As you know, the AFS is an international scientific organization dedicated to strenghthening the fisheries profession, advancing fisheries science, and conserving and developing fisheries and aquatic resources throughout the world. The Minnesota Chapter is a chartered subunit of the AFS with the primary mission to promote the conservation, development, and wise use of the fisheries and aquatic resources in the State of Minnesota. The MN Chapter currently has 221 members, who are primarily fisheries and aquatic biologists, managers, fish culturists, researchers, administrators, educators, and students with interest in the aquatic resources. The MN Chapter acts as an advocate for the state's aquatic resources by providing scientifically-based information and expert opinion on resource issues.

Based on our Chapter members' review of the Steering Committee's proposed rule curve changes and the scientific literature and research, the MN Chapter supports the Steering Committee's recommendations, as summarized in the Committee's June 1993 **Final Report and Recommendations**, for moderate changes in the existing water level management system on the Rainy/Namakan Lakes. The Chapter feels that the proposed rule curve changes will be beneficial to the native flora and fauna of the Rainy/Namakan ecosystem. The proposed changes will result in more "natural" fluctuations in water levels and will improve the suitability of the lakes for the native species of fish and wildlife.

The Chapter is impressed by the amount of work and coordination obviously required in reaching a plan that addresses numerous diverse and complex concerns. The proposed changes incorporate multiple issues (fish, wildlife and aquatic vegetation, hydropower, navigation, and flood control) in a fashion which, with the exception of hydropower, seem to be an improvement over the current operation.

Although potential loss of revenue to Boise-Cascade from hydropower generation may occur under the Steering Committee's proposed rule curve, we feel that losses to a private firm should not weigh heavily in considerations of public water management and aquatic resource protection. Furthermore, we suggest that actual revenue loss projections, if an issue, should be calculated by independent accountants.

Development of an operational plan which totally satisfies all parties and concerns is probably not feasible, especially for an international issue such as this. Despite these constraints, the plan appears to be a solid effort to improve the lake level regimes for the Rainy Lake/Namakan Reservoir system. The MN Chapter commends the International Steering Committee for its conscientious, two-year process of analysis of this complex issue and supports the Committee's recommendations to the International Joint Commission later this year.

Sincerely,

Virginia M. Snarski

Virginia M. Snarski
Issues Committee Chair and Immediate Past-President
3325 Medin Road
Duluth, MN 55804

cc: Donald Pereira
Luther Aadlund
John Brazner
Greg Busacker
Dirk Peterson

A2415

The International Joint Commission
United States Section
2001 "S" Street N.W., Second Floor
Washington, D.C. 20440

AUG 12 1993

Dear Chairperson:

The National Park Service concurs with the Final Report and Recommendations of the International Steering Committee on Rainy Lake/Namakan Reservoir Water Level. The analysis and proposals submitted by the committee are based on years of research on the aquatic ecosystem and wildlife within Voyageurs National Park. They also represent a balanced approach between preservation of the resources, visitor use of the area, and other local interests. The National Park Service supports the efforts of the steering committee and requests that you approve the proposed change to the management of water levels on Rainy Lake and Namakan Reservoir.

In establishing Voyageurs National Park, Congress recognized the significance of the area in stating, "... the purpose of this Act is to preserve, for the inspiration and enjoyment of present and future generations, the outstanding scenery, geological conditions, and waterway system which constituted a part of the historic route of the Voyageurs who contributed significantly to the opening of the Northwestern United States." Approximately 40% of the park is water, primarily Rainy Lake and the Namakan Reservoir (Kabetogama, Namakan and Sand Point Lakes). The balance of the park contains a considerable amount of aquatic ecosystem with beaver ponds, bogs, and marshes. The concept of the park is that of a roadless area, leaving the automobile behind and venturing into the wilderness by boat.

The natural ecosystem has been altered over time primarily with the construction of the dams at International Falls, Kettle Falls, and Squirrel Falls. The operation of these dams has primarily been for the purpose of hydropower generation. In addition, the operating procedures (rule curves) have evolved around historic flood events. As with many actions resulting in human intervention, the effects on the environment have not received due consideration. The recommendations of the steering

committee will help to alleviate the existing environmental problems due to the water level management system on Rainy Lake and Namakan Reservoir.

Sincerely,

Roger Kennedy
Director

bcc:

Ben Clary, Superintendent, Voyageurs NP
Regional Director, Midwest Region
001, 470
479-Marshall Flug

STATE OF
MINNESOTA
DEPARTMENT OF NATURAL RESOURCES

500 LAFAYETTE ROAD, ST. PAUL, MINNESOTA 55155-4037

OFFICE OF THE
COMMISSIONER

DNR INFORMATION
(612) 296-6157

August 16, 1993

Paul Radomski, Bill Darby
Co-Chairs
Rainy/Namakan Water Level
International Steering Committee
c/o Minnesota Department of Natural Resources
1601 Minnesota Drive
Brainerd, Minnesota 56401

Re: Rainy Lake & Namakan Reservoir Water Level Final Report and Recommendations
(Public Review Draft)

Dear Mr. Radomski and Mr. Darby:

The Minnesota Department of Natural Resources has reviewed the Rainy/Namakan Lake Level Report, and we fully support the recommendations of the Steering Committee for proposed changes to the existing rule curves, based on the reasons given in the report justifying the need for modification. However, the Department has some recommendations for improving the report to deal with a couple of areas of concern.

The potential for increased spring flooding recognized in the report calls for additional hydrologic modelling and analysis of the potential effects of the Steering Committee's proposal on flood-prone properties. In addition, better hydrologic monitoring and modelling of the watershed would improve the forecasting of flood peaks, enabling better control of the peaks through dam operations.

Because of its authority and expertise in dealing with large-scale water systems, we feel that it is appropriate for the International Joint Commission (IJC) and/or the U.S. Army Corps of Engineers to conduct the hydrologic analysis of the proposal. Therefore, we recommend that the Steering Committee's recommendation for a change in the rule curves be accompanied by a request for hydrologic analysis by the IJC or Corps of the effects of the proposal on flood-prone properties.

To address the need for better watershed monitoring and modelling, we recommend that the recommendation in Section V.B. of the report (page 44), dealing with watershed monitoring and inflow predictions, be clarified to specifically address the need for better hydrologic monitoring and modelling to facilitate anticipation of high and low flows into Rainy and Namakan Lakes, and thereby improve water management.

With the incorporation of these recommendations, the MDNR supports the transmittal of the Steering Committee's Report and Recommendations to the International Joint Commission for consideration at its Fall 1993 meeting.

Yours truly,

Rodney W. Sando
Commissioner

c: Roger Holmes
Kent Lokkesmoe
Don Buckhout

DR. A.O.H. SETZEPFANDT-CAROL W. SETZEPFANDT
BIRD ISLAND, MINNESOTA 55310
612 - 365-3333

DATE July 15, 1993

TO: Paul Radomski - Mn DNR
1601 Minnesota Drive
Brainerd, Minn.
56401

SUBJECT Your July 13 mailing to my Crane Lake Cabin...

D.A.O.H. Setzepfandt

Paul:

I have recieved the DNR report by David Ford containing the DNR "Normal Review, as well as the DNR authored "Appendix".. And I especially noted the appendix summary (bottom of page three) where more stastical and specific information is requested..

Might I add that a knowledgable friend of mine who is much better versed than I on how your proposal affects Crane Lake - and who also tracks and logs the Crane Lake levels - has informed me that the June 20th date that you have checked on your rule curve map-- The Crane lake guage showed 1117.80, not the 1117.50 that you show for the Kettle Falls reading.. this indicates a nearly 4 inch difference in lake levels on the same date..

I should further note that from July 4 to July 13 Crane Lake levels were 1118.85 to 1118.90.. Those levels are at least 2/10 of a foot above the allowable rule curve max.. On July 14 the reading here on Crane Lake was 1118.75. So-- Crane lake has been out of the rule Curve since the 4th of July. If the high water (out of the curve) can not be regulated in Crane lake thru 10 plus days in early to mid-Julyhow can you expect to control the low water in mid-summer.

Now, we don't mind alittle "high" water in July, some here even appreciate it -- however we do mind a "little" or a "lot" of Low can DESTROY many of us - that is our primary concern. Sincerely

Dr. A.O.H. Setzepfandt - ADHS
A very concerned Minnesotan-

National Audubon Society

Minnesota Audubon Council
26 East Exchange Street, Suite 207
St. Paul, MN 55101
(612) 225-1830
FAX: (612) 225-4686

August 23, 1993

Paul Radomski
Minnesota Department of Natural Resources
1601 Minnesota Drive
Brainerd, MN 56401

Dear Mr. Radomski,

The recommendations of the International Joint Commission Steering Committee regarding water level regulation for Rainey and Namakan lakes was recently brought to the attention of the Minnesota Audubon Council of the National Audubon Society by some of our members who live in northern Minnesota. We have discussed the issue with our issue committee and on behalf of the 13,000 Minnesota members of the National Audubon Society, wish to offer our support for the recommendations as proposed.

We appreciate the effort by the Steering Committee to address the needs of the fish and wildlife that inhabit these ecosystems in the proposed rule curve. We understand that great effort has been taken to consider all interests and perspectives in developing this proposal. We are dismayed to learn through recent media reports that Boise Cascade Corporation, though they were part of the Committee that developed the proposal, now intends to oppose it's adoption by the International Joint Commission.

We urge the International Joint Commission to adopt the proposed new rule curve despite Boise's opposition. It is important that public resources, such as water, be managed in a balanced manner that benefits all resources and interests. Private control of public resources are legacies of past policies that often damage other resources and their users, and are incompatible with modern resource management. The slight reduction (7%) in hydroelectric power production, seems a small price to pay for better water resource management.

Sincerely,

Don Arnosti
Minnesota Director

cc: Bill Darby

Citizens' Council on Voyageurs National Park

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INTERNATIONAL FALLS, MINNESOTA 56649-2317
(218) 283-3507

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REP. WALTER E. PERLT
(612) 296-7807

CITIZEN MEMBERS:
ALLAN C. ANDERSON
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CHARLES HELLELOID
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THOMAS W. NEWCOME
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MATTHEW O. VALAN
(218) 789-7641

TIM WATSON
(218) 875-2811

September 10, 1993

Mr. Paul Radomski, Co-Chair
Water Level Steering Committee
Minnesota DNR
1601 Minnesota Drive
Brainerd, MN 56401

Dear Paul:

For your committee's records, I'm enclosing material pertaining to the Citizens' Council's support of the recommendations of the Rainy/Namakan Water Level Steering Committee. This information includes a copy of the resolution passed by the Citizens' Council on August 28,1993, a letter to Director Roger Kennedy, and a memo to the Minnesota Congressional Delegation.

The Citizens' Council would like to know when this matter comes before the International Joint Commission. You can advise Mary Schuman at our International Falls office.

If you need additional information, please advise.

Sincerely,

Milton Knoll mks

Milton L. Knoll. Jr.
Chairman

mlk:mks

Encr.

cc: CCVNP Members

RESOLUTION

WHEREAS, the Citizens' Council on Voyageurs National Park was one of the groups organizing the Rainy/Namakan International Water Level Steering Committee; and

WHEREAS, the Citizens' Council on Voyageurs National Park has been represented on the Rainy/Namakan International Water Levels Steering Committee; and

WHEREAS, the Citizens' Council on Voyageurs National Park has had numerous reports from the staff of the Steering Committee during the research and study of water levels; and

WHEREAS, the Citizens'Council on Voyageurs National Park has studied and reviewed the current draft of the Steering Committee; and

WHEREAS, the Citizens' Council on Voyageurs National Park has provided the public opportunities and Boise Cascade and Border Lakes Association to present their views; and

WHEREAS, the Citizens' Council on Voyageurs National Park has reviewed the reports by Acres International Limited on flood damage potential; the effects of water level fluctuations by the Cadmus Group, Inc.; the review and analysis of studies on the effects of water level fluctuations by Environmental Management Associates; and

WHEREAS, the Citizens'Council on Voyageurs National Park has again discussed in detail the various points of view mentioned above at the CCVNP meeting of August 28, 1993;

NOW THEREFORE BE IT RESOLVED, that the Citizens' Council on Voyageurs National Park go on record supporting the Current Draft Recommendations of the Rainy/ Namakan International Water Level Steering Committee urging International Joint Commission to adopt these recommendations; and

BE IT FURTHER RESOLVED, that the Citizens' Council on Voyageurs National Park recommend the Director of National Parks and Secretary of Interior lend support to VNP's position urging I.J.C. to adopt the Steering Committee's recommendation; and

BE IT FURTHER RESOLVED, that the Citizens' Council on Voyageurs National Park request the Governor of Minnesota, the Commissioner of DNR, and all members of the Minnesota Congressional Delegation support the Steering Committee in urging the I.J.C. to adopt these recommendations.

Roll Call Vote

10 to 0

Passed 8-28-93

VOYAGEURS REGION National Park Ass'n

Suite 302C
119 N. 4th St.
Minneapolis, MN 55401
612/333-5424

September 23, 1993

Paul Radomski
Minnesota DNR
1601 Minnesota Drive
Brainerd, MN 56401

Dear Mr. Radomski;

I am writing on behalf of the Voyageurs Region National Park Association's (VRNPA) Board of Directors, in support of the Rainy Lake/Namakan Reservoir Water Level International Steering Committee Final Report and Recommendations.

We urge approval of the proposed rule curve change and hope that you will express our support when the International Joint Commission considers the issue.

VRNPA is a private non-profit organization that works to preserve, encourage and promote the natural, recreational and historic resources of Voyageurs National Park (VNP) in accordance with the Park's enabling legislation and in addition to be a friend to other National Park Service managed lands in the region.

We believe this proposal, intended to move toward a more natural seasonal fluctuation of water levels in the reservoirs in Voyageurs National Park is one that should be passed as soon as possible. Voyageurs is a national park with characteristics unique to the National Park System. Our preference would be to eliminate "management" of the water levels and allow normal fluctuations to occur but the proposal that you and the Steering Committee have developed takes significant steps in that direction and we strongly support your work and the recommendation of the Committee.

VNP, a water-based park, is a particularly sensitive problem. The park was established to preserve the special natural environment of the area. Thirty-nine percent of the park is water and reservoirs. Most of the water --96%-- is in two reservoirs, the Namakan Reservoir and Rainy Lake.

The current rule curve is a significant factor in a long list of VNP problems and issues: a low loon and grebe reproduction rate, poor spawning for walleyed and northern pike and extreme winter draw down that "strands hibernating amphibians and furbearers and exposes incubating fish eggs to winter freezing", losses to resort owners of as much as $800,000 in annual income because the Kabetogama-Namakan level is not brought up to natural levels until mid-June, well into the short resort season in the area. The Loon River that serves the native community on Lac La Croix is not navigable until well into June. Studies by the National Park Service and others suggest that changes in the fish communities of Rainy and Namakan Lakes are in direct proportion to the departures of the controlled water levels from natural fluctuations.

If the new curve were to be approved, it would have positive effects on the natural balance of wildlife and vegetation in the Park as well as to help the economic viability of a depressed part of our region. We would be happy to help this proposal to be approved. Please let us know if there is anything we can do.

We also urge you, as a representative of the State of Minnesota, to do what you can to have this proposal passed by the International Joint Commission, as soon as possible.

Thank you for the opportunity to comment on this proposal.

Sincerely,

Allan Davisson

Allan Davisson, Former Chair
Voyageurs Region National Park Association

cc. Bill Darby
Ben Clary

The Izaak Walton League of America

September 23, 1993

Mr. Paul Radomski
Minnesota DNR
1601 Minnesota Drive
Brainerd, MN 56401

Dear Mr. Radomski:

Re: Rainey/Namakan Lakes "Rule Curves"

I am writing on behalf of the members of the Minnesota Division of the Izaak Walton League to lend the Izaak Walton League's support to the Final Report and Recommendations [June 1993] found in the Executive Summary that are in process to IJC.

The League agrees with the Steering Committee proposals resulting from discussion and in part the abstract of works done by Cohen and Radomski on the impact of current "Water Level Regulations and Fisheries" in Rainey Lake and the Namakan Reservoir.

We urge the revisions proposed to IJC by the Steering Committee.

On behalf of the Minnesota Division IWLA,

David F. Zentner, President

APPENDIX B

FEDERAL ENERGY REGULATORY COMMISSION (FERC) LICENSE REQUIREMENTS

ARTICLES 401 - 404

LICENSE FOR PROJECT 5223, FEDERAL ENERGY REGULATORY COMMISSION, DECEMBER 31, 1987

Article 401. The licensee shall operate the International Falls Hydroelectric Project according to the rule curve regulating the level of Rainy Lake as prescribed by the International Joint Commission.

Article 402. The licensee shall, after consultation with the U. S. Fish and Wildlife Service (FWS), the National Park Service (NPS), and the Minnesota Department of Natural Resources (MDNR), develop a water-level management plan for Rainy Lake to ensure the protection and enhancement of water quality, fish and wildlife, and recreational resources in Rainy Lake. The recommendations contained in the plan shall be based on the results of the studies being conducted by the Voyageurs National Park and other studies conducted by the licensee after consultation with the FWS, the NPS, and the MDNR. Within 6 months from the date of issuance of this license, the licensee shall file for Commission approval a schedule of any studies to be conducted by the licensee and a schedule for the completion of a final report which contains specific recommendations concerning water levels in Rainy Lake. Comments from the consulted agencies concerning the licensee's proposed studies and the schedule for completion of the studies and the final report shall be included in the filing. The Commission reserves the right to modify the proposed studies or the proposed schedule.

The final report containing the water-level management plan shall be submitted to the Commission according to the approved schedule. Should the recommendations contained in the plan require approval by the International Joint Commission (IJC), the recommendations shall be proposed to the IJC prior to filing with the Commission. The licensee shall include comments from the IJC and the consulted agencies along with the final report. The Commission reserves the right to modify proposed changes to project structures or operation.

Article 403. The licensee shall operate the International Falls Hydropower Project to achieve the maximum allowable lake elevation for Rainy Lake, based on the existing International Joint Commission (IJC) rule curve, from ice-out to 15 days thereafter, for the protection and enhancement of fish spawning in the lake. Further, immediately following the 15-day period, the licensee shall allow the Rainy Lake elevation to gradually rise to the summer lake levels and then to be maintained at these levels, as prescribed by the existing IJC rule curve.

Article 404. The licensee shall develop and implement a cultural resources management plan (plan) to protect significant archeological sites and any remains of historic sites within the project boundaries and outside the Voyageurs National Park (VNP). The plan shall be based on the National Park Service's (NPS) cultural resources management plan for the VNP and on the recommendations of the NPS and the Minnesota State Historic Preservation Officer (SHPO), and shall provide for: (a) an inventory of the archeological sites that are affected by water fluctuations and that are potentially eligible for inclusion in the National Register of Historic Places; (b) and assessment of the nature and extent of the project's impacts on these sites; (c) procedures for documenting the significance of the sites and for mitigating or protecting significant sites; and (d) periodic revisions of the plan based on any new schedule of water fluctuations within Rainy Lake that would affect the sites. The licensee shall within 2 years from the date of issuance of the license, file for Commission approval the plan proposed for implementation. Letters of comment from the SHPO and the NPS shall be included with the filing. The license shall also file for Commission approval within 5 years from the date of issuance of the license, a report containing the results of the implemented plan. Comments from the SHPO and the NPS shall be included with the filing. Under the guidelines established in the plan, the licensee shall file management procedures to protect significant sites, within 1 year after the date of any change in water fluctuations under the present IJC rule curve or under any new IJC rule curve for Rainy Lake, if it is determined that such fluctuations will further affect these sites. The licensee shall make available funds in a reasonable amount for any such work as required. If any previously unrecorded archeological or historical sites are discovered during the course of construction or development of any project works or other facilities at the project, construction activity in the vicinity shall be halted, a qualified archeologist shall be consulted to determine the significance of the sites, and the licensee shall consult with the SHPO to develop a mitigative plan for the protection of archeological or historical resources. If the licensee, the SHPO, and the NPS cannot agree on the amount of money to be expended on archeological or historical work related to the project, the Commission reserves the right to require the licensee to conduct, at its own expense, any such work found necessary.

APPENDIX C

STEERING COMMITTEE
MEMBERSHIP, GROUNDRULES AND PROCESS

Rev. April 15, 1992

RAINY LAKE / NAMAKAN CHAIN INTERNATIONAL WATER LEVEL STEERING COMMITTEE

OPERATING GROUNDRULES

The governments of the United States and Canada, the Province of Ontario and the State of Minnesota, and the Boise Cascade Corporation have jointly formed an International Steering Committee to address issues related to the regulation of water levels on Rainy Lake and the Namakan Chain of lakes. In order to facilitate the discussion of these issues and other matters associated with the conduct of its business, the Steering Committee has adopted the following Operating Groundrules.

I. Membership

A. The committee recognizes the following list of agencies and individuals as constituting the membership of the committee:

Public (Canada):	Geoff Gillon
	Dennis McDougall
	Allan Kielczewski (alt.)
Public (U.S.):	Joe Boyle
	Tom Worth (alt.)
	Tim Watson (CCVNP)
	David Dill (alt. CCVNP)
Canada (Federal):	John Lunny - Coast Guard
Canada (Provincial):	Bill Darby - Ontario MNR
	Randy Wepruk (alt.)
U.S. (Federal):	Ben Clary - N.P.S.
	Larry Kallemeyn (alt.)
U.S. (State):	Paul Radomski - Minnesota DNR
	Ken Wald - Minnesota DNR (Alt.)
Boise Cascade:	Mike Romslo
	Jim McQuarrie (alt.)

B. Bill Darby and Paul Radomski will serve as co-chairs of the committee and, as such, will act as spokesmen for the committee.

C. New representatives can only be added by the consensus of the committee.

D. Individuals other than those listed above are welcome to attend committee meetings as observers but may not address the committee unless a member recommends, and the committee agrees, that they be allowed to do so.

II. Scope

A. The geographic scope is defined as the area regulated by the International Rainy Lake Board of Control.

B. The scope of issues to be addressed by the committee is as follows:

Water level management on Rainy and Namakan Reservoirs
- analysis of system operation
- hydropower
- benefits and risks

Downstream impacts

Upstream impacts

Legal requirements

Public consultation, information and education

III. Committee Product Phases

The committee product includes the following three phases:

1) Define a process for developing a recommended water level management plan.

2) Recommend whether or not a proposal for a change in water level management should be made.

3) Develop a proposal for a water level management change, if required.

IV. Additional Operating Groundrules

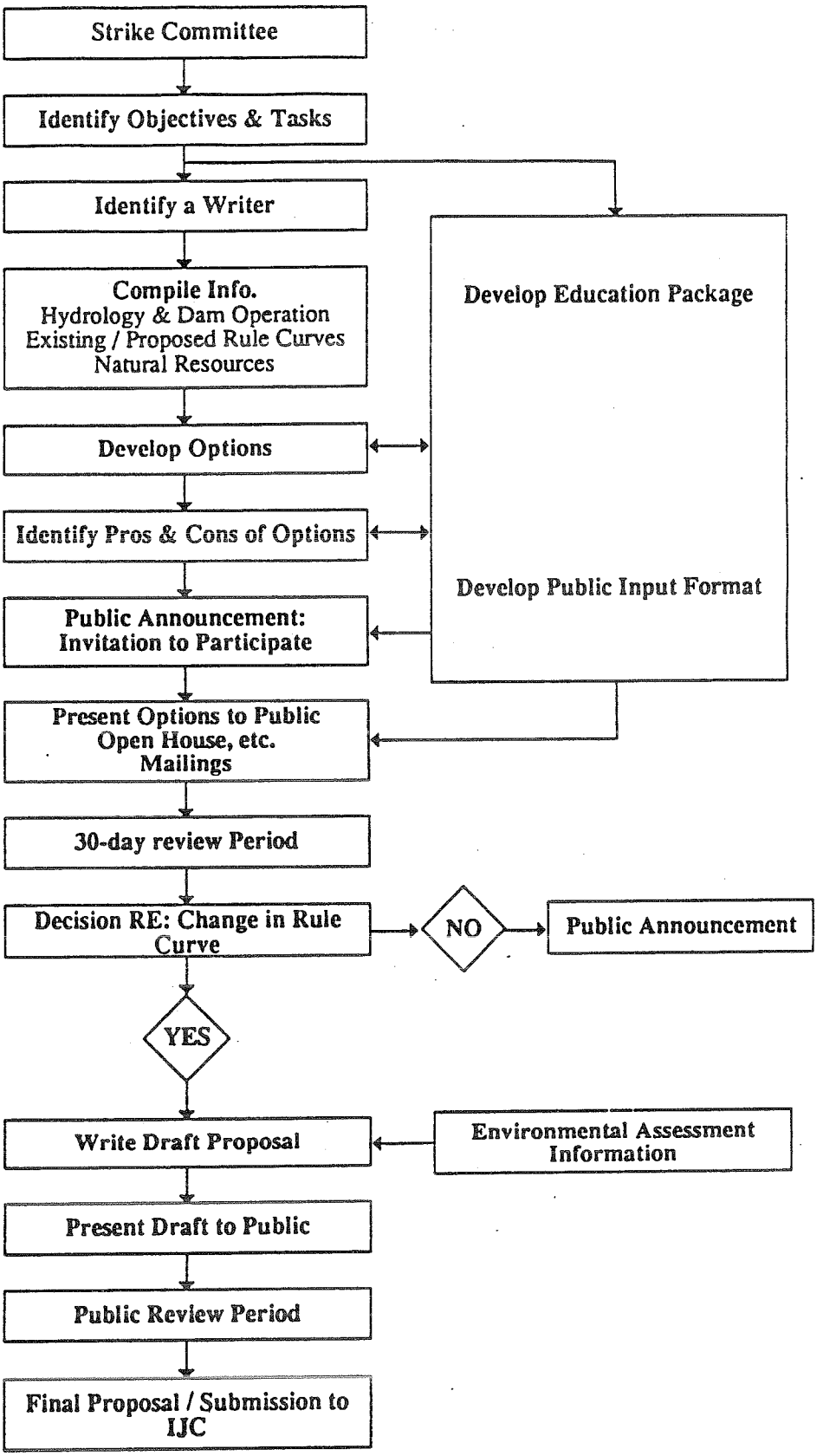
A. **Media**: 1) any news releases about the committee will be issued through the committee co-chairs after committee review; 2) committee members agree to circulate for review any draft articles or other publications about the committee prior to release.

B. **Working Relationships**: the members agree to conduct a good faith effort to achieve the committee objectives through an open, creative process.

C. **Public Involvement**: 1) the co-chairs will allow time for public comment on the agenda for each meeting; 2) the committee will sponsor open public forums if needed; 3) observers are welcome to attend committee meetings but may only address the committee if a committee member recommends that they do so and if the committee concurs.

D. **Decision Making**: the committee will use a consensus approach to decision making requiring the substantial agreement of all committee members.

Rainy / Namakan Water Level Management
Flowchart for Steering Committee Process



APPENDIX D

STEERING COMMITTEE MEETING SUMMARIES

DRAFT

RAINY LAKE / NAMAKAN RESERVOIR WATER LEVEL

INTERNATIONAL STEERING COMMITTEE

MEETING SUMMARY - AUGUST 27, 1993

1. Attendance:

Members

Joe Boyle	U.S. Citizens
Larry Kallemeyn	Voyageurs National Park (for Clary)
Geoff Gillon	Canadian Citizens
David Dill	U.S. Citizens (CCVNP-for Watson)
Paul Radomski	MNDNR (Co-Chair)
Bill Darby	OMNR (Co-Chair)
Russ Summer	Boise Cascade

Alternates/Observers

Ken Wald	MNDNR
F. R. Bokorney	Citizen
Tom Worth	RLSFC

2. Report on IJC Requirements:

Paul Radomski reported to the Steering Committee on information he gained from IJC officials in Washington and Ottawa. Rita Koerer [?] (IJC staff Washington) reported that the September IJC meeting is primarily for Board presentations to the commission. The Rainy Lake Board of Control, which has jurisdiction in the Steering Committee study area, had not requested any time on the agenda for presentation regarding the Steering Committee recommendations. Rudy Koop (RLBC Ottawa) suggested that the Steering Committee use the RLBC as a reviewing council for the Final Report and Recommendations prior to sending an application to the IJC. The RLBC would be able to offer advice on making sure the Steering Committee report contains the kind of information that the IJC will require as well as having it presented in an appropriate format. Don Parsons (IJC staff Washington) suggested that the RLBC should be the final review panel for the Steering Committee report, that the application for action by the IJC must be submitted according to the IJC rules, that the IJC would likely require some type of administrative review of the Steering Committee report before hearing a formal presentation from the Committee, and that it is possible for the IJC to meet in a special session to hear the Steering Committee presentation.

Based on this information it was agreed that the Steering Committee would not seek to make an appearance at the September IJC meeting but would proceed to make final revisions to the report and submit it as soon as possible (October 1 deadline) to the IJC for their consideration. Copies of two drafts of the transmittal letter to the IJC were distributed. Members should review the drafts and submit comments to either the co-chairs or Don Buckhout.

3. Responses to Public Review Comments

Paul Radomski and Bill Darby had compiled all comments received during the public review period. Approximately 45 responses were received. The ratio of positive comments to negative was consistent with earlier public responses--approximately 80 percent in favor and 20 percent opposed to the recommendations. A letter of comment

from MNDNR Commissioner Sando suggested an addition to the recommendations for additional hydrologic analysis. Jim Sanborn expressed concern that the water levels at Kettle Falls do not necessarily reflect the conditions at Crane Lake and that at certain times Crane Lake levels are several inches higher.

Boise Cascade also submitted comments on the Steering Committee report in the form of three studies conducted by outside consultants to evaluate the flood damage potential, the fisheries studies and the wildlife studies that support the proposed recommendations. The Steering Committee addressed these studies and the accompanying letter from Mr. Baxendale. (See Item 5 below for summary of Steering Committee response to Boise Cascade comments.)

4. Report/Recommendation Modifications in Response to Comments:

In view of the comments received, the Steering Committee examined sections of the report and recommendations to consider modifications that would address the comments.

The Steering Committee addressed Sanborn's and others comments and acknowledged that water level differences within the Namakan Reservoir do exist depending on inflow conditions and the effects of topography. Members agreed to a modification of the text for recommendation V.B. to address those concerns as follows:

> *[Add to 3rd par. pg. 44]* The addition of a water level gauge on Crane Lake, where lake levels vary with respect to Kettle Falls readings, would provide important low and high water level data on the upper part of the Namakan Reservoir. This would provide a mechanism to advance the existing water level management system to one of a reservoir-wide strategy. The compilation and use of these data, as they become available, by computer models would improve water level management by providing dam operators with information and a list of potential management options rapidly.

In order to address comments from the Minnesota DNR and the Ontario MNR the following recommendation was added to Section V. of the Report:

> *[Add new C. change subsequent recommendation letters]* **The Steering Committee recommends that the IJC conduct a hydrologic analysis of the Steering Committee recommendations.** The Steering Committee used peer-reviewed research, refereed scientific publications, and independent expert opinion in analyzing the existing water level management system and its recommendations. However, the Steering Committee did not have the resources to conduct its own hydrologic modeling. It relied heavily on the SIMUL8 hydrologic model developed for Boise Cascade by Acres International Ltd. and a model developed by the U. S. National Park Service. Because of the IJC authority and expertise in dealing with large-scale water systems, the Steering Committee feels that it is appropriate for the IJC to conduct the independent and objective hydrologic analysis of these systems and to determine the effects of the recommendations on flood-prone properties.

In addition, modifications were made to Recommendation V.B.:

> *[Add to recommendation text on pg. 44]* **Specifically, the Steering Committee recommends improvements be made in hydrologic monitoring and modeling of the drainage basin to facilitate anticipation of high and low flow into Rainy Lake and Namakan Reservoir and to improve water management.**

[Add to beginning of para. 3] Better hydrologic monitoring and modeling of the watershed would improve the forecasting of flood peaks, enabling better control of the peaks through dam operations.

Text clarifying the use of hydrologic models was added to page 49 as follows:

[Add to para. 2 after 3rd sent.] Simulated water levels from the models comply better to the rule curves than water levels actually recorded in the past. Although some models can be trusted to provide accurate comparisons of different rule curves, they may not reflect the extremes experienced in water levels historically or in the future.

5. Response to Boise Cascade Consultant Studies:

The Co-Chairs reported that they are seeking objective, scientific analysis of the three consultant studies submitted by Boise Cascade.

In general the following response was agreed to:

1) Continue expert review and analysis of the studies.

2) Radomski, Darby and Kallemeyn will examine the fish and wildlife sections of the Steering Committee Report in light of the consultant studies; if changes are needed, send out proposed changes to the Steering Committee for review.

3) Co-chairs to send a response letter to Richard Baxendale (Boise attorney) indicating how the Steering Committee is handling Boise comments.

4) A new section will be added to the Steering Committee Report that includes the response to comments received on the Public Review Draft; this section will include a summary of the Boise consultant study comments and how the Steering Committee responded, so far.

6. Presentation Before Citizens Council on Voyageurs National Park Meeting:

Paul Radomski will represent the Steering Committee at the CCVNP meeting on August 28 and request their endorsement of the Steering Committee recommendations. The Steering Committee authorized Paul to present the recommendations as final, including additions at this meeting, with the understanding that some parts of the report text may be modified as a result of further analysis of the Boise consultant studies (item 5.2 and 5.5 above).

7. Next Meeting:

No date was set for a next meeting. Co-chairs will call a meeting as needed.

RAINY LAKE / NAMAKAN RESERVOIR WATER LEVEL

INTERNATIONAL STEERING COMMITTEE

MEETING SUMMARY - APRIL 14, 1993

Location: OMNR Headquarters, Fort Frances, Ontario

1. Preliminaries:
The agenda and summary of the previous meeting were approved without revision.

2. Correspondence / Items of Interest:

a. Rainy Lake Board of Control Meeting: Bill and Paul reported on this March 23 meeting between some of the Steering Committee members and the Rainy Lake Board of Control. The co-chairs gave the RLBC a summary of the status of the Steering Committee's work and received advice and information on presenting the Steering Committee's report to the IJC. The RLBC indicated that the IJC will meet in Washington in April and in Ottawa in September. The RLBC is also willing to preview information prepared by the Steering Committee for a presentation to the IJC and offer suggestions on how it might best be presented. At the evening session with the public the RLBC received a variety of comments on all sides of the water level issue, according to Steering Committee members who were there.

b. Boise Cascade Studies: Mike Romslo summarized the three studies that Boise Cascade has contracted for relative to the work of the Steering Committee. The first is a study of the potential for flood damage from water level management schemes. This study is being conducted by Acres International. At this point the consultant is conducting a flyover of shoreline properties to get a general idea of the potential types of development that could be affected. Mike expects that this study will be completed in late May or early June. Paul Radomski commented that he would like to see this study be as objective as possible, so that it might be of use to the Steering Committee. Boise Cascade has also contracted with Dr. Benjamin Parkhurst, Laramie, Wyoming, to provide an analysis of the recent studies conducted by others to analyze the impacts of water level fluctuations on fish and wildlife resources. This report is due at the end of May. Finally, Rick Carsons of Acres International has just completed an analysis of the potential hydropower and flooding effects of the existing IJC rule curves and the Steering Committee proposed rule curves. The co-chairs will be sending a letter to Mr. Carsons requesting clarification of some of the assumptions and findings of that study, in particular why the storage effect of Namakan Reservoir has been excluded.

c. Border Lakes Association: Jim Sanborn from BLA reported on the preliminary findings of Professor Tinker (University of Wisconsin-Eau Claire) regarding the study commissioned by the BLA to study the validity of the Acres International hydrologic model and to assess the potential for shoreline property damage from high water events. The consultant is awaiting additional information from Acres International regarding the details of the model. Mr. Sanborn also indicated that a detailed quantitative analysis of the flood damage potential will probably not be accomplished by Professor Tinker.

d. Minnesota DNR Analysis: Ken Wald reported on the internal review process that is beginning within the DNR to analyze the Acres International hydrologic model and to seek consensus on the potential high water events resulting from the existing and proposed rule curves. Ken proposed a meeting of representatives of all concerns who have expertise in hydrologic analysis to see if there can be some consensus on the potential hydrologic effects of the alternate rule curves. The Steering Committee

endorsed such a meeting and encouraged the DNR to conduct it as soon as possible.

e. CCVNP Meeting: Milt Knoll, CCVNP Chairman, explained how the CCVNP at their May 1 meeting will be considering the work of the Steering Committee. Milt indicated that the most the CCVNP could do would be to pass a resolution on the general concept of the Steering Committee products to date. Any final endorsement or other action would have to wait until the Steering Committee has issued its report in final form. Milt also mentioned that CCVNP members will be meeting with the U.S. congressional delegation in Washington on lake management issues.

3. Report Revisions:
The Steering Committee identified sections of the Final Report that are still missing and secured commitments from members to complete those sections.

a. Executive Summary: Don Buckhout agreed to draft this and have it available for review prior to the next meeting. He will also provide a list of the conclusionary statements and recommendations for discussion and approval at the next Steering Committee meeting.

b. Flug Model Impacts: Larry Kallemeyn has provided.

c. Economic Impacts on Namakan Reservoir Tourism Business: Tim Watson will convene a meeting of local resort operators to prepare this information.

d. Liability Issues: Joe Boyle will restate information provided to the Steering Committee at an earlier meeting by Boise Cascade attorney Richard Baxendale.

e. Dredging Permit Requirements: Bill Darby will provide OMNR's restrictions on dredging access channels for larger boats during low fall water that may result from Steering Committee rule curve changes. This would fit on pages 60-61 of the second draft.

f. Impacts of Proposed Rule Curve on Rainy Lake Water Quality: Larry Kallemeyn to provide this.

g. Impacts on Navigation from Low Water: Paul Radomski will look at the duration curves to determine how the two sets of rule curves compare with respect to the frequency of low water events that will hinder or prevent navigation.

h. Analysis of Acres International Flood Event Predictions: Paul will also write a section on the limitations of the Acres model based on correspondence between Rick Carsons and the co-chairs.

i. Beneficial Impacts of SC Proposed Rule Curve on Fish and Wildlife: Paul Radomski to cut through all the scientific rhetoric and provide a clear concise summary for the evaluation section of the report.

In general, the Steering Committee indicated that the report sections should be consistent with the information brochure presented at public consultation meetings last fall.

5. Tentative Schedule for Submittal to IJC:

The Steering Committee set a tentative schedule for preparation and review of final

documents and submittal of a proposal to the IJC. The schedule is as follows:

June 1	Public Review Copy of Final Report Completed
June 15	Copies available for public review
July 15	End of Comment Period
August 1	Submit report and Application to IJC

6. Miscellaneous Items:

a. Photographs: Geoff and Larry will try to get slide photographs of relevance to the Steering Committee report for presentation to the IJC.

b. MDNR Attendance at April IJC Meeting: The Steering Committee requested to Paul Radomski that Kent Lokkesmoe (Division of Waters-DNR) not make any reference to the Steering Committee proposal at his upcoming meeting with the IJC.

7. Next meeting:

Next meeting will be on Thursday, May 13 at the Kabetogama Visitors Center. It will be an all day, and possibly all night, meeting.

8. Meeting Attendance:

Members	Representing
Mike Romslo	Boise Cascade
Tim Watson	U.S. Citizens (CCVNP)
Joe Boyle	U.S. Citizens
Bill Darby	Canadian Province (OMNR)
Ben Clary	U.S. Federal (VNP)
Dennis McDougall	Canadian Citizens
Paul Radomski	U.S. State (MDNR)
Geoff Gillon	Canadian Citizens

Alternates

Ken Wald	MDNR
Larry Kallemeyn	VNP
Allan Kielczewski	Canadian Citizens

Observers

Milton Knoll	CCVNP
Jim Sanborn	BLA

RAINY LAKE / NAMAKAN RESERVOIR

WATER LEVEL MANAGEMENT

INTERNATIONAL STEERING COMMITTEE

MEETING SUMMARY - FEBRUARY 17, 1993

1. Preliminaries:

a. The agenda for the meeting was changed to add the following items: 2a. Boise Cascade position paper; 2b. Acres International report; 2c. Decision on Recommendation.

b. Summary of the December 2 meeting was revised according to comments from Steering Committee (S.C.). members. Final summary with changes will be sent out in next mailing as usual.

2. Correspondence/Items of Interest:

a. Bill Darby reported on his response to letters received from citizens on the Seine River system, including Marmion Lake. The essence of the response is that the river and lake levels in that portion of the watershed are controlled by dams at Calm Lake and Crilly and they are not affected by Rainy or Namakan dam operation nor would any of the S.C. proposals affect those upstream levels.

b. Paul Radomski reported that in response to letters to interest groups requesting endorsement of the Steering Committee proposal, letters of support were submitted from the Koochiching Sportsman's Club and the Stewardship Alliance.

c. Paul also updated brochure responses, which continue to be sent in. So far, including feedback from public consultation meetings in the late summer and fall, the results are:

Rainy Lake interests: 111 YES, 28 NO, 8 UNDECIDED
Namakan or both interests: 36 YES, 5 NO, 0 UNDECIDED
Totals: 147 YES, 33 NO, 8 UNDECIDED.

d. Tim Watson and Ben Clary summarized the results of the Citizens Council on Voyageurs National Park meeting on February 9th in St. Paul. Ken Wald made a presentation to the CCVNP regarding the status of the S.C. work. The CCVNP indicated that they will postpone making any recommendation on the S.C. proposal until after the see the results of the Border Lakes Association study on flooding and property damage issues. The CCVNP requested the BLA to present the results of its study in April.

2a. Boise Cascade Position Paper:

Mike Romslo distributed copies of Boise Cascade's latest position paper on the results of the Steering Committee's work to date (see attached).

2b. Acres International Study Results:

The final report of Acres International, commissioned by Boise Cascade, was discussed by the S.C. The following points came out of the discussion:

- changes in Ontario Hydro rate structure could be the reason for the increase in lost hydropower revenue compared with the earlier analysis.
- why have there not been any significant high water events since 1974 for either the simulated existing or proposed rule curves?; is this from changes in dam operation or simply lower inflows?; is there really a current high water risk or was that a thing of the past?; the model results are based on the assumption that 1956-1992 are representative years.
- what effect on prediction of high water events does the model parameter to target the upper 3/4 of the rule curve have?; in real life potential high water situation the

operator would try to stay in the lower part of the rule curve band.

- the S.C. report should indicate how operation and inflow prediction can mitigate spring flood risk indicated by the model.
- the S.C. report doesn't address the potential benefits and losses of tourism industry revenue related to fish and wildlife habitat condition in the system; the report should recommend further study of the costs/benefits of current and proposed rule curves on the recreation based economy.

2c. Recommendation Decisions:

The S.C. evaluated two decision outcomes options for the report:

1) Pursue Consensus: develop a recommendation all members can live with.
2) Summarize All viewpoints in the report and recommend the majority alternative.

As a result of polling of the S.C. members present, it was determined that the group could not reach consensus on a recommendation to support the S.C. proposed rule curve.
It was decided to select option 2) above.
The S.C. determined that the Final Report should recommend the proposed rule curve to IJC, but that it should be presented in an objective, factual and credible manner with the pros and cons indicate.

3. Consideration of Change in Rainy Lake Rule Curve:

Bill Darby questioned whether the S.C. should consider changing the date at which the top line of the Rainy Lake proposed rule curve should start to rise from March 20 to April 1. After discussion it was determined that the duration curves indicated that water levels would be outside the rule curve approximately 50% of the years if the rise were shifted to begin on April 1. It was decided not to make any changes to the S.C. proposed rule curve.

4. Discussion of Draft S.C. Report Content and Format:

It was determined that the report needs an introduction and some transitional paragraphs, which Don Buckhout as editor will draft.
Bill, Paul and Larry will meet to consider consolidation and editing of the section II. B. fisheries impacts and section III. D. rationale for change portions as there is a substantial amount of overlap in these parts. It was suggested that the rationale for change section simply be a listing of all the points in favor of a new rule curve.
The format questions on the cover memo were resolved as follows:

1) Outline format for overall report is ok.
2) Style should be for public citizen audience rather than scientific/technical audience.
3) Format for measurements should be English with metric in parentheses.
4) Larry Kallemeyn will supply a map showing the overall study area.

Further review and revisions of the report were determined to follow this schedule:

February 26 - Comments to Don on the current draft
March 5 - Provide missing sections of report according to previous assignments
March 15 - Don sends out revised draft
March 30 - Send comments to Don on revised draft
April 7 - Don sends out Final Draft based on comments
April 14 - Next S.C. meeting to review Final Draft

5. Assignments:

Mike Romslo: revise and re-write hydropower and flooding sections
Ken Wald: will revise Section I

Bill, Paul, Larry: will meet and consolidate Section II.B and Section III.D.

Geoff Gillon: will write new Navigation Impacts Section V.A., access to docks, yacht club fall access impacts, houseboat access.

Don Buckhout: Revise draft to incorporate comments and additional sections; mail out according to review schedule.

6. Next Meeting: April 14, 1993; Ft. Frances; Main Conference Room, Ontario Ministry of Natural Resources, 922 Scott Street.

7. Attendance:

MEMBERS	
Geoff Gillon	Canadian Citizens
Dennis McDougall	Canadian Citizens
Tim Watson	U.S. Citizens (CCVNP)
Ben Clary	Voyageurs National Park
Paul Radomski	Minnesota DNR
Bill Darby	Ontario MNR
Mike Romslo	Boise Cascade
ALTERNATES	
Tom Worth	U.S. Citizens
Larry Kallemeyn	Voyageurs National Park
Ken Wald	Minnesota DNR
Allan Kielczewski	Canadian Citizens
OBSERVERS	
Jeff Eisler	Minnesota DNR

RAINY LAKE / NAMAKAN RESERVOIR WATER LEVEL MANAGEMENT

INTERNATIONAL STEERING COMMITTEE

Meeting Summary - December 2, 1992

Location: Ft. Frances Community Credit Union

1. Preliminaries:
The agenda for the meeting was adopted with the addition of discussion of the recent newspaper letter to the editor and response. The summary of the November 5 meeting was approved with revisions (see attached).

2. Correspondence:
   a. Regarding the letter Tom Worth sent to the newspaper, Paul Radomski reported that he talked with Tom and Tom realized that he should not have presented his comments to the newspaper without first checking with the Steering Committee, as this was not consistent with the Committee's operating guidelines. Paul reminded the other members to adhere to the guidelines.

      In describing the response to Tom's letter, Bill Darby remarked on how easy it is to misinterpret the data from the Acres International analysis and in particular to compare "apples with oranges". He cautioned other steering committee members to make sure that they compare simulated projected high water events with simulated historical, and not actual historical, events. The simulated projections, however, assume that the dams are operated the same way they have been in the past.

      Geoff Gillon informed the Committee that his analysis of high water events (from Acres Int. Table 5, 7/30/92) showed that there is an associated historical high water spike with every projected high water spike except for one year. The variation is in the amplitude of the high water.

   b. A comment letter from Allan Meadows and Myrna Ahlgren was noted and added to the correspondence file.

3. Status of Public Consultation:
   a. Response to latest Public Information Brochure was reported by Paul Radomski. Of 112 total responses, there were 83 YES, 24 NO and 6 UNDECIDED. The Rainy Lake Sportfishing Club mailed brochures to its membership and of 41 responses there were 34 YES, 6 NO, and 1 UNDECIDED. In general, those in favor of the proposal support the navigation improvements and benefits to the environment. Those opposed to the proposal are concerned about risk of flooding.

      Of particular interest were three responses received by Bill Darby from people upstream on the Seine River system. People there are concerned that modifications in water levels on Rainy Lake could adversely affect water supply in the Seine River system. Bill said that he would contact Boise Cascade on this matter and reply to the letters.

   b. The proposed Emo area meeting is still pending.

c. Bill said he is making slow progress in getting together with First Nation groups. He has met with Couchiching F. N. and expects to meet with Red Gut Bay F. N. next week and Seine River F. N. in the weeks ahead. The response from Couchiching leaders was generally favorable to the Steering Committee's proposal.

d. The follow-up on people who attended the Canadian public input meetings and did not return a questionnaire is continuing. Some responses are still coming in.

e. Paul Radomski submitted a draft of a proposed letter from the steering committee to the leaders of special interest groups requesting a formal response from their group to the proposal. The steering committee suggested several changes to the letter.

4. Discussion of Modifications to the Draft Rule Curves:

a. Regarding the Rainy Lake curve there was initial concern about the need to modify the rule curve to try to reduce the spring high water risk based on input at the public meetings. However, after considerable debate, it was decided to leave the curve as originally proposed because the committee determined that the only significant way to reduce the spring high water risk is to store more water in the Namakan system (i.e. increase the proposed drawdown of Namakan), or move the Rainy Lake peak from June 1 to July 1, as it is currently. Both of these changes are judged to have unacceptable environmental effects for restoration of aquatic habitat in the Namakan system and for shore-nesting birds and fisheries on Rainy Lake. The shape and slope of the proposed rule curve in April and May is intended to enclose the most probable water levels (i.e. 80 percent).

b. The Steering Committee reviewed the Namakan system curve based on public comments received. Two modifications were suggested by people who depend on the Loon River for navigation. The first is to extend the bottom line of the rule curve at 1117.0 through the month of October. The second is to raise the top line of the rule curve in August, September, and October in order to allow for balancing reservoir levels with flows in the Loon River. People who navigate the Loon River in the autumn believe that low flows in the river can be compensated for by a "damming effect" if reservoir levels are kept higher with no summer drawdown. Such a scheme would not be necessary every year. The Steering Committee decided not to make any changes in the proposed Namakan Reservoir curve at this time. Bill Darby agreed to pursue these concerns further with members of the Lac La Croix First Nation.

5. Steering Committee Final Report:

a. There was considerable discussion of the disposition, review, and audience of the final report. Several options were offered and discussed. One option is to write an objective report to IJC analyzing the pros and cons of the status quo and the steering committee proposal. This report would not require endorsement of the Steering Committee members. A modification of this option is to have the report go to the government agencies and Boise Cascade for review and endorsement prior to being sent to IJC. Another option is to write a draft report that would be submitted to the U.S. Federal Energy Regulatory Commission (FERC) for

a preliminary review prior to being sent to IJC. It was also discussed how the Boise Cascade Water Level Management Plan would relate to the Steering Committee report. Mike Romslo indicated that Boise Cascade is not certain at this point whether or not they would endorse the Steering Committee report and how well it would meet the FERC license requirements.

It was generally agreed to proceed with writing the report including the recommendation for a new pair of rule curves, but making sure that the impacts of the new curves are thoroughly and objectively explained. The Committee basically endorsed submitting the report for review and endorsement of the government members' agencies and Boise Cascade prior to sending it to IJC and FERC.

b. The draft report outline, which was enclosed with the notice of the meeting, was reviewed and revised by the committee. Assignments for writing various report sections were made. (See attached Final Report Outline.) Don Buckhout agreed to compile and edit the drafted sections and have a draft report available at the next steering committee meeting. It was decided to set a deadline of January 15, 1993 for submitted initial draft sections to Don. He will compile and edit them and return a draft copy to members by the beginning of February for review prior to the next steering committee meeting.

6. Next Meeting:
The next steering committee meeting was set for February 17, 1993 in Minnesota. The main agenda item will be a review and approval of the draft final report contents.

7. Assignments:

Paul Radomski: revise and mail out letter to special interest groups; conduct Emo area meeting; report writing.

Bill Darby: continue First Nation consultations; report writing.

Don Buckhout: compile report drafts for mailing by the end of January.

Dennis McDougall: assist Bill in conducting Emo area meeting.

Larry Kallemeyn/Ben Clary: report writing.

Mike Romslo: report writing.

RAINY LAKE / NAMAKAN RESERVOIR

WATER LEVEL MANAGEMENT

INTERNATIONAL STEERING COMMITTEE

November 5, 1992 - Meeting Summary

Location: Rainy River Community College

1. Preliminaries:
A presentation by Rick Mollin and Oscar Bergstrom, Border Lakes Association, was added to the agenda. The summary of the July 21 meeting was approved.

2. Correspondence / Items of Interest:
a. A letter from the Ash River Trail Commercial Club supporting the steering committee proposed rule curve for the Kabetogama-Namakan Basin was circulated for review.
b. Support letters have been received from the Northwestern Ontario Tourism Association, Valley Opportunities (Ft. Frances), and a support letter is expected from the Kabetogama resort owners. Bill Darby also expects to receive a letter outlining the concerns of the Lac La Croix First Nation.
c. Bill Darby announced that he plans to meet with the Couchiching First Nation on November 9th.

3. Presentation by Border Lakes Association:
Rick Mollin and Oscar Bergstrom from the Border Lakes Association addressed the steering committee regarding a study they are commissioning to verify the results of the Acres International hydrologic study and to estimate the potential flood impacts that would result from the steering committee's draft rule curve proposal. They requested that the steering committee delay making a final decision on a recommended rule curve change until the results of the BLA study are available in late winter 1993. After questioning by the committee members, it was clear that the BLA concern focuses on flooding potential on Rainy Lake and they are not particularly opposed to the proposed changes to the Namakan rule curve. The steering committee, while expressing appreciation for the BLA's willingness to inform them about the additional analysis, was reluctant to commit to delaying its process schedule until they had an opportunity to discuss the remaining agenda items. The schedule would be reevaluated at the end of the meeting.

4. Summary of Public Consultation Process Results:
Bill Darby and Geoff Gillon reported on meetings with the Bait Fish Association and groups of citizens from Rocky Inlet, Reef Point, Hopkins Bay and Bears Pass as generating fairly neutral responses and low return on questionnaires distributed at the meetings. They had a much better return on brochures mailed out with results of 51 returns in favor of the proposal and 3 opposed. A possible explanation for the general Canadian support or neutrality on the proposal is the relatively low risk of flood damage because of topography and previous Crown control of the shoreline area. Bill Darby still expects to meet with First Nations leaders in the coming weeks. The response from the joint city councils meeting was described as curious but noncommittal at this time.

The steering committee decided that this initial round of the public consultation process will be completed when the following have occurred:

1) Brochure responses on the U.S. side will be collected through November 30;
2) Another public meeting is held for people in the Emo area;
3) Additional First Nation consultations are held;
4) Canadian citizens who attended public meetings and failed to return questionnaires are followed up with phone calls; and
5) A letter is sent to special interest groups who have not yet responded to the proposal requesting their opinions and input.

The committee set the date of November 30 for the completion of the public consultation process.

Tom Worth and Tim Watson expressed the concern that Boise Cascade is not being open about their preferences in the Steering Committee negotiations on rule curve development and modifications. They would prefer to have Boise be more actively involved in the discussions and believe that a veto from Boise for any rule curve changes would be unfair to the process if Boise has been unwilling to seek to have their concerns addressed through the process of trade-offs and compromise. In response, Mike Romslo said that Boise's preference for the 1970 has always been their position and they have brought this up whenever asked. However, they also have indicated a willingness to consider and not rule out changes based on the work of the Steering Committee and have indicated this willingness by providing consultant services to the committee for analysis purposes.

5. Steering Committee Final Report:
It was agreed that the steering committee will present its final decision on water level management changes in the form of a final report to the IJC. This report will be produced regardless of whether or not a change in rule curves is recommended. In order to focus the remaining tasks of the committee, report writing task will begin with the development of a report outline to be prepared by the committee facilitator, Don Buckhout. Steering committee members who have reports that follow a format that may be appropriate for the steering committee report will send copies to Don for consideration in preparing the outline. The outline will be reviewed and revised as needed at the next meeting and members will be assigned sections to write for compilation and editing later.

6. Revision of Steering Committee Process and Schedule:
The committee decided to revise the process schedule as shown on the flowchart. In general the revisions call for completion of the final proposal in May 1993. A revised flowchart is attached to this summary. The new schedule will allow for consideration of the results of the BLA study in the final public review period.

7. Extension of U.S. FERC License:
Based on the discussion of the schedule, it was decided that Boise would request an extension of the FERC licensing period of one year, from January 1 through December 31, 1993. The co-chairs will again supply a letter of support for Boise's request on behalf of the steering committee.

8. Public Input Period:
Jim Sanborn, BLA, addressed the committee briefly in follow-up to the discussion held earlier in the meeting regarding the BLA study.

9. Assignments:

Bill Darby: continue First Nation consultations, follow-up on public meeting contacts, conduct Emo meeting.
Paul Radomski: prepare press release to notify public about brochure distribution, draft letter to send to special interest group representatives requesting their response.
Geoff Gillon and Dennis McDougall: assist Bill Darby in public consultation process
Don Buckhout: prepare draft outline of the final report, revise process flowchart dates.

10. Next Meeting:
December 2, 1992; Ft. Frances
Agenda items: Report on public consultation process; revisions to proposed rule curve; decision on whether or not to make a recommendation; review of final report outline and assignment of writing report sections.

11. Attendance:

Members

Dennis McDougall	(Canadian citizens)
Geoff Gillon	(Canadian citizens)
Bill Darby	(Canadian province)
Tim Watson	(U.S. citizens-CCVNP)
Mike Romslo	(Boise Cascade)
Paul Radomski	(U.S. state)

Alternates:

Tom Worth	(U.S. citizens)
Larry Kallemeyn	(U.S. federal)
Ken Wald	(U.S. state)
Russ Summer	(Boise Cascade)

Observers:
Richard Mollin
Oscar Bergstrom
Jim Sanborn
Jeff Eibler

RAINY & NAMAKAN WATER LEVEL
INTERNATIONAL STEERING COMMITTEE

July 21, 1992 - Meeting Summary

Location: Ft. Frances Community Credit Union

1. Preliminaries:
A presentation by Paddy Reid was added to the agenda and the agenda and summary of the previous meeting were approved.

2. Correspondence / Items of Interest:
a. Paul Radomski reported on his meeting the previous evening with the executive board of the Border Lakes Association regarding the steering committee process and proposals. In summarizing their concerns, Paul reported that they are most concerned about the flooding potential resulting from an earlier spring water level rise. They could probably live with the curves as proposed, but any approval would be conditional pending the results of an analysis of the proposal by an independent hydrologist to be hired by the BLA.
b. Paul also reported on a meeting with DNR regional staff in Grand Rapids regarding the draft steering committee proposals.
c. The Township of Morson has submitted a letter of support to the steering committee regarding the draft proposals.

3. Revision of Rule Curve Proposals:
The steering committee members reviewed the drafts of the various rule curve graphs that will be presented on the display panels for the public consultation meetings. In general it was agreed to add the 1970 rule curves on each graph for comparison purposes, to add the flood level line at which point IJC requires all gates to be open on the dams, and to make various other adjustments in accord with previous decisions of the steering committee.

4. Paddy Reid (Ontario Ministry of Culture and Communications) Presentation:
Dr. Reid presented general information to the steering committee about the sensitivity of archaeological sites along the shoreline of the lakes. He reported that only about 10% of the shoreline on the Canadian side of Rainy Lake has been surveyed for archaeological resources. He indicated that rapid and extreme fluctuations in water levels cause the most significant damage to these sites and the associated artifacts. He indicated that the steering committee proposed rule curves appear to be an improvement over the existing rule curves in that regard.

5. Revision of Public Display Panels:
The steering committee spent several hours revising the draft panels for the public meeting displays. These changes will be incorporated in a new panel design that will be mailed to steering committee members for further review before developing the final panels. It was also discussed that there should be a separate set of panels that describe the make-up and function of the steering committee. Bill Darby agreed to provide appropriate maps of the study area for use at the meetings.

6. Review of Public Consultation Schedule:
The steering committee decided to reschedule the initial public consultation kick-off meeting for August 20. The format for the meeting would be essentially the same as for the originally scheduled August 5 meeting. The co-chairs will also attempt to schedule the joint meeting of the city councils, the Koochiching County board and the joint chambers of commerce for August 21 (alternate date August 24). The presentation to the CCVNP will be on Saturday, August 22. These dates are still tentative pending the completion of the materials for the displays at the meetings.

7. Public Information and Survey Brochure:
Paul Radomski presented his mock-up of another public information brochure featuring the steering committee proposed rule curves and a questionnaire for obtaining public response. It was decided to keep the questionnaire very simple and direct using Paul's questions 1 and 4 and a space for other comments.

8. Next Meeting:
The steering committee did not schedule another formal meeting. The committee members will meet informally prior to the August 20 public meetings. There will be an August 5 conference call among members and alternates to discuss Acres International analysis results and to review the revisions to the public display panels.

9. Assignments:
Paul Radomski: Revise brochure; set up conference call; revise invitations to organizations regarding the rescheduled public meetings.

Bill Darby: Get maps for public input meetings; set up conference call; revise invitations to organizations regarding the rescheduled public meetings.

Ken Wald: Revise rule curve graphs and public display panels

Attendance:

Members and Alternates

Bill Darby	MNR
Paul Radomski	DNR
Geoff Gillon	Canadian Citizens
Dennis McDougall	Canadian Citizens
Ben Clary	U.S. Federal (VNP)
Tom Worth	U.S. Citizens (Alt.)
Ken Wald	DNR (Alt.)
Larry Kallemeyn	U.S. Federal (Alt.)
Mike Romslo	Boise Cascade

Observers
None

RAINY / NAMAKAN WATER LEVEL MANAGEMENT

INTERNATIONAL STEERING COMMITTEE

MEETING SUMMARY - JULY 2, 1992

1. Correspondence / Items of Interest:

a. Bill Darby and Ben Clary reported on the CCVNP meeting. Bill made a brief presentation to the Citizens Council regarding the status of the Steering Committee's work, including showing them draft rule bands developed by the Steering Committee. Bill reported that questions put to him by the Council members included some about navigation during low water seasons on the Ash River and by sailboats on Rainy Lake, and what methodology the Steering Committee will use to measure public opinion. Tim Watson indicated that Bill's presentation was excellent.

b. Bill Darby reported that Paddy Reid will not be able to attend a steering committee without more advance notice. Bill summarized a report Reid had provided of a 1978-79 Canadian archaeological survey of Rainy Lake. The main problems related to lake water levels are submergence and erosion of artifacts or significant sites. Lower than natural water levels are not a problem, but higher than natural levels are. Ben Clary indicated that Park Service archaeologists say that decreasing fall water levels help to reduce the damage to archaeological sites from fall storms. Dennis McDougall suggested that a letter of support should be requested from Paddy Reid.

2. Finalize SC Rule Bands:

Rick Carson (Acres International) was present to provide on-the-spot analysis of modifications to the SC rule band proposals. The initial discussion related to the need to provide rule bands that have a reasonable chance of being achieved so as not to build false expectations of what the steering committee is able to accomplish. It was generally agreed that any rule bands proposed by the steering committee should be no less reliable than the existing rule bands. Carson's analysis of the Namakan rule band will be revised with a new assumption that the model should track the 3/4 mark of the band. He expects the duration curve result to be more favorable with that change. Other requests to Mr. Carson for analysis of the proposed rule bands include: 1) revise model to use historical discharge rates where the IJC allowed less that 4000 cfs discharge; 2) produce figures 1-7 for Rainy and Namakan using the simulated SC bands, the simulated base flow and the new assumptions; 3) plot on as large a format as possible figures 5, 6 and 7 with the simulated SC rule bands and the actual flow data for public display purposes; 4) produce a summary table of probability by month and the number of days per month when the proposed SC bands would be exceeded or not met; and 5) a summary table of the impacts on hydropower production.

3. Revised Operating Guidelines:

The Steering Committee decided to proposed two draft operating guidelines to maximize the value to the aquatic ecosystem of the proposed rule bands. These would be designated for the normal operating year and the periodic rejuvenation year when water level extremes occur naturally. For public review purposes the guidelines would be shown as a line within the rule bands that the dam operator should try to track. These guidelines were described by the steering committee as follows:

Normal Operating Year:

(Late Nov.-June 1) maintain level in top half
(June 1 - Aug. 31) move level from top half to bottom half
(Sept.1 - mid Nov.) move level from bottom half to top half

Rejuvenation Year:

(Dec.-Mar.) maximize drawdown within band
(Apr.-May) maximize increase within band
(June-Aug.) maximize drawdown within band
(Sept.-Nov.) maintain constant level

4. Public Consultation Issues:

The steering committee decided to begin a list of some of the issues that are likely to be raised during the public review process and develop responses to those issues. So far the items on this list include:

a. Can't a more extensive network of stream guages be used to more accurately predict inflows and therefore manage the levels more precisely?
b. How will ecosystem changes be monitored to show the effects of rule band changes?
c. How long will it take for any benefit resulting from the rule band changes to show up? Will the rule bands be changed back if no benefits are evident?
d. What will be done about the loss of RLYC sailboat access to some areas of the lake because of lake drawdown?

5. Preliminary Schedule of Various Organization Consultations:

It was tentatively decided to have the 30-day public review period from August 5 to September 5. Within that period the steering committee decided to schedule meetings with various relevant organizations as well as the general public. A tentative meeting schedule is as follows:

August 5 [2-5pm; Ft. Frances] Meeting with executive board or chairs of the following groups:
Road Associations (Bears Pass, Back Pt., Reef Pt./Hopkins Bay); Stewardship Alliance; M.T.R.; M.O.E.; M.N.D.M.; M.C.C.; Rainy Lake Guides Assn.; Border Lakes Assn.; Rainy Lake Sport Fishing Club; Rendezvous Yacht Club; Fort Frances Sportsmans Club; Atikokan-Minaki Waterway Corp.

August 5 [7-9pm; Ft. Frances] Meeting for General Public and Selected Organizations (Ducks Unlimited, Int. Falls Snowmobile Club, Sunset Country Snowmobile Assn., Fort Frances Trappers Council, Ontario Bait Fish Assn., commercial fishermen)

Early August [Crane Lake/Kabetogama Area] Meeting for Kabetogama Resort Assn., Ash River-Namakan Lake Assn., Canadian Sand Point Power Assn., Kabetogama-Namakan Sportfishing Committee, Kabetogama Snowmobile Club, Crane Lake Snowmobile Club, Crane Lake Commercial Club.

August 6? [Rainy River Area] Meeting for Cities of Morson and Rainy River, Baudette Chamber of Commerce, commercial fishermen.

Late August [International Falls] Meeting for governmental groups (Ft. Frances and International Falls Chambers of Commerce; City Councils of Ft. Frances, International Falls, Ranier, Emo; Koochiching County Board.

August 20 or 21 [International Falls] Meeting of Citizens Council for Voyageurs National Park.

Paul Radomski agreed to draft a letter inviting organizations to these meetings. Ken Wald will develop a letterhead format for the invitations.

6. Format for Information Displays at Public Meetings:

The steering committee discussed a possible format for displaying the information about rule band modifications. The committee thought it would be helpful to show a graphic with the percentage of compliance with rule band limits for the current (1970) bands and the projected compliance with the proposed bands. For each month the graphic could show the percent chance of water levels attaining specific points both within and on either side of the rule bands.

Bill Darby proposed, and the committee discussed, a possible format for display panels that could be set up on the floor or on tables to show various data, graphs, and information about the work and recommendations of the steering committee. These panels would be used for each presentation made by steering committee members. As discussed, the panels could contain the following:

Panel 1 - Steering Committee Objectives
Process Flowchart
Problems with 1970 Rule Bands

Panel 2 - Various Interest Rule Bands
(Pre-dam natural, Fish and Wildlife, Hydropower, Navigation, Flooding/Ice Damage, Rainy Lk. Wild Rice)
Example of Rule Bands combined

Panel 3 - Steering Committee Draft Proposals
Proposed bands with recommended operating line for normal year and rejuvenation year.

Panel 4 - Impacts of Proposed Rule Bands
Show 1956-1987 actual flow line compared with proposed rule bands flows (Acres Int. model) and list assumptions of the analysis model; list pros and cons of draft proposals in bulleted text.

Panel 5 - How Can You Help?
Information about public consultation and review process that indicates how citizens may have input to final recommendations.

It was agreed that Bill Darby and Tom Worth would work together to refine this concept and develop a full mock-up design.

Paul Radomski will work on a mock-up of a new brochure that can be used as a public information and feedback mechanism in connection with the public review

period. Several ideas for a survey form with general questions to be incorporated in the brochure were discussed.

7. Assignments:

Bill Darby:	Develop rough text and mock-up for panels Check with Dennis McDougall about date for Rainy R. area public consultation. Check with Ft. Frances clerk about joint council meeting with I-Falls to review committee proposals.
Paul Radomski:	Develop draft brochure for public info. Draft letter of invitation to meetings. Contact Joe Boyle about setting up I-Falls city council (joint with Ft. Frances) meeting to review proposals
Tim Watson:	Make initial contacts for Kab area meeting
Tom Worth:	Work with Bill on panel mock-ups
Ken Wald:	Develop computerized rule band graphs Do letterhead mock-up
Larry Kallemeyn:	Pros and cons of Proposal

8. Next Meeting:

July 21, 1992 - 8:30 - 3:30; Ft. Frances Community Credit Union

Meeting Attendance

Members

Geoff Gillon	Canadian Citizens
Mike Romslo	Boise Cascade
Paul Radomski	MDNR
Tom Worth	U.S. Citizens
Tim Watson	U.S. Citizens (CCVNP)
Bill Darby	OMNR
Dennis McDougall	Canadian Citizens
Ben Clary	U.S. Federal (VNP)

Alternates

Ken Wald	MDNR
Larry Kallemeyn	VNP

Observers
F.R. Bokorney
Jeff Eibletz

RAINY/NAMAKAN WATER LEVEL MANAGEMENT

INTERNATIONAL STEERING COMMITTEE

MEETING SUMMARY - JUNE 17, 1992

1. Preliminaries: The steering committee revised the draft summary of the May 27 meeting. Bill Darby indicated that Paddy Reid, who was on the agenda for the meeting, was unable to attend and wished to be invited to address the steering committee at the next meeting. Don Buckhout reported that he had tried to contact Milt Knoll about CCVNP participation without success. Don also mentioned that he would check to make sure the new CCVNP member and alternate were on the steering committee mailing list.

2. Correspondence / Items of Interest:
   a. Several members of the steering committee received copies of a letter from the Rainy Lake Yacht Club regarding their concerns about water level reductions during the navigation season.
   b. Ben Clary informed the steering committee about the upcoming meeting of the Citizens Council of Voyageurs National Park (June 22-23). He circulated a summary of the steering committee status for review and approval prior to presenting it at the CCVNP meeting. It was agreed to approve the status report and to have Bill Darby present the most recent rule curve proposals for the CCVNP consideration. The steering committee will solicit additional input from the CC at their next meeting in August.
   c. Larry Kallemeyn requested and received the steering committee's permission to use copies of the draft rule bands in a paper that he, Paul Radomski and Yousef Cohen are preparing for an upcoming symposium.
   d. MNR "hat awards" were distributed by Bill Darby and appreciated by the committee members.

3. Loon River Survey Report: Bill Darby showed the video of his 5/25/92 survey of the Loon River outlet area and the river channel up to the 56 rapids. The water level at Kettle Falls on the day of the survey was 1116.0. Paul Radomski also reported on the survey by MDNR people on the following day of the same area. The conclusions of both surveys was that a water level of 1117.0 feet is needed for navigation of the Loon River and passage through the 56 rapids. Options for improving navigation and access considered were marking the channel through the mudflats, improving the Dawson portage, a mechanical portage at 56 rapids, and removal of some of the boulders at the 56 rapids.

4. Evaluation of Draft SC Rule Bands:
   a. Hydrologic: There was extensive discussion about the modifications to the Namakan SC consensus rule band. Primarily, the issues were to correct an oversight and raise the top line from 1113.9 to 1114.5 ft. on the first of April, and to try to design the bands so that there is a reasonably high probability that Boise would be able to maintain the water level within the rule band on any given date. Based on the most recent analysis by the Acres International the steering committee decided to request further information as follows: a revision of Figs. 5-7 with extended graphs and the SC rule band simulated water levels compared with the actual historic water levels. The IJC minimum and flood level lines should also be included. These figures should be displayed on panels and in colors suitable for presentation at a public meeting. The steering committee also

requested: 1) a comparison of the simulated base flow (1970) rule bands with the actual flow, 2) the percentage of days for each month (based on the historic record) that the simulated flow for the SC rules bands would be outside the band limits, and 3) an evaluation of the effect on hydropower production of operating within the top half rather than the top 3/4 of the bands. The steering committee also suggested that Rick Carson change the model assumptions to allow for a lower discharge rate (from 4000 to 2500 cfs) during those periods when this was authorized by the IJC. Mike Romslo will attempt to set up a conference call with Rick Carson and other members of the steering committee to discuss the revisions. Bill Darby, Geoff Gillon and Larry Kallemeyn will synthesize this data for discussion at a future steering committee meeting. Bill Darby reported that Water Resources Canada wants to reserve the use of its hydrologic model to evaluate the proposed rule bands for themselves at a later date and has therefore declined to provide a review at this time.

b. NPS Criteria (1990 Report on Regulating Lake Levels): Larry Kallemeyn reported on his analysis of the SC alternative rule bands relative to the same criteria that were used in the 1990 VNP study of lake level management effects on the aquatic ecosystem. In general his review showed some benefits to fish and wildlife resources and late summer and fall flood control. For most of the other criteria there was little or no change over the existing rule bands.

c. An analysis by Ontario Ministry of Environment is still pending.

4. Revision of Rejuvenation Protocols: Paul Radomski distributed copies of revised protocols as discussed at the previous meeting. It was decided that some additional information should be added to indicate the justification and reasons for the proposed operating schemes. Also it was generally agreed that the protocols should henceforth be called operating guidelines to aid the public in understanding what is involved. Paul agreed to further revise the guidelines and to make a distinction between the normal year summer drawdown and the periodic rejuvenation operating guidelines. It was agreed by the steering committee that the draft guidelines and the draft rule bands should be presented together during the public consultation process.

5. Preliminary Approval of Steering Committee Rule Bands: The steering committee discussed the need to get a preliminary consensus from agencies and organizations represented on the committee prior to beginning the public consultation process. This consensus would be on the question: Do you agree that the SC rule bands and draft operating guidelines are sufficiently acceptable to present for public consideration? The issue is: if the public supports the proposed rule bands, would the agencies, Boise Cascade, and organizations represented on the steering committee support their recommendation to the IJC? It was agreed that preliminary consensus can be modified based on input from the public and that a final consensus is needed before any changes would be recommended to the IJC.

6. Public Input Time: No members of the public requested time to address the steering committee.

7. Assignments:

Bill Darby:	Consult with Rick Carson on rule band evaluations; analyze results of next Acres International data for next meeting; assist Ben Clary in presentation to CCVNP
Mike Romslo:	Contact Rick Carson about additional rule band analysis
Larry Kallemeyn:	Analyze information from Acres for next meeting
Geoff Gillon:	Analyze information from Acres for next meeting
Paul Radomski:	Revise operating guidelines as per steering committee direction

8. Next Meeting: Because the steering committee was unable to discuss the format for the public consultations process at this meeting, it was decided to meet within a couple of weeks to address that issue. The next meeting will be in International Falls on July 2 from 8:30 to 3:00.

ATTENDANCE

Members

Bill Darby	OMNR
Ben Clary	NPS-VNP
Paul Radomski	MDNR
Joe Boyle/Tom Worth	U.S. Citizen
Dennis McDougall	Canadian Citizen
Geoff Gillon	Canadian Citizen
Mike Romslo	Boise Cascade

Alternates

Ken Wald	MDNR
Larry Kallemeyn	NPS-VNP

RAINY LAKE/NAMAKAN CHAIN WATER LEVEL MANAGEMENT

INTERNATIONAL STEERING COMMITTEE

MEETING SUMMARY - May 20, 1992

1. Preliminaries: The summary of the May 4 meeting and the agenda for this meeting were reviewed and approved. It was noted that the CCVNP has not been well represented since the membership change. Don Buckhout agreed to call Milt Knoll about this matter on behalf of the steering committee.

2. Loon River Survey: The steering committee discussed the need to conduct a follow-up survey of the Loon River navigation situation with respect to the concerns expressed at the meeting with the Lac La Croix first nation members. The steering committee wanted to synchronize the survey with a water level of 1116 at Kettle Falls, which was expected to occur around May 26. It was finally agreed that a large OMNR boat with Bill Darby and an OMNR conservation officer would attempt to navigate the channel with a smaller MDNR boat and personnel from the Area Fisheries Office. Members of the survey team were encouraged to photograph or videotape the trip. The steering committee also agreed to inform Leon Jourdain and Jim Sanborn about the survey and invite them to observe. It was tentatively agreed that survey would occur on May 26.

3. Acres International (Rick Carson) Evaluation Results: Rick Carson reviewed the main points in the report of the results of his evaluation, at Boise's request, of the steering committee draft rule band alternatives. All of the alternatives would negatively affect Boise's hydropower generation, with the major impact due to reducing water levels on Rainy Lake during the summer. There was substantial discussion of the meaning and interpretation of the various figures in the Acres Report. Much of the discussion focused on the most helpful graphics to use in the public consultation process. It was generally agreed that the Figure 6 information, spread out, and with a line showing the flood elevation and the base or actual flow would be most helpful. It was also suggested that photos of various familiar landmarks on the lakes (e.g. Reef Point, Sand Point, Crystal Beach) taken at times when water levels would represent key levels of the proposed rule bands would also help to give people a good visual image of what the steering committee is proposing. Geoff Gillon and the NPS agreed to collect photos for this purpose. Some members thought that the single interest rule bands or curves would also be important to conveying the breadth of the steering committee's review.

   Another significant issue that came up in this discussion was the effects on Lake of the Woods water levels. There was some speculation that water level concerns on Lake of the Woods may be somewhat ameliorated by the proposed steering committee alternatives. The possibility of hydropower losses at IF-FF being made up at Kenora was also discussed but no conclusions were reached and the issue needs further investigation.

4. Modification of SC Consensus Rule Bands/Protocols for Periodic Lake Rejuvenation: Based on Rick Carson's analysis and further discussion of the needs of various interests, the steering committee further modified the previously drafted rule bands for both lakes. (See attachment from Paul Radomski.) It was agreed to lower the Namakan SC Consensus #1 rule band bottom line to 1112.0 ft. in the spring. This would be higher than the current bottom but still allow for

some flexibility regarding maximizing the annual fluctuation for rejuvenation purposes. This alteration could be changed based on the outcome of the Loon River survey.

For Rainy Lake, the steering committee approved modifications to the SC Consensus Rule Band to broaden the minimum of the band in early spring and to broaden the width of the band in April and May to accommodate 80 percent of the historic flows.

The steering committee then drafted protocols or procedures to provide for periodic lake rejuvenation following the recommendations of the Cohen, et al. study. The provisions are as follows:

a) Maximize the drawdown from June 1 - August 31 within the proposed rule bands to maximize the value to fish and wildlife resources.
b) If natural climatic conditions are causing water levels to be low during the winter, every one in five years the level should be managed to track the bottom of the rule band in winter.

Paul Radomski agreed to refine the language of these protocols consistent with the steering committee's intent.

5. Detailed Evaluation of Alternatives: The steering committee addressed the need for evaluation of the SC Consensus Rule Bands based on the criteria identified by the committee at the January meeting. Larry Kallemeyn agreed to do the evaluation for the criteria in the NPS water level management study. He also agreed to evaluate the potential for ice damage to docks. Bill Darby will ask Water Resources Canada to evaluate the downstream and upstream impacts. Boise Cascade will assist with this and also evaluate the feasibility of staying within the rule bands in operating the dams. Bill Darby will request Ontario Ministry of Environment to evaluate the water quality impacts, particularly with respect to mercury levels, oxygen depletion, and effluent dilution.

6. Public Consultation Process: The steering committee agreed to conduct a proactive public consultation process by requesting meetings with key interest groups for the purpose of presenting the steering committee's work and obtaining comments. The members want the public consultation presentations to stress the flexibility of the process, to focus on listening and being open to suggestions, to cover both sides of the border, to point out the current water level management regime and its limitations. The committee brainstormed a list of possible groups that should be contacted during this process:

Ft. Frances Town Council
Joint Ft. Frances/Int. Falls Council meeting
Koochiching County, Minnesota
First Nation Band Councils
Rainy Lake Sport Fishing Club
Fort Frances Sportsmen's Club
Ducks Unlimited
CCVNP (full committee)
Border Lakes Association
Crane Lake Commercial Club
Kabetogama Resort Association
Ash River-Namakan Lake Association

Tourist operators in Canada
I. Falls Chamber of Commerce
Stewardship Alliance
General shoreline owners

It is anticipated that joint meetings could be held with several of these groups, and others, at one time. The committee tentatively planned to begin the public consultation process in late July and continue through August. It is expected that a 30-day review and comment period could coincide with the meetings with the various groups. At the next meeting the steering committee will design a format for the presentations and the consultation process.

7. Next Meeting: The next meeting of the steering committee was scheduled for June 17 in Ft. Frances. The meeting will run from 2-9 p.m.

8. Public Input Time: There were no members of the public present who wished to address the steering committee.

9. Assignments:

Paul Radomski:
- Revise rule curve bands
- Rewrite lake rejuvenation protocols
- Arrange for MDNR participation in Loon River survey

Bill Darby:
- Loon River Survey
- Request evaluation of SC Consensus rule bands from Ontario Ministry of Environment and Water Resources Canada

Larry Kallemeyn:
- Collect photos of familiar landmarks at key water levels
- Evaluate SC Consensus Rule Bands with respect to NPS criteria and ice damage criteria

Geoff Gillon:
- Collect photos of key landmarks at key water levels

Mike Romslo:
- Request Acres International to evaluate dam operation feasibility of SC Consensus Rule Bands

All members:
- Consider and prepare public consultation process ideas for next meeting

MEETING ATTENDANCE

Members

Bill Darby - OMNR
Geoff Gillon - Citizen (Canada)
Paul Radomski - MDNR
Joe Boyle - Citizen (US)
Mike Romslo - Boise Cascade
Dennis McDougall - Citizen (Canada)

Alternates

Larry Kallemeyn - NPS

Observers

Rick Carson - Acres International
Amy Loiselle - MDNR

RAINY LAKE/NAMAKAN CHAIN WATER LEVEL MANAGEMENT

INTERNATIONAL STEERING COMMITTEE

MEETING SUMMARY -- MAY 4, 1992

At Lac La Croix

1. Preliminaries:
Committee members and alternates were introduced to Chief Jourdain and other Lac La Croix residents. A brief overview of the Steering Committee's purpose, organization and progress was presented.

2. Concerns of the Lac La Croix First Nation:
Time was provided for Lac La Croix First Nation members to express their concerns regarding water levels on the Namakan Reservoir. These concerns are summarized as follows:

   a. The Lac La Croix First Nation was not consulted when the previous rule curves were adopted or changed in 1949, 1957 and 1970.

   b. The major concern with the present situation is that safe navigation on the Loon River be assured, especially in the spring (May/early June).

   c. A water level of 1118 feet on Namakan from ice-out to freeze-up is considered a reasonable objective.

   d. The Loon River is of great importance in providing access for groceries, medical help, supplies/materials, fuel.

   e. Water levels are important to the Lac La Croix economy which is largely based on tourism.

   f. The community now has no heliport to provide emergency access.

   g. The existing rule curve is not suitable for the Lac La Croix Band or for Crane Lake. The Band will be submitting a formal proposal.

   h. When the present Namakan rule curve was adopted in 1970, about a month of the (spring) navigation season on the Loon River was lost. The 1957 curve better reflects the needs of the Lac La Croix community.

4. Discussion of the Fisheries Studies for Rainy and Namakan Reservoirs:
Bill Darby and Paul Radomski discussed the studies that have been done to examine ways of improving the fisheries on Rainy and Namakan Lakes.

5. Presentation of the Various Rule Curves
   -- Fish and Wildlife curve
   -- Hydropower curve

-- Wild rice curve (The Lac La Croix band does not harvest rice on Namakan)
-- Navigation curve
-- Flood control curve

5. Discussion of Needs Regarding the Loon River:
   a. We need to know how far up the Loon River there are impacts associated with changes in the Namakan Lake water levels.
   b. We need to know what water levels are needed in the fall, and if this could be compromised in the interest of improving the fishery.
   c. We need to know the reservoir elevation on the date when the first boat can go safely through the rapids. Chief Jourdain will have his people observe this and then he will call Bill Darby, who will determine the Namakan elevation as of that date.
   d. We need to determine if dredging would be a feasible means of improving navigability on the Loon River under low water conditions.
   e. We need to determine what a level of 1116 feet on Namakan (Kettle Falls gage) does to rapid #56.
   f. We need to determine the feasibility of improving Dawson's portage to improve access to Lac La Croix.
   g. In summary, the Lac La Croix Band needs a water level on Namakan Reservoir that allows safe navigation up the Loon River through the navigation season. They would not be concerned with higher water levels on Namakan.

MEETING ATTENDANCE

Members
Bill Darby
Ben Clary
Joe Boyle
Geoff Gillon
Mike Romslo
Dennis McDougall
Paul Radomski

Alternates
Allan Kielczewski
Brian Jackson
Ken Wald

Lac La Croix First Nation
Leon Jourdain
Edward Atatise
John Boshly Jr.
Wesley Ottertail
Robert Atatise Jr.

RAINY LAKE / NAMAKAN CHAIN WATER LEVEL MANAGEMENT

INTERNATIONAL STEERING COMMITTEE

MEETING SUMMARY - APRIL 15, 1992

1. Preliminaries:
The meeting agenda and the summary of the previous meeting were approved.

2. Correspondence:
Items of correspondence were noted as follows:
   a. A letter from Richard Mollin (BLA) requesting status of the steering committee's response to their submittal of comments from Dick Sternberg on the Cohen, et al. report. (The letter from co-chairs to Mr. Mollin dated April _, 1992 responds to this request.)
   b. A copy of a letter from Bill Darby to John Lunny recognizing that he will resume participation on the steering committee.

3. Analysis of Draft SC Consensus Rule Bands:
Hydrologic analysis of draft rule bands by Boise Cascade (Acres International) and National Park Service are not completed. Paul Radomski and Bill Darby presented the results of their analyses of the SC alternatives. Both noted improvements in several aspects compared with the existing rule bands, but both expressed concern that the rate of late summer and fall drawdown on Rainy is not great enough to benefit ciscoes and whitefish.

4. Revise Draft SC Consensus Rule Bands:
After discussion the committee decided to add modifications to the draft rule bands as follows:

   Rainy Lake:
   Add modification A: start steady drawdown from October 1 to SC Consensus #1 and #2 Dec. 31 levels.
   Add modification B: start steady drawdown from Sept. 1 to SC Consensus #1 and #2 Dec. 31 levels.

   Namakan Res.:
   Add Namakan #3: defined as the top of SC Consensus #1 and the bottom of SC Consensus #2 during the spring water level increase period. This alternative was suggested to address concerns about spring breakup ice damage to docks.

Several other items were agreed to regarding further analysis of the SC Consensus alternatives. Responsibilities for implementation in parentheses.

a. From now on, rule bands should be plotted at the same scale to permit comparison of relative fluctuations. (MDNR)
b. Acres International should supply committee with a computer disk copy or other documentation of its analysis and a list of assumptions underlying the model. (Boise Cascade)
c. At future meetings maps of the subject water bodies should be available to aid committee discussion. (National Park Service)
d. At future meetings data reflecting current water levels and precipitation should be provided to the committee members. (Boise Cascade)

e. Consult with U.S. National Weather Service to find out what modifications to the Duluth, MN weather station will have on current precipitation predictive capability and report on findings at next meeting. (National Park Service)

5. Define Protocols for Lake Level Rejuvenation Cycles:
Joe Boyle proposed a draft rejuvenation procedure which basically calls for allowing the dam operator to maximize the amplitude of the lake level fluctuation within the overall maximum and minimum of the current rule bands, when hydrologic conditions are favorable on a 3-6 year cycle and with adequate public notice. There was extensive discussion of whether or not there should be any reduction in the Rainy Lake level below the minimum of the existing rule band. The main point in favor of such a reduction is that it would maximize benefit to the walleye fishery. The main disadvantage of such a reduction is the potential adverse effect on private water supplies. There was no consensus on what the plan for rejuvenation should be. The co-chairs requested more time to consider rejuvenation alternatives and it was decided to take up the matter again at the May 20 meeting.

6. PUBLIC INPUT TIME:
John Bartlett (Rendezvous Yacht Club):
- concerns with Rainy Lake only; 2 yacht clubs: Rendezvous and Rainy Lake Yacht Club
- has reviewed SC Consensus #1 and #2 and opposes water level reduction below 1107 ft. before Sept. 1 because some existing dockages would be eliminated; some dockages at RYC cannot be used if water level is at bottom of current rule band
- boat access equipment at Rainy Lake Houseboats, which is used for sailboat launching, would not be useable if levels are below 1107
- Sorting Gap Marina at Ft. Frances would be unusable if water level is below 1106.5 because of increased current under the RR bridge; boats would need a tow to get upriver
- sailing season is currently from early to mid-May until second or third weekend in Sept.
- sailing as a sport is on the increase in the area
- potential difficulty getting to safe anchorages if water level is dropped; also difficulty using existing channels; approximately 1/2 of sailboats would be affected.

b. John Bartlett (personal comments):
- with late summer drawdown and shallow water, private docks would not be reachable in some areas
- winter water supplies could be threatened; Jackfish Bay area sensitive to this; combination of ice pack growth and water level drop caused problem for one well
- may be difficult to stay below top of rule curve if water level peaks in May because most precipitation comes in June and may be hard to get water level to start dropping then as proposed curve calls for
- concern about reduced hydropower at Boise
- thinks fishing is improving over the last 10 years; supports slot limits

c. William Dougherty, Jr. (Rainy Lake Houseboats, Stewardship Alliance):
- If water level on Namakan is to be raised by May, how would flows below dam through spawning areas be affected? would it be cut off?
- how will upstream precipitation events be anticipated in terms of operating Kettle Falls dam?
- sailboat access at Rainy Lake Houseboats is a problem in low water; houseboats can get in even at existing (today's) water levels; dredging is alternative to accommodate sailboats, but would it be done at government or private expense? what effects would dredging have on wetlands and northern pike spawning areas?
- wants to help fishery of the lakes
- summer drawdown good for beaches, but in low water grass grows on the sand and makes it less attractive to houseboaters; but grass provides good smallmouth bass fishing.

7. Discussion of Analysis of Alternatives and Design of Public Consultation Process:

The committee agreed that it would be necessary to have the results of the hydrologic and hydropower analyses by Acres Intl. and the U.S. Park Service before any further analysis is done on the draft SC rule bands. The following information is needed:

a. the hydrologic feasibility of running the Namakan curves into the Rainy curves
b. the potential of any of the curves or combinations to cause or avoid flooding
c. the effect on hydropower production.

It was also agreed that all SC alternatives should be analyzed, not just selected bands.

The committee also requested that Rick Carson be available at the May 20 meeting to assist with the discussion of hydrologic and hydropower impacts. It was further requested that the results of the Acres Intl. and NPS analyses be available for committee review by the May 4 meeting.

For the public consultation process, there was some preliminary discussion about how the work of the committee should be shown. One suggestion was to show the various interest rule bands from which the consensus rule bands were developed. Then show by the overlap method how the consensus bands were developed. This method may be used at the Lac La Croix meeting on May 4. This topic will be discussed further at the May 20 meeting with respect to the graphic or audio visual aids needed for the public consultation process.

8. Task Assignments:

A summary of agreed upon assignments for committee members:

Paul Radomski

a. Revise transparencies of draft SC rules bands to show new modifications and to use same vertical scale for both lakes.
b. Provide boat transportation to May 20 meeting at Oberholtzer Island.

Bill Darby

a. Provide air transport for committee members and selected alternates to Lac La Croix for May 4 meeting.

Ben Clary

a. Bring detailed maps of study area to all future committee meetings.

b. Investigate U.S. Weather Service predictive capability with changes to Duluth station and report at next meeting.

c. Provide back-up location for May 20 meeting at Black Bay visitor center; provide park service boats for transport to Oberholtzer Island, if needed.

Mike Romslo

a. Bring lake water level and precipitation data to each committee meeting.

b. Ask Acres International to provide copy of disk with results of hydrologic and hydropower analysis or other documentation of model analysis; also list of underlying assumptions of model.

9. Next Meeting Dates and Agendas:
The committee set May 4 at Lac La Croix and May 20 at Oberholtzer Island for the dates and locations of its next meetings. The agendas were also set and are included in the notice of these meetings.

MEETING ATTENDANCE

Members

Ben Clary	U.S. Federal (NPS)
Bill Darby	Canada Provincial (OMNR)
Paul Radomski	U.S. State (MDNR)
Mike Romslo	Boise Cascade
Joe Boyle	U.S. Citizen
Tim Watson	U.S. Citizen (CCVNP)
John Lunny	Canada Federal (Coast Guard)
Geoff Gillon	Canada Citizen
Dennis McDougall	Canada Citizen
Joe Boyle	U.S. Citizen

Alternates

Larry Kallemeyn	Voyageurs National Park
Ken Wald	Minnesota DNR

Observers

Jim Sanborn	Crane Lake
Amy Loiselle	Minnesota DNR
Jack Bartlett	Rendezvous Yacht Club
Bill Dougherty	Rainy Lake Houseboats

RAINY / NAMAKAN WATER LEVEL MANAGEMENT

INTERNATIONAL STEERING COMMITTEE

MEETING SUMMARY - MARCH 26, 1992

1. Introductions and Preliminaries:
The committee adopted a revised agenda for the meeting and modified and approved the summary of the February meeting.

2. Items of Interest / Correspondence:
   a. Don Buckhout circulated a letter from Milton Knoll, CCVNP Chair, indicating that Sherwood Anderson and Barb Luce had been replaced by Tim Watson and David Dill as member and alternate representing the U.S. Citizen (CCVNP) perspective. The committee agreed to 1) direct Don to send copies of the previous committee summaries to the new members; 2) direct Paul Radomski to set up a briefing for the new members, to include other U.S. members as appropriate, to inform Mssrs. Watson and Dill about the work of the committee; and 3) direct the co-chairs to send a letter of appreciation on behalf of the committee to Mr. Anderson and Ms. Luce.

   b. Bill Darby reported that John Lunny will probably be able to resume attendance at committee meetings after April 1. Bill will still send a letter requesting John's continuing participation as was decided at the February meeting.

   c. Bill Darby recommended that the steering committee actively coordinate with the Lac La Croix band native people to consider their concerns regarding water level changes. Bill reported on a conversation with Leon Jourdain, Chief of the band, regarding the 1116.5 ft. water level. After discussion of several alternatives and consultation with Lac La Croix people via telephone, it was decided to send the co-chairs to meet with band leaders within the next 10 days to listen to their concerns about water level changes and to explain how the steering committee is developing its recommendations. Based on consultations with the band members, the full steering committee will hold a public input meeting at Lac La Croix in early May.

   d. Archaeological Concerns: Ben Clary and Bill Darby reported on conversations with archaeologists about the archaeological impacts of water level changes. Ben said that the late summer storms cause most of the damage to archaeological sites. Bill said that archaeologist, Paddy Reid, would like to have an opportunity to address the committee at a future meeting.

   e. Paul Radomski announced that he will be transferring to a new position with the DNR in New Ulm beginning in mid-April. He will, nevertheless, continue to attend steering committee meetings and serve as co-chair, but with some limitation in his involvement.

   f. Bill Darby summarized the portion of the March 24 International Rainy Lake Board of Control (IRLBC) meeting that dealt with the work of the steering committee. Several committee members reported to the IRLBC

on the status, objectives, and schedule of the committee. Dale Kimmett of the IRLBC will respond to Bill's request for IJC guidance on what the format of the committee's final product should be. One possibility is that it should have a 5-page executive summary that would reference a technical supporting document and description of public consultation results.

3. Rick Carson (Acres International) Presentation:
At the request of Boise Cascade, Rick Carson, hydraulic engineering consultant to Boise presented information to the committee regarding: 1) computer models used to assist Boise in operation of dams and hydroelectric generators, 2) an assessment of improvements to a model for predicting system hydrology, and 3) the rule curves that optimize power generation for Boise. There was extensive discussion regarding additional analyses that would be helpful to the committee. It was finally decided that after the committee developed draft rule bands for both Rainy and Namakan they should be combined and evaluated for impacts on hydropower generation, flooding potential, (by Acres Intl.) and the other evaluation criteria by the committee and others **(see item 7 below).**

4. Public Input Time:
Steve Bauer (Rainy Lake Sportfishing Club) expressed the following concerns to the steering committee:

- RLSFC supports rule curve alternative T8 for Rainy Lake because it provides a more natural curve
- RLSFC supports the spawning bed projects in the lake
- Other projects that the RLSFC has accomplished or are planning include: Tilson Bay rearing pond; catch and release angling; fingerling release; Rat Root River logjam cleanout (proposed for 1992)

5. Response to BLA (Sternberg) Comments:
After discussion of the matter, the committee decided to have the co-chairs send a letter on behalf of the committee to the Border Lakes Association indicating appreciation for the input and that the committee will consider the comments in its evaluation of water level management alternatives. The letter will also indicate that the committee would be glad to meet with Border Lakes Association representatives for follow-up discussion, if they request such a meeting.

6. Development of Draft Steering Committee Rule Bands for Rainy Lake and revision of Namakan Lake Bands:
Using the transparency overlay technique, the committee drew draft rule bands for Rainy Lake (Rainy Steering Committee Consensus #1 and #2) and revised the bands developed for the Namakan Chain at the February meeting (Namakan SC Consensus #1 and #2). Paul Radomski agreed to make copies of these new alternatives and send them out to members for their further review.

7. Task Assignments:
A summary of agreed upon assignments for committee members:
Co-chairs-

a. Meet with Lac La Croix band members in early April
b. Send response letter to BLA regarding the Sternberg analysis of the Cohen et al. study
c. Send letter of appreciation to former CCVNP representatives

Paul Radomski-

a. Make copies of new draft rule bands; distribute to SC members
b. Arrange for meeting and brief new U.S. Citizen (CCVNP) member and alternate

Bill Darby-

a. Send request to John Lunny that he continue to participate in absentia on SC

Boise Cascade-

a. Evaluate the impacts on hydropower and potential flooding probability for the Namakan and Rainy SC Consensus and existing rule bands

MDNR, OMNR, NPS-

a. Evaluate the biological impacts of the Namakan and Rainy SC Consensus and existing rule bands

Don Buckhout-

a. Send copies of past steering committee meeting summaries to new CCVNP representatives.

8. Next Meeting- Date and Agenda:
The committee set April 15, 8:00-4:00, and International Falls as the date, time and location for the next meeting. The agenda items were also set and ordered with the public input time to begin at 12:30 p.m. to accommodate people who may wish to visit the committee during their lunch period.

RAINY LAKE / NAMAKAN CHAIN WATER LEVEL MANAGEMENT

INTERNATIONAL STEERING COMMITTEE

MEETING SUMMARY - FEBRUARY 22, 1992

1. Introductions and Preliminaries:
The Committee approved the agenda for the meeting and corrected and approved the summary of the January meeting.

2. Items of Interest / Correspondence:
   a. Daily Journal article that mentioned the Committee in a negative light was mentioned and referred to the co-chairs for possible further response.

   b. Bill Darby referred to correspondence from the Rendezvous Yacht Club regarding water level changes, relevant information from the Atikokan-Minaki Waterway study, and additional public comments to add to the Correspondence file.

   c. Bill Darby also submitted for Committee consideration a letter of resignation from John Lunny citing budgetary restrictions that prevent him from attending meetings. The Committee agreed to have the co-chairs send a letter to Lunny requesting that he remain on the Committee without attendance but continue to be involved in review and comment on committee matters through the mail. Furthermore, it was agreed that the committee will support any requests for funding John will submit to Canada to attend public meetings or open houses sponsored by the committee.

   d. Border Lakes Association / Dick Sternberg response to Cohen et al. study was acknowledged as having been received by Committee members. The Committee discussed several options for response. It was finally agreed that Committee members would do further analysis and review of the matter prior to the next meeting. The Committee will decide at the next meeting how best to use the information related to this study. Options listed for possible follow-up include reviewing Dr. Cohen's response to Mr. Sternberg's comments, inviting a 3rd party review of the relevant portions of the study, and inviting Cohen and Sternberg to come to a future Committee meeting for further discussion.

3. Presentation of Various Interest Rule Bands:
Committee members who were assigned to develop rule bands that maximized certain values presented those bands to the Committee. These included bands for 1) fish and wildlife, 2) navigation, 3) flood control, 4) avoiding property damage, and 5) wild rice. Rule bands for hydropower impacts will be developed by Boise Cascade's consultant and rule bands for swimming beaches could not be developed.

4. Public Input Time:
   a. Dave Kepler (Ash River Trail) addressed the Committee and referred to his recent letter to the Committee. His interests were listed as: early spring water levels are currently inadequate; wide fluctuation of water levels on the Namakan Chain is a concern; needs water above 1116.5 ft. between May 1 and October 1 in order to operate his business.

b. **Tom Schlotec** (Lac La Croix) addressed the Committee and listed the following interests: present rule curve makes Loon River mechanical portages inoperable; Loon River is crucial for access to Lac La Croix; he had requested representation on the Committee; impacts to Lac La Croix were not included in Boise Cascade EAW and ignored by the Rainy Lake Board of Control and IJC; he would like to have Namakan Chain water level above 1116.0 ft. by May 1; the present rule curve is okay in the fall; the water level in summer could be at least one foot lower; and dredging of the Loon River wouldn't improve navigation.

c. **Rick Mollin** (Border Lakes Assn.) referred to the Sternberg response to the Cohen et al. study submitted by the BLA. He agreed to coordinate a meeting between Mr. Sternberg and certain members of the Steering Committee as needed to discuss the matter further.

5. Development of Namakan Lake Alternative Rule Bands:
Using an overlay method the Committee developed a tentative rule band for Namakan Lake that accommodated several of the interests presented in the individual interest rule bands. Paul Radomski agreed to make copies of the new alternative and send it out to Committee members for further analysis and consultation. Members were encouraged to discuss this alternative with their constituents and bring any comments or suggested revisions with them to the next Committee meeting. It was also agreed that the Committee would use the same process to develop a rule band for Rainy Lake at the March meeting.

6. Next Meeting Date and Agenda:
The agenda for the next meeting will include development of a tentative rule band for Rainy Lake and review of the Namakan alternative. Also the Boise Cascade consultant, Acres Co., will be present to evaluate the hydrologic feasibility and determine the hydropower impacts of the various alternatives. The Committee will decide how to use the information sent by BLA in response to the Cohen et al. study.

The meeting will be in Fort Frances and **the originally selected date of March 17 was changed to March 26 at the very end of the meeting.**

RAINY/NAMAKAN WATER LEVEL MANAGEMENT

INTERNATIONAL STEERING COMMITTEE

January 16, 1992 - MEETING SUMMARY

1. Introductions and Preliminaries:
The committee agreed to continue to keep audio recordings of the meetings. The committee also approved the agenda and the summary of the November meeting as written.

2. Correspondence and Items of Interest:
Joe Boyle submitted a comment letter from the Rainy Lake Sportfishing Club for inclusion in the correspondence folder. Bill Darby summarized responses from citizens to latest information brochure which he will submit for folder. Bill also mentioned two publications that contain information about environmental effects of hydropower development and water level management on the Kaministiquia River in Ontario.

3. Fisheries Management Presentation:
Ontario and Minnesota fisheries managers presented general information about the analysis of the current status of the fisheries in Rainy and the Namakan system. They outlined management efforts to reverse the decline of the walleye resource. Methods generally include regulating harvest, enhancing habitat, and controlling predators, and stocking fish.

4. Brainstorm Water Level Management Options:
There was general discussion of how water level management options should be prepared by the steering committee. It was finally agreed that the committee would pursue the development of one set of rule bands as the steering committee option. This option could be evaluated in comparison with the status quo (no change) option and two other widely recognized options. It was further agreed that the steering committee rule bands would be developed through a process of first identifying several rule bands which each maximize the benefits to certain selected interests. The various rule bands would be plotted on a standard overhead transparency grid and then overlaid with each other to identify points of commonalty and divergence. It was hoped that this method would facilitate seeking consensus on a final committee-defined option.

The committee went on to define which interests should have rule bands plotted and agreed on the following list, including the persons who will be responsible for plotting the bands and presenting them at the next meeting:

a. Fish and wildlife (traditional aquatic ecosystem); Radomski, Darby, Kallemeyn
b. Navigation (sailboats, houseboats, motorboats, dock access, snowmobiles, Ash, Loon, and Seine River access); Rainy Lake - Lunny, Namakan - Anderson
c. Hydropower; Romslo
d. Flood Control (archaeological values, shoreland erosion); Clary
e. Property Damage (boathouses, docks, retaining walls, water supply and heat pump lines); Rainy - Gillon, Namakan - Anderson
f. Swimming Beaches; Darby & Radomski
g. Wild Rice; Darby

5. Developing Evaluation Criteria:
The committee agreed that an evaluation of rule band alternatives should be based on the following criteria:

1. National Park Service Water Level Study criteria:
   a. Navigation
   b. Flood Control
   c. Boat Docks
   d. Hydropower
   e. Biology
   f. Public Beaches
   g. Archaeology Sites

2. Domestic Water Lines
3. Wild Rice Production
4. Property Damage from ice and waves
5. Downstream Impacts (Rainy River, Lake of the Woods, Squirrel Falls spawning)
6. Upstream Impacts (Lac La Croix, Loon River)
7. Water Quality (including downstream)
8. Dam Operation Feasibility
9. Hydrology

6. Public Input Time:
There were no members of the public present who wished to address comments or questions to the committee.

7. Press Release:
Paul Radomski received comments on the wording of a draft press release designed to serve as a follow-up notice to the public regarding the status of the committee's work and summary of the results of the response to the public information brochures distributed by the committee. Paul agreed to fax a copy of the revised draft to Buckhout for inclusion in the meeting summary and final review by the committee prior to release to the newspapers.

8. Assignments:
Paul Radomski agreed to develop transparency grids with existing rule band on them and to send those to people who are to prepare special interest rule bands for the next meeting.

9. Next Meeting:
Next meeting will be on Saturday, February 22 at Rainy River Community College in International Falls. The meeting will start at 8:30 and end at 3:00 p.m.

RAINY LAKE / NAMAKAN CHAIN
INTERNATIONAL WATER LEVEL MANAGEMENT
STEERING COMMITTEE

Meeting Decision Summary

November 26, 1991

(Note: The Committee gave permission to Geoff Gillon and Vic Alberts to videotape portions of the meeting for public information purposes.)

1. Revisions to Summary of October Meeting Decisions
Several corrections were noted to the October 23rd meeting summary. Also, Russ Summer submitted a revision of the summary of the Jim McQuarrie presentation (item 2 in the meeting summary). This revision was altered further by the committee. All agreed upon changes have been incorporated in the attached approved meeting summary.

2. Discussion of Boise Cascade Position Paper
Russ Summer presented a paper outlining Boise Cascade's position on several matters before the steering committee. After some discussion about the implications of the paper, it was agreed to accept the paper as the opinion of Boise Cascade and the concerns expressed would be factored into the evaluation of water level management alternatives at the appropriate time.

3. Presentations on Review of Related Documents and Studies
a. Lake of the Woods Regulation Guide - Dennis McDougall presented summary. No actions or decisions.

b. Rainy River Water Quality Study - Russ Summer presented summary. No actions or decisions.

c. VNP Study: Alternatives for Reducing the Impacts of Regulated Lake Levels on the Aquatic Ecosystem - Larry Kallemeyn presented summary. In addition to an extensive summary of the analysis of the several water level fluctuation alternatives, two factors not evaluated were brought up during discussion and agreed to be worthy of consideration--impacts on flood-prone on-site septic systems and impacts on lakewater intake lines.

4. Public Input

a. Rick Socholotuk, safety director of the Sunset Country Snowmobile Club, expressed the following interests and concerns of his organization:
- future integrity of trails; stability
- trail maintenance costs / investment
- effects on trails from water level changes
- Northwest Trails Study show Rainy Lake and Lake of the Woods as entry points
- recreation benefits / value in dollars { vs. his personal comment of the costs to lakeshore dock owners or Boise Cascade }
- **safety for snowmobilers**
- it seems to be okay the last two years, don't change it
- **predictability is important**

- don't make changes on a whim; need at least 4 mos. warning, need to know by August.

b. Vic Alberts, Fort Frances Sportsman's Club, expressed concerns about the effects of water level fluctuations on wild rice and made the following points:
- loss of rice harvest to native people
- heavy or increased drawdown in May adversely affects rice; stable water level in May is good for rice; gradual increase is okay
- stable water levels are better for rice.

c. Jim Sanborn, Border Lakes Association, expressed the following concerns about water level changes:
- new brochure doesn't show bands, only lines; need bands to be more understandable
- not sure about validity of Cohen fish study
- need for better control (predictability) at dams if more fluctuations are proposed
- most people would like higher levels in spring, gradual reduction in fall, level in summer
- access to Lac La Croix (Loon R.) would be problem with Alt. L8 in the fall; mechanical portage not an option if level is below 1116'

5. Status of Public Information Brochure:
Paul Radomski reported that the second public information brochure is at the printer and will be mailed out the week of December 2nd.

6. Next Steps

a. Public Comments and responses were discussed, especially how feedback to people as to how comments are being used. It was decided that the co-chairs would draft a news release for consideration at the next meeting indicating the status of the Steering Committee, summarizing the comments received, and giving a projection as to the direction the committee is taking.

b. The Steering Committee also brainstormed a list of possible topics and formed an agenda for the next meeting. One possible topic not included was a presentation by Rick Walden.

c. For the discussion of the evaluation criteria inventory it was decided that members should prepare their own list of evaluation criteria prior to the next meeting. The matrix criteria from page 55 of the VNP water levels study could be a starting point for this discussion.

d. Membership Changes: Allan Kielczewski requested that the Steering Committee allow him to switch places with Geoff Gillon, so that Geoff will be the member and Allan will be the alternate representing Canadian citizens. It was approved by the Committee. It was also announced that Mike Romslo would take Russ Summer's place as Russ will be in Arizona for several months.

e. It was agreed that the next meeting will be on January 16, 1992 in Fort Frances from 2 - 9 p.m.

RAINY LAKE / NAMAKAN CHAIN INTERNATIONAL WATER LEVEL MANAGEMENT STEERING COMMITTEE

MEETING SUMMARY - October 23, 1991

1. Preliminaries: After introductions the agenda was approved with the addition of Review of Status of Steering Committee co-chair activities to Item 4 and inclusion of Canadian citizen representation changes in Item 5. The summary of the August 15 meeting was approved as written.

2. Presentation on Boise Cascade Hydropower Operations: At the invitation of the Steering Committee, Jim McQuarrie and Mike Romslo were given the privilege of the floor to present information on how Boise Cascade operates the two dams to generate hydropower and manipulate water levels. Mr. McQuarrie outlined several of the parameters and assumptions which guide the operation of the system. He presented a copy of the current year's hydrograph and discharge rates for both dams.

   Mr. McQuarrie responded to questions as follows: 1) it is most beneficial to Boise Cascade to generate hydropower in winter, 2) the best annual water level cycle for hydropower generation is to maximize winter drawdown, 3) it would be better to plan a "5-year" fluctuation for the late winter/spring of the year, i.e. April, rather than the fall as winter/early spring conditions are more stable, and 4) Boise Cascade thinks that the existing rule curves are very good at balancing overall interests. He restated two main concerns which, in his opinion, are not being addressed in the discussion of water level changes: 1) the effects of overfishing vs. lake level fluctuations on fish populations, 2) potential liability to Boise Cascade from any water-level related damages. He also restated the company's position that power generation is a significant factor in the economics of the two mills.

3. Review of Correspondence:
   a. Copies of FERC license distributed to members and will be added to Supporting Documents folder.
   b. Written comments and transcribed oral comments received in response to public information efforts will be forwarded to Don Buckhout for inclusion in the Correspondence folder. This includes responses from Canadian MNR Advisory Committee survey. Other correspondence related to the Steering Committee's function but not addressed to the Committee will be added to the Correspondence file also.
   c. Draft of letter to FERC supporting Boise's request for an extension of license compliance period was reviewed. It was decided to include a list of Steering Committee members in the 2nd paragraph and to have only the co-chairs sign it. It will also be added to the correspondence file.
   d. Co-chairs Darby and Radomski reviewed the status of public information efforts since the last meeting. Newspaper articles about the steering committee appeared in both newspapers in late August and early September, and the co-chairs discussed the steering committee on radio talk shows in September. Boise Cascade paid for the printing and distribution of the brochures in late August, for which the members expressed their appreciation. Another presentation will be made to the Int. Falls Chamber of Commerce on October 24. In general, the feedback to date has been very diverse--both supporting and opposing water level changes.

4. Citizen Representative Identification:
In response to direction from the Steering Committee at the August meeting U.S. citizens' groups met to discuss membership. Tom Worth and Paul Radomski reported that the meeting resulted in a recommendation that two U.S. citizen members be on the steering committee. Their criteria for membership will be that both are at-large members with broad representation and that one of them be a CCVNP member and the other be from any other affiliation. The Canadian citizens will also be represented by two people who will serve at-large with any organizational affiliation. The Steering Committee agreed to these recommendations and also stipulated that future replacements will be determined by the citizens according to the adopted criteria and that the Steering Committee may give direction regarding geographic representation if necessary.

Additions to the members and alternates list were noted as follows:

Sherwood Anderson - new member (U.S./CCVNP)
Dennis McDougall - new member (Canadian citizens)
Barb Luce - alt. to Sherwood Anderson
Geoff Gillon - alt. to Canadian citizen representatives
Randy Wepruk - alt. to Bill Darby (Canadian province)
Tom Worth - alt. to Joe Boyle (U.S. citizens)

5. Review of Draft Brochure on Rule Curve Alternatives

There was general discussion of the draft public information brochure prepared by a subcommittee of the Steering Committee. It was agreed that:

-Paul would check to make sure the BLC-88 and Citizens Council curves are still supported by those organizations;
-features of the existing rule bands will be added;
-a statement to the effect that the Steering Committee will not propose water level fluctuations that exceed IJC-established flood elevations;
-news releases will be synchronized with distribution of brochure to the public;
-the subcommittee and co-chairs could make final changes to the brochure and distribute it without further review by the Steering Committee.

6. Public Input Time:

No members of the public or other observers wished to address comments or questions to the Steering Committee during the public input time. It was agreed that in future meetings, members of the audience will be surveyed to determine how many wish to speak and on what topics. This information would be used to set a time limit for the public input time.

7. Next Steps/Next Meeting Agenda:

a. It was decided to continue the Compile Info. task in the Steering Committee's work plan flowchart by focusing on obtaining additional information on hydrology, water quality and other water level alternative analyses. For the next meeting John Lunny will contact Rick Walden to obtain copies of the Lake of the Woods Regulation Guide for the Steering Committee and Dennis McDougall will review and report on the Guide's contents; Larry Kallemeyn will report on the conclusions from the NPS Study on Water Level Changes; Russ

Summer will review and report on the Water Quality Study that was completed in connection with the environmental reports associated with the Boise expansion. Mr. Lunny will also explore the possibility of having Rick Walden attend the next Steering Committee meeting. (See attached letter on this issue.)

b. The co-chairs will summarize the responses received to the public information brochures and other public information methods and send copies of written and verbal comments to the facilitator for inclusion in the Correspondence file.

c. A future session of the Steering Committee, possibly the December meeting, will be devoted to brainstorming options for water level changes. But it was agreed that any option generation should be based on public input received.

d. It was agreed to hold the next meeting at a time when members of the general public could more readily attend, especially the public input portion of the meeting. Therefore, the steering committee agreed to run the meeting from 2:00 p.m. to 9:00 p.m. with public input time starting at 6:30 p.m.

INTERNATIONAL RAINY/NAMAKAN CHAIN WATER LEVEL STEERING COMMITTEE

MEETING SUMMARY - August 15, 1991

1. Membership Changes: Facilitator distributed copies of Milton Knoll's letter requesting committee action on the issue of who the U.S. citizens representative to the committee should be. The committee agreed that the relevant citizens groups and individuals should meet to decide who they want to represent their interests on the committee. Radomski acknowledged that the VNP Citizens Council was originally identified as the representative of the U.S. citizens, but that citizens should determine whether that arrangement should continue, not the committee. Radomski and Clary indicated that they would accept any representative as long as the Citizens Council input is considered in that decision. Boyle was requested by the committee to arrange a meeting of relevant groups to address this issue and report the group's decision to the committee in September. Committee co-chairs were encouraged to attend the citizens groups meeting.

   Another membership change is that Ken Wald will be the DNR alternate instead of Dave Friedl.

2. Correspondence review: Facilitator distributed letters from Ash River Trail group and Ash River - Namakan Lake Assn. requesting notification of committee meetings and stating concerns regarding water level issues. Committee agreed to add these organizations to the committee mailing list. The committee requested that the facilitator keep a binder for correspondence and that correspondence review be a standard agenda item for each meeting.

3. Review summary of July 15 meeting: The committee agreed to add language suggested by Summer and Darby to summary item 3 regarding the phone conversation with Don Parsons. (See July 15 Final Meeting Summary for additional sentences.) The summary was approved with these additions.

4. Boise Cascade FERC requirements: Richard Baxendale, legal counsel from Boise Cascade, addressed the committee on the FERC license conditions for the operation of the hydroelectric dam at International Falls/Fort Frances. Mr. Baxendale highlighted three articles of the license which mandate operation within the IJC-established rule curve; development of a lake level management plan in consultation with relevant agencies that insures protection and enhancement of water quality, fish and wildlife, and recreation; and maintenance of water level at the high end of the rule curve band for 15 days after spring ice-out.

   Mr. Baxendale indicated that Boise prefers to operate with the existing rule curve because it has worked well for them. However, he indicated that the company is prepared to make water level management changes, including operation under altered rule curves, if the changes are properly balanced among all interests, including their own. He indicated that if water level management changes are at all significant, it is likely that FERC would require an EIS to evaluate the impacts of those changes.

   Mr. Baxendale agreed to provide copies of the FERC license and environmental assessment for distribution to the committee. Summer also agreed to have Jim McQuarrie and Mike Romslo attend the next steering committee meeting to

address dam operating and hydropower generation procedures. Darby requested that Mr. McQuarrie be prepared to speak on the legislative and regulatory oversight of Boise Canada.

6. Review of committee process flowchart: Committee members discussed the sequence of tasks on the process flowchart. After some discussion of whether or not the committee should develop a consensus proposal for public review and comment or just present options for the public to review as the flowchart indicates, it was decided that the process should remain as defined. The justification was that the public should be consulted rather than given the impression that the committee has made a final decision.

   It was also agreed to attach dates to the tasks on the flowchart. (See attached copy of revised flowchart.)

7. Review of draft public information brochure: The subcommittee members who drafted the brochure indicated that its purpose is to inform the public about the steering committee, about rule curve bands, and about relevant fisheries and NPS studies which have been conducted. The audience is primarily shoreland property owners. The committee discussed brochure contents and reordering the sequence of information presented.

   A general mailing list, as opposed to the committee mailing list, will be developed by Radomski and Darby for the mailing which is scheduled for no later than August 26. Mike Romslo indicated that BC may be willing to fund mailing expenses depending on the cost. The committee also discussed accompanying radio and newspaper publicity for the brochure.

8. Decision on committee writer: Several alternatives were considered and discussed, including contracting for a writer, having co-chairs serve as writers, and others. It was decided that the original drafting would be done by various members or other persons related to the committee, depending on the topic. The facilitator will be responsible for compiling and editing the final product for committee review and approval.

9. Committee tasks and assignments:

   Boyle - will arrange a meeting of U.S. citizens' groups to resolve committee member issue by next steering committee meeting.

   Summer - will arrange to have Jim McQuarrie and Mike Romslo from BC make presentation on hydropower operations and Canadian legislative authority for power generation at next steering committee meeting.

   Darby, Radomski, Clary, Kallemeyn - will develop brochure describing previously proposed rule curve changes and have draft available for committee review at next meeting.

   Radomski, Darby - will revise, duplicate and mail information brochure and arrange for accompanying radio and newspaper publicity.

10. Next meeting date and agenda: The committee agreed to September 12 and Fort Frances as the date and location for the next meeting. The agenda items agreed to are as follows:

Review correspondence
Review and approve previous meeting summary
Report on U.S. citizen membership
BC hydropower operation presentation
Observer input time (at 1:00 pm)
Review rule curve information brochure
Identify tasks and next steps
Set date, location and agenda for next meeting.

11. Meeting Attendance:

Members:
Ben Clary - Voyageurs National Park
Allan Kielczewski - Canadian citizens
Joe Boyle - U.S. citizens
Paul Radomski - Minnesota DNR
Bill Darby - Ontario MNR
Russ Summer - Boise Cascade
John Lunny - Canadian Coast Guard

Alternates:
Mike Romslo - Boise Cascade
Sherwood Anderson - U.S. citizens

Observers:
Larry Kallemeyn - Voyageurs National Park
Tom Worth - Rainy Lake Sportsmen

Guests:
Richard Baxendale - Boise Cascade

RAINY LAKE/NAMAKAN CHAIN WATER LEVEL MANAGEMENT

STEERING COMMITTEE

SUMMARY OF JULY 19, 1991 MEETING

1. Committee Membership

Several membership changes were announced to the committee. Paul Radomski (DNR) is now the Minnesota representative and Dave Friedl (DNR) is his alternate. Sherwood Anderson (VNP Citizens Council) is the alternate to Joe Boyle representing U.S. public groups. John Lunny (Canadian Coast Guard) is the Canadian federal representative. Mike Romslo is the alternate for Russ Summer representing Boise Cascade.

2. Mailing List and Distribution of Committee Materials

Don Buckhout distributed letter from Richard Mollin and response regarding distribution of committee meeting summaries to non-members. After some discussion, the committee decided to have an open mailing list, i.e. anyone who wishes can be on it, and to distribute materials to the entire list. Draft meeting summaries shall be so stamped prior to distribution.

3. Conference Call with Don Parsons

From 9:30 until approximately 11:00 a.m. the committee participated in a conference call with Don Parsons and Jim Chandler of the International Joint Commission staff in Washington D.C. Mssrs. Parsons and Chandler explained general aspects of the IJC approval process and answered committee members' questions. Mr. Parsons emphasized that in deciding any request for change in water level management, the primary concern of the IJC will be: what are the facts that bear on the issue? The Commission will have to wade through opinion, subjective comment and factual information in coming to a conclusion. In addition, it is necessary for the IJC to consider all uses of the watersheds, both current and projected. The Commission may hold public hearing to insure adequate consultation occurs. Mr. Parsons promised to send information to the committee through Don Buckhout regarding the operating rules of the IJC and the consolidation order regarding Rainy Lake water level control. Mr. Parsons ended the conversation by encouraging the committee to have its final product in mind when defining the process it plans to follow.

4. Review of June 10 Meeting Summary

The summary of the June 10 meeting was approved as written.

5. Selection of Committee Co-chairmen

The committee agreed that Paul Radomski and Bill Darby should be designated as the committee co-chairs and as such will act as spokesmen for the committee, among other duties yet to be defined.

6. Follow-up Discussion of Conference Call with Parsons

The committee discussed its product as defined at the last meeting. It was agreed to modify the first product and to add a second and third item to the first. The committee product, as revised, includes the following three phases:

1) Define a process for developing a recommended water level management plan.

2) Recommend whether or not a proposal for a change in water level management should be made.

3) Develop a proposal for a water level management change, if required.

The committee decided to accept Russ Summer's offer and invite a member of Boise Cascade's legal staff to address the committee at its next meeting about Boise's obligations regarding FERC re-licensing.

There was also general discussion about whether the steering committee would be perceived as the proponent if it recommended a rule curve change and what obligations or liabilities that designation would have. It was assumed that this issue could be clarified with the Boise legal expert at the next meeting.

7. Definition of Committee Process

The committee began work on its phase one product by defining tasks and a process for accomplishing its overall objectives. The attached flowchart diagram depicts the process as defined by the committee.

8. Development of Public Information Brochure

Public representatives Allan Kielczewski and Sherwood Anderson expressed a need to have some form of public information brochure to discuss the steering committee issues with members of the public. It was decided that this was an urgent matter because several of the relevant publics are seasonal residents and would be leaving the area at the end of August. It was agreed that a subcommittee made up of Darby, Radomski, Clary and Kallemeyn would meet and develop a public information brochure mock-up and have it available for review by the committee at the next meeting. The brochure should clearly explain the relative importance of water level fluctuations for the quality of fishery.

9. Date and Agenda for Next Meeting

The committee set August 15 as the date for the next meeting and the following as agenda items:

1) Review and approval of meeting summary

2) Presentation of information from Boise Cascade legal and engineering staff

3) Review and approval of draft public information brochure

4) Identify committee writer(s)

5) Determine next step assignments

10. Assignments

DNR, MNR, VNP to meet to develop brochure mock-up and submit to committee at next meeting.

Russ Summer will invite Boise legal and engineering experts to attend and make presentations at next committee meeting.

All Committee Members are requested to review VNP and Cohen et al. reports prior to next meeting.

RAINY LAKE/NAMAKAN CHAIN WATER LEVEL MANAGEMENT STEERING COMMITTEE

July 19, 1991 Meeting Attendance

*Bill Darby - Ontario MNR
*Russ Summer - Boise Cascade
*Joe Boyle - U.S. Public interests
*Allan Kielczewski - Canadian Public interests
*Ben Clary - Voyageurs National Park
*Dave Friedl - Minnesota DNR
*Sherwood Anderson
Ken Wald - Minnesota DNR
F.R. Bokorney
Tom Worth
Larry Kallemeyn - Voyageurs National Park

* Denotes Committee member or alternate

RAINY LAKE/NAMAKAN CHAIN WATER LEVEL STEERING COMMITTEE

SUMMARY OF JUNE 10, 1991 MEETING

1. Background and Expectations

After introductions, the meeting began with explanations by all present of their involvement in recent activities regarding Rainy/Namakan water level change discussions and their expectations for the steering committee. There was general agreement that any recommendations should be based on a consensus of the committee, but there was disagreement over the purpose of the committee.

2. Selection of Facilitator

Don Buckhout (DNR, Office of Planning) offered his services to the steering committee as a neutral facilitator to help run the committee meetings. It was decided to accept Don as facilitator on a trial basis.

3. Committee Product

The committee identified two potential final products:

1) develop a proposal for water level management to submit to the IJC; or,

2) define a process for developing a recommended water level management plan, which may or may not include rule curve change recommendations to the IJC.

After discussion the committee selected product option 2 as the overall objective for its efforts. The committee further defined, in general, essential elements of the product:

End result/product
Responsibilities
Time Frames
Procedures (both Canadian and U.S.) including environmental assessments

4. Membership

The committee identified a list of agencies and individuals who would comprise the membership of the committee:

Public (Canada): Allan Kielczewski
Public (U.S.): Joe Boyle
Canada (Province): Bill Darby - Ontario MNR
Canada (Federal): ?
U.S. (State): Ken Wald - Minnesota DNR
U.S. (Federal): Ben Clary - N.P.S.
Boise Cascade. Russ Summer

The committee agreed that new representatives can only be added by the consensus of the committee.

The committee also decided that other people are welcome to attend committee meetings as observers but may not address the committee unless a member recommends, and the committee agrees, that they be allowed to do so.

5. Scope

The committee identified both the geographic scope of its efforts and began to address the scope of issues it would address.

The geographic scope was defined as the area regulated by the International Rainy Lake Board of Control.

The committee began to list the scope of issues it would seek to address as follows:

Water level management on Rainy and Namakan Reservoirs
- analysis of system operation
- hydropower
- benefits and risks

Downstream impacts

Upstream impacts

Legal requirements

Public consultation, information and education

6. Additional Operating Groundrules

The committee also agreed on operating groundrules in the following areas:

Media: 1) any news releases about the committee will be issued through the committee chair(s) after committee review; 2) committee members agree to circulate for review any draft articles or other publications about the committee prior to release.

Working Relationships: the members agree to conduct a good faith effort to achieve the committee objectives through an open, creative process.

Public Involvement: 1) the chair(s) will allow time for public comment on the agenda for each meeting; 2) the committee will sponsor open public forums if needed; 3) observers are welcome to attend committee meetings but may only address the committee if a committee member recommends that they do so and if the committee concurs.

7. Agenda for Next Meeting

The committee agreed that the agenda for the next meeting should include the following elements:

1) decide on chairmanship;

2) receive input from Rainy Lake Board of Control representatives on legal and process requirements for changes in water level management;

3) discuss schedule for completing committee work.

The committee decided to meet for all-day sessions and to alternate meeting locations across the international border.

8. Assignments

The following assignments were identified at the end of the meeting:

DNR: Explore representation questions.
Contact Rainy Lake Bd. of Control re: obtaining a speaker for the next mtg.

MNR: Contact senior officials re: bilateral process and co-chair feasibility.
Contact Rainy Lake Bd. of Control re: obtaining a speaker for the next mtg.

Facilitator:
Write up meeting minutes and send them out.
Write agenda for next meeting.

APPENDIX E

ANALYSIS OF IMPACTS TO TOURISM ASSOCIATED WITH EXISTING IJC RULE CURVE

ECONOMIC LOSSES DUE TO LOW WATER ASSOCIATED WITH THE PRESENT RULE CURVES OF THE NAMAKAN BASIN

The figures that follow are based on losses including the three resort areas on the Namakan Basin, Crane Lake, Ash River Trail and Kabetogama.

The losses are based on a 40% business reduction during the first three weeks of the fishing season on an average year.

The total number of rentals per week available for the three areas are as follows:

Cottages	325
Lodge rooms (including motel units)	65
Campsites (private & Woodenfrog) Excluding Park sites	287

A further breakdown of rentals available by area is as follows:

1.	Cottages:	Kabetogama	211
		Crane Lake	70
		Ash River Trail	44
2.	Campsites:	Kabetogama	137
		Crane Lake	25
		Ash River Trail	125
3.	Lodge rooms: including motel units	Kabetogama	25
		Crane Lake	40
		Ash River Trail	0
4.	Houseboats:	Kabetogama	0
		Ash River Trail	20
		Crane Lake	20

Cottage Rental Income Losses:

An average cottage price of $400/wk was used.

1. A 40% reduction per week for three weeks
   130 lost rentals X $400 = $52,000
   3 week totals = $156,000

2. A 40% reduction per week of campsite rentals
   An average rental of $100/wk for three weeks

   114 lost rentals X $100 = $11,400
   3 week totals = $34,200

3. A 40% reduction per week of Lodge Room Rentals
   An average rental of $250/week

   26 lost rentals of = $6,500/week
   3 week totals = $19,500

4. A 40% reduction per week of Houseboat rentals
An average rental of $3,500/week

16 lost rentals of = $56,000/week
3 week totals = $168,000

Other Losses

1. Cottages Boat & motor Losses/wk
130 X $200 $26,000/Wk 3 weeks $78,000

2. Campsites
Boat & Motor Losses
114 X $200 $22,800/Wk 3 weeks $68,400

3. Houseboats Gas, Bait Boat & Motor
3 weeks $30,000

Miscellaneous-Gas, food, liquor, clothes, groceries, Bait and Tackle

$75,000/week 3 weeks $225,000

The total of the above	$779,100
Sales Tax lost	22,327
Lodging Tax lost	10,305
Overall total of	$811,732

Persons compiling the above information:

Sherwood Anderson Larry Kec Tim Watson	Kabetogama
Joe Ebel Dave Kepler Mark Hraban	Ash River Trail
Jim Sanborn Mr. Anderson	Crane Lake

APPENDIX F

HYDROLOGIC ANALYSIS DATA

TABLE F - 1

RAINY LAKE
FREQUENCY OF DEVIATIONS GREATER THAN EMERGENCY LEVEL OF 1108.6 feet

YEAR	NUMBER OF DAYS												NUMBER OF MONTHS	% OF TIME
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
1957	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	14	0	0	0	0	0	0	1	3.8
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	29	0	0	0	0	0	1	7.9
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	13	0	0	0	0	0	0	1	3.6
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: Simulated Operation in Accordance With Existing IJC Rule Curve

Source: Acres International, Ltd.

TABLE F - 2

RAINY LAKE
FREQUENCY OF DEVIATIONS GREATER THAN EMERGENCY LEVEL OF 1108.6 feet

YEAR	NUMBER OF DAYS												NUMBER OF MONTHS	% OF TIME
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
1957	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	3	0	0	0	0	0	0	0	1	0.8
1963	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	4	0	0	0	0	0	0	1	1.1
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	5	21	0	0	0	0	0	0	2	7.1
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	14	31	0	0	0	0	0	2	12.3
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	14	0	0	0	0	0	0	1	3.8
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	24	2	0	0	0	0	0	2	7.1
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: Simulated Operation in Accordance With Steering Committee Proposed Rule Curve

Source: Acres International, Ltd.

TABLE F - 3

RAINY LAKE
FREQUENCY OF DEVIATIONS GREATER THAN LEVEL OF 1108.1 feet

YEAR	NUMBER OF DAYS												NUMBER OF MONTHS	% OF TIME
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
1957	0	0	0	0	0	8	1	0	0	0	0	0	2	2.5
1958	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	16	3	3	3	0	0	0	4	6.8
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	7	25	0	0	0	0	0	0	2	8.8
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	17	31	6	0	0	0	0	3	14.8
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	19	2	0	0	4	0	0	3	6.8
1971	0	0	0	0	0	0	0	0	0	0	6	0	1	1.6
1972	0	0	0	0	0	0	3	0	0	0	0	0	1	0.8
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	24	4	0	0	0	0	0	2	7.7
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	8	16	0	0	2	6.6
1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	10	5	15	0	10	0	0	0	4	11
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	8	0	0	0	1	2.2
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	2	0	0	0	0	1	0.5

Note: Simulated Operation in Accordance With Existing IJC Rule Curve

Source: Acres International, Ltd.

TABLE F - 4

RAINY LAKE
FREQUENCY OF DEVIATIONS GREATER THAN LEVEL OF 1108.1 feet

YEAR	NUMBER OF DAYS												NUMBER OF MONTHS	% OF TIME
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
1957	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	14	14	0	0	0	0	0	0	2	7.7
1963	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	21	11	0	0	0	0	0	2	8.8
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	14	27	0	0	0	0	0	0	2	11.2
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	23	31	8	0	0	0	0	3	17
1969	0	0	0	0	0	11	0	0	0	0	0	0	1	3
1970	0	0	0	0	0	30	8	0	0	0	0	0	2	10.4
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	7	30	10	0	0	0	0	0	3	12.9
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	2	7	0	0	0	0	0	0	2	2.5
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	15	10	15	0	0	0	0	0	3	11
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: Simulated Operation in Accordance With Steering Committee Proposed Rule Curve

Source: Acres International, Ltd.

TABLE F - 5

NAMAKAN LAKE
FREQUENCY OF DEVIATIONS GREATER THAN EMERGENCY LEVEL OF 1119.1 feet

YEAR	NUMBER OF DAYS												NUMBER OF MONTHS	% OF TIME
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
1957	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	11	15	0	0	0	0	0	0	2	7.1
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	6	28	0	0	0	0	0	2	9.3
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	11	13	0	0	2	6.6
1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	3	0	0	0	0	1	0.8
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: Simulated Operation in Accordance With Existing IJC Rule Curve

Source: Acres International, Ltd.

TABLE F - 6

NAMAKAN LAKE
FREQUENCY OF DEVIATIONS GREATER THAN EMERGENCY LEVEL OF 1119.1 feet

YEAR	NUMBER OF DAYS												NUMBER OF MONTHS	% OF TIME
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
1957	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	7	0	0	0	0	0	0	1	1.9
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	14	16	0	0	0	0	0	0	2	8.2
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	14	29	0	0	0	0	0	2	11.8
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	14	0	0	0	0	0	0	1	3.8
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	2	0	0	0	0	0	0	1	0.5
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	4	9	0	0	2	3.6
1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: Simulated Operation in Accordance With Steering Committee Proposed Rule Curve

Source: Acres International, Ltd.

TABLE F - 7

NAMAKAN LAKE
FREQUENCY OF DEVIATIONS GREATER THAN LEVEL OF 1118.6 feet

YEAR	NUMBER OF DAYS												NUMBER OF MONTHS	% OF TIME
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
1957	0	0	0	0	0	4	0	0	0	0	0	0	1	1.1
1958	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0	4	0	0	0	1	1.1
1962	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	3	1	0	0	0	0	2	1.1
1964	0	0	0	0	0	7	0	2	1	0	0	0	3	2.7
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	15	21	0	2	0	0	0	0	3	10.4
1967	0	0	0	0	0	0	0	2	0	0	0	0	1	0.5
1968	0	0	0	0	0	12	31	2	0	0	0	0	3	12.3
1969	0	0	0	0	0	7	4	1	0	0	0	0	3	3.3
1970	0	0	0	0	0	15	3	0	0	0	0	0	2	4.9
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	7	0	0	0	0	0	1	1.9
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	7	0	6	0	0	0	0	2	3.6
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	23	24	0	0	2	12.9
1978	0	0	0	0	0	0	0	4	0	0	0	0	1	1.1
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	5	5	0	4	0	0	0	3	3.8
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	8	0	0	0	0	1	2.2
1988	0	0	0	0	0	0	0	17	21	0	0	0	2	10.4
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	2	0	0	0	1	0.5

Note: Simulated Operation in Accordance With Existing IJC Rule Curve

Source: Acres International, Ltd.

TABLE F - 8

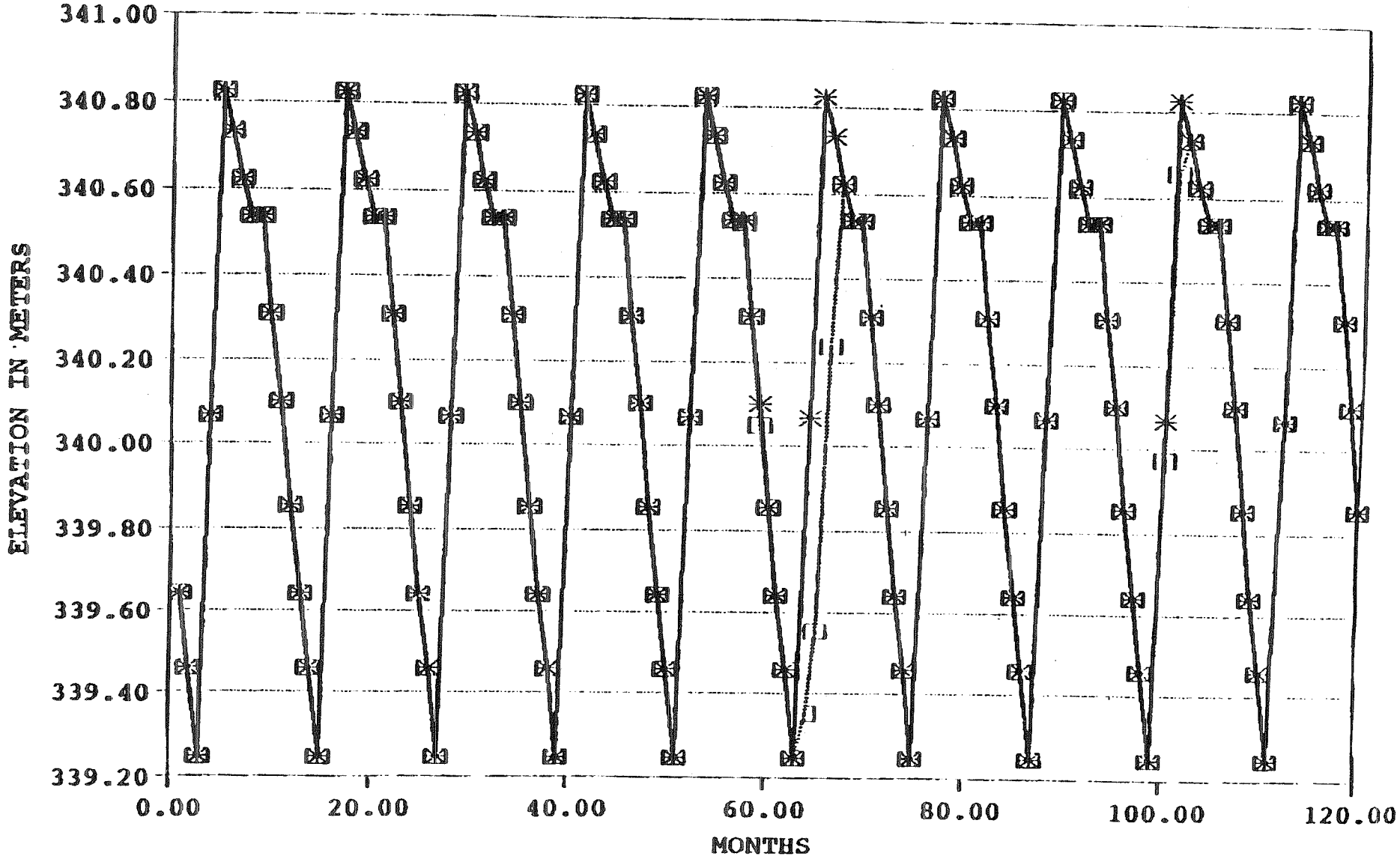
NAMAKAN LAKE
FREQUENCY OF DEVIATIONS GREATER THAN LEVEL OF 1118.6 feet

YEAR	NUMBER OF DAYS												NUMBER OF MONTHS	% OF TIME
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
1957	0	0	0	0	0	1	0	0	0	0	0	0	1	0.3
1958	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	1	3	0	0	0	0	0	0	2	1.1
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	1	4	0	0	0	0	0	0	2	1.4
1964	0	0	0	0	0	14	0	0	0	0	0	0	1	3.8
1965	0	0	0	0	0	8	0	0	0	0	0	0	1	2.2
1966	0	0	0	0	19	21	0	0	0	0	0	0	2	11
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	23	31	2	0	0	0	0	3	15.3
1969	0	0	0	0	0	9	0	0	0	0	0	0	1	2.5
1970	0	0	0	0	1	30	5	0	0	0	0	0	3	9.9
1971	0	0	0	0	2	0	0	0	0	0	0	0	1	0.5
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	17	0	0	0	0	0	0	1	4.7
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	8	22	0	0	2	8.2
1978	0	0	0	0	1	6	0	0	0	0	0	0	2	2.5
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	4	3	0	0	0	0	0	2	1.9
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	5	0	0	0	1	1.4
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: Simulated Operation in Accordance With Steering Committee Proposed Rule Curve

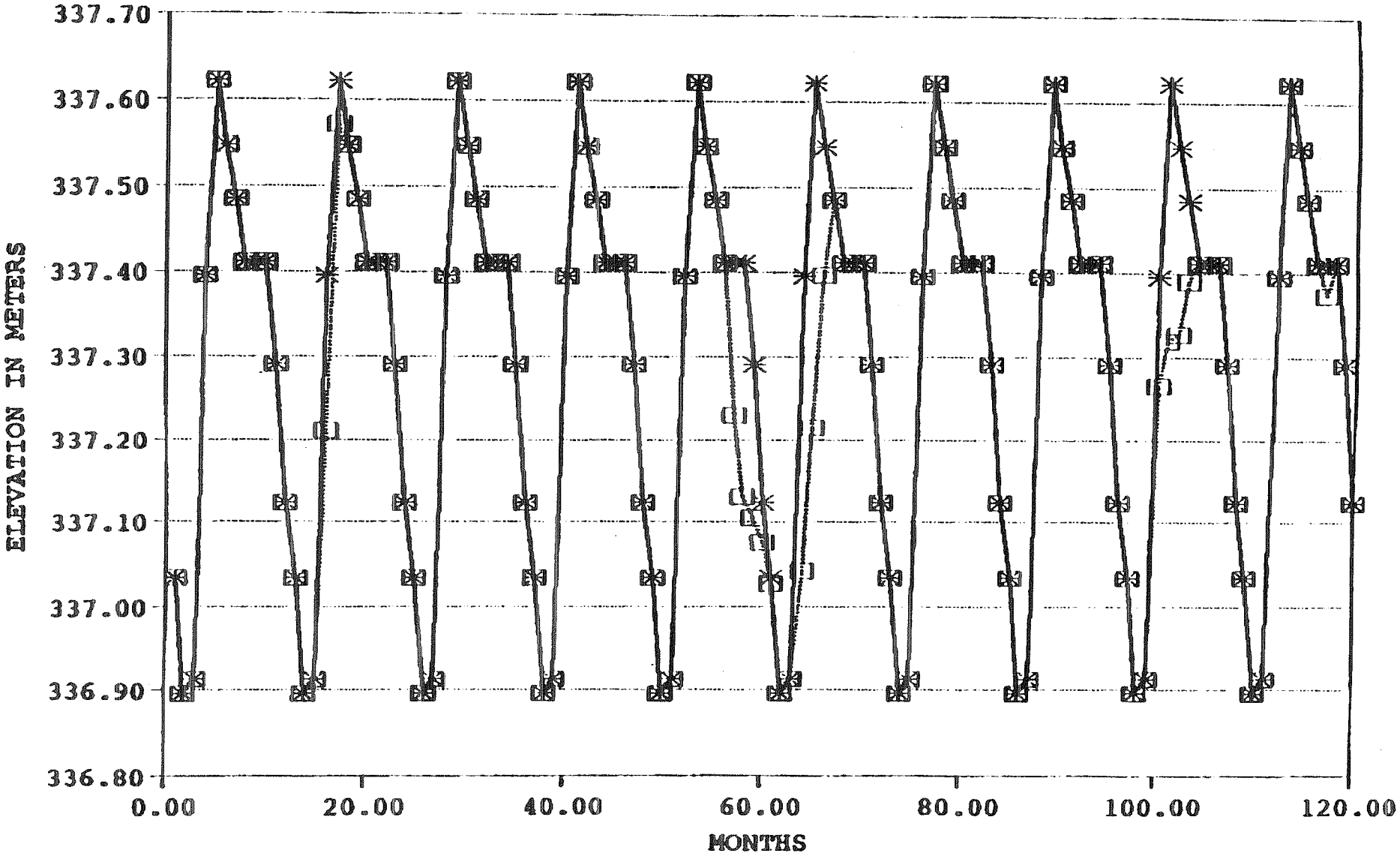
Source: Acres International, Ltd.

FIGURE F-1
NAMAKAN LAKE
COMPARISON OF PROPOSED WATER LEVELS TO SIMULATED WATER LEVELS, 1972 - 1981



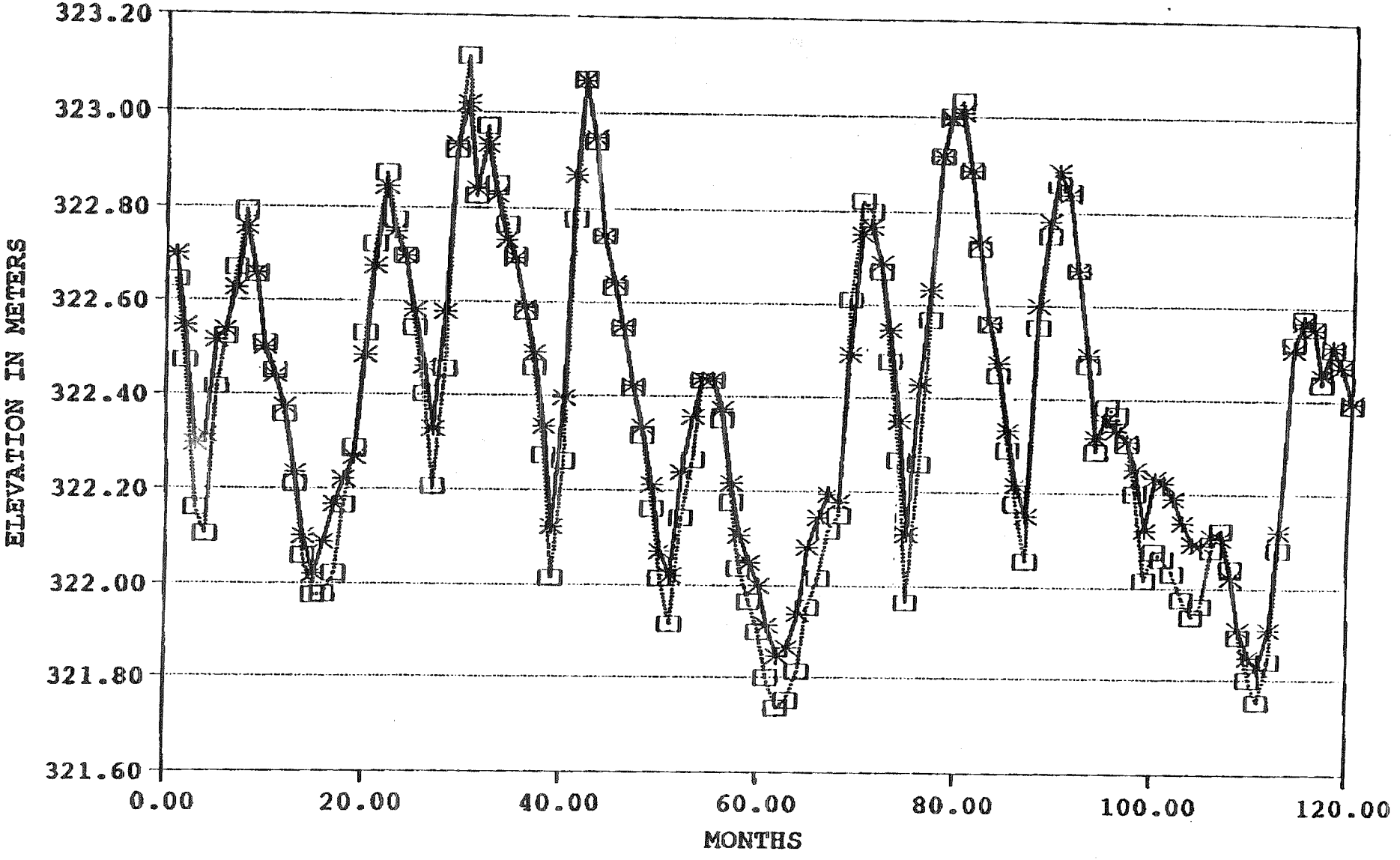
Source: Flug, 1986. Analysis of Lake Levels at Voyageurs National Park

FIGURE F-2
RAINY LAKE
COMPARISON OF PROPOSED WATER LEVELS TO SIMULATED WATER LEVELS, 1972 - 1981



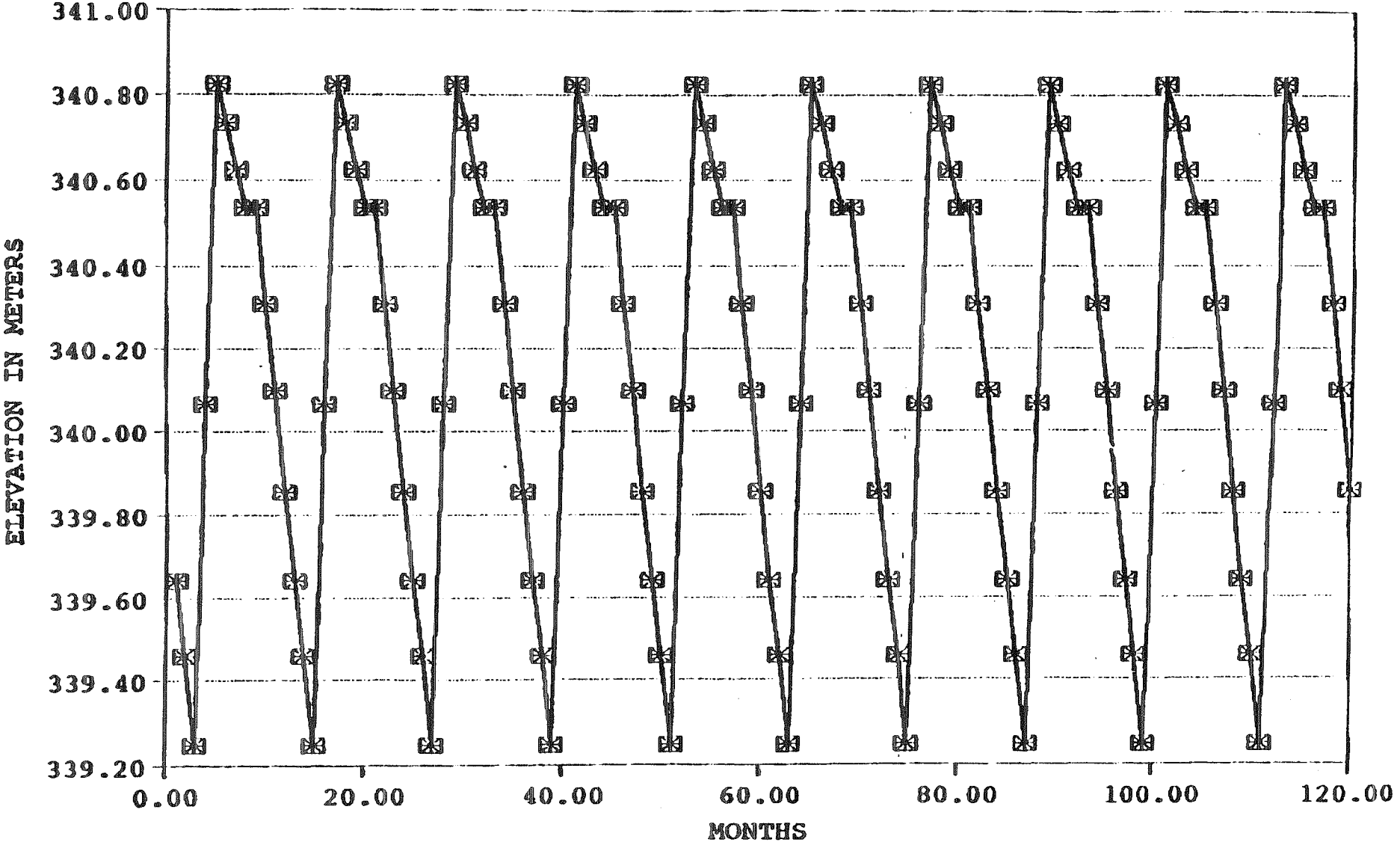
Source: Flug, 1986. Analysis of Lake Levels at Voyageurs National Park

FIGURE F-3
LAKE OF THE WOODS
COMPARISON OF PROPOSED WATER LEVELS TO SIMULATED WATER LEVELS, 1972 - 1981



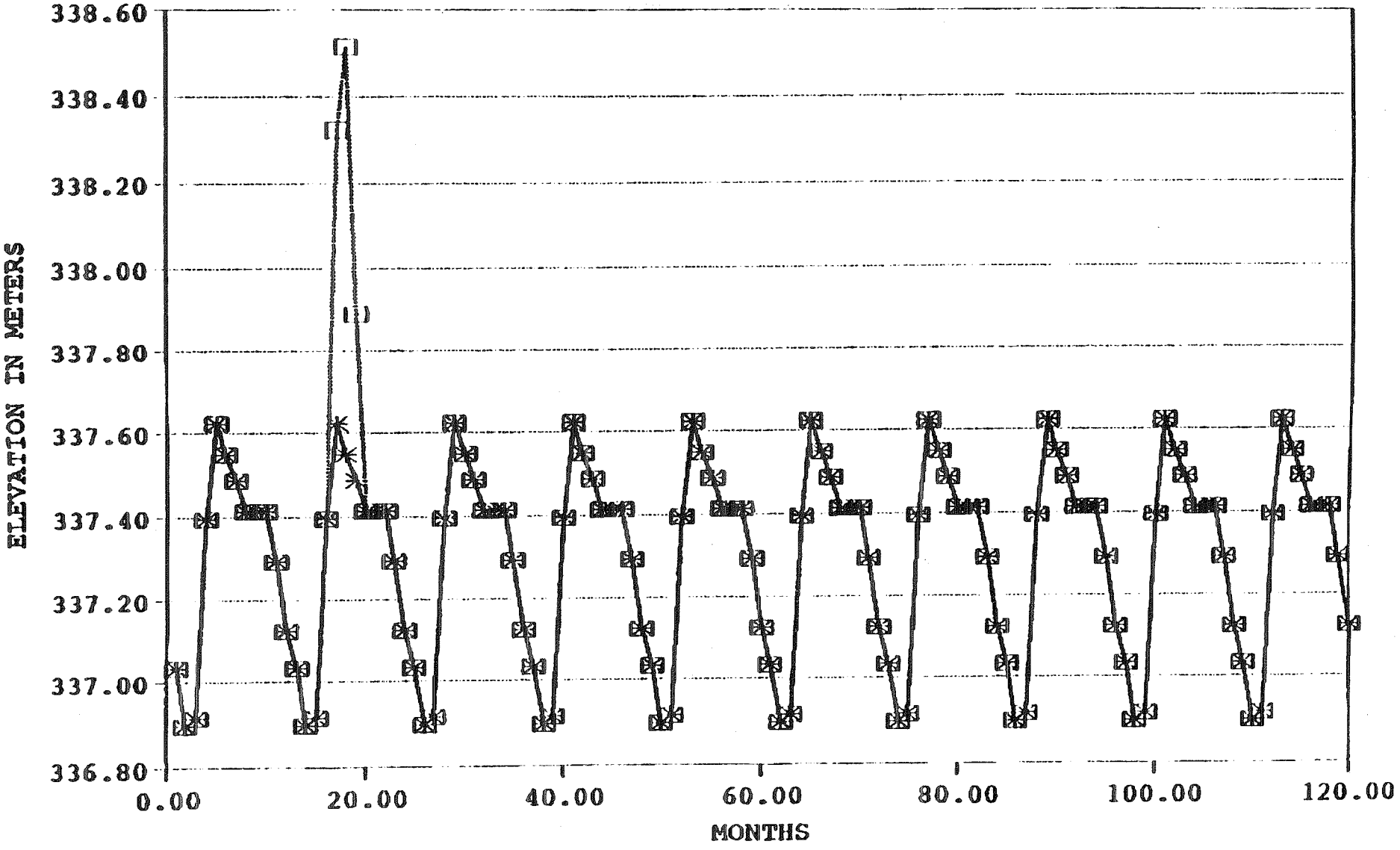
Source: Flug, 1986. Analysis of Lake Levels at Voyageurs National Park

FIGURE F-4
NAMAKAN LAKE
COMPARISON OF PROPOSED WATER LEVELS TO SIMULATED WATER LEVELS FOR 10 CONSECUTIVE YEARS OF HIGH FLOW



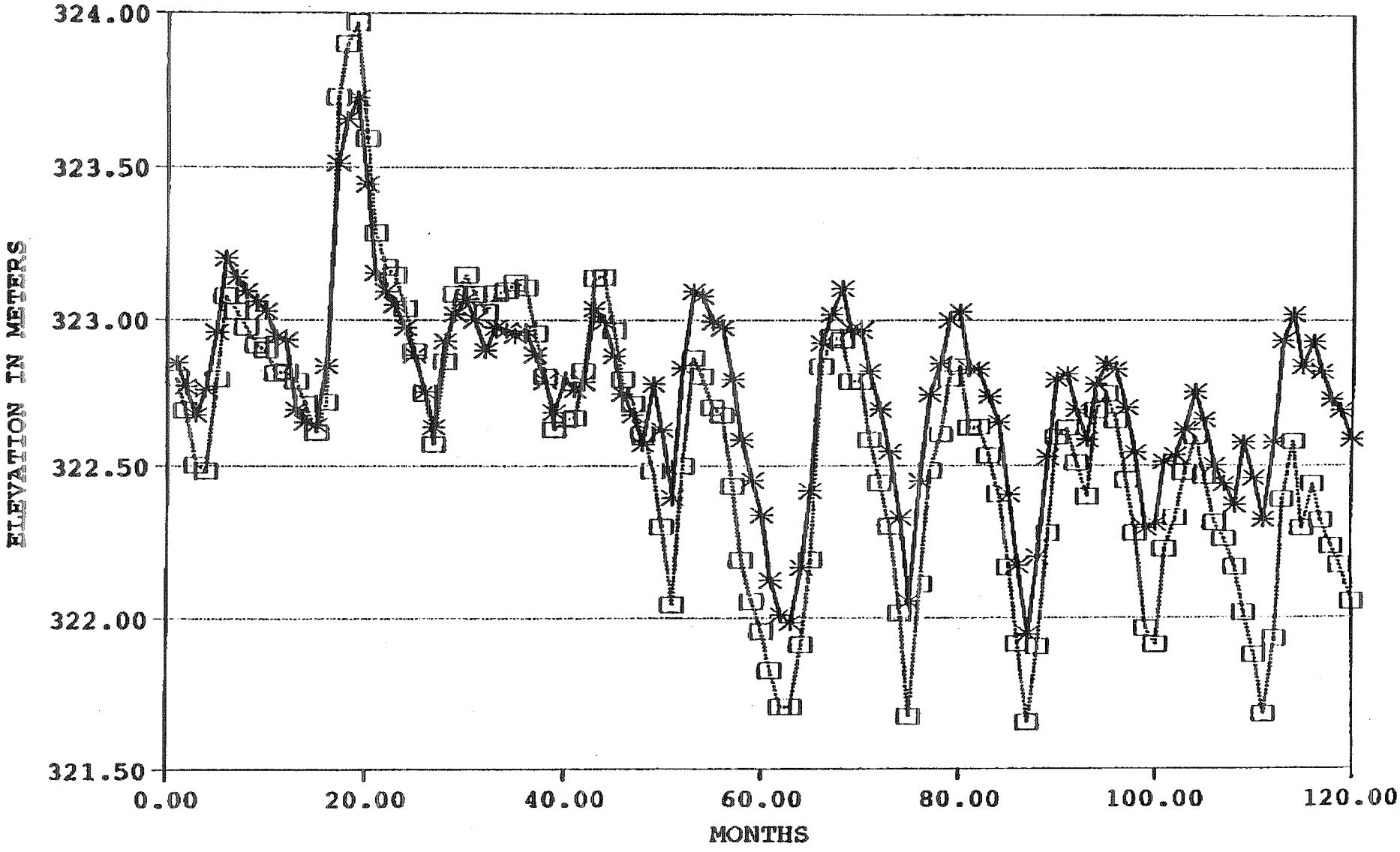
Source: Flug, 1986. Analysis of Lake Levels at Voyageurs National Park

FIGURE F-5
RAINY LAKE
COMPARISON OF PROPOSED WATER LEVELS TO SIMULATED WATER LEVELS FOR 10 CONSECUTIVE YEARS OF HIGH FLOW



Source: Flug, 1986. Analysis of Lake Levels at Voyageurs National Park

FIGURE F-6
LAKE OF THE WOODS
COMPARISON OF PROPOSED WATER LEVELS TO SIMULATED WATER LEVELS FOR 10 CONSECUTIVE YEARS OF HIGH FLOW

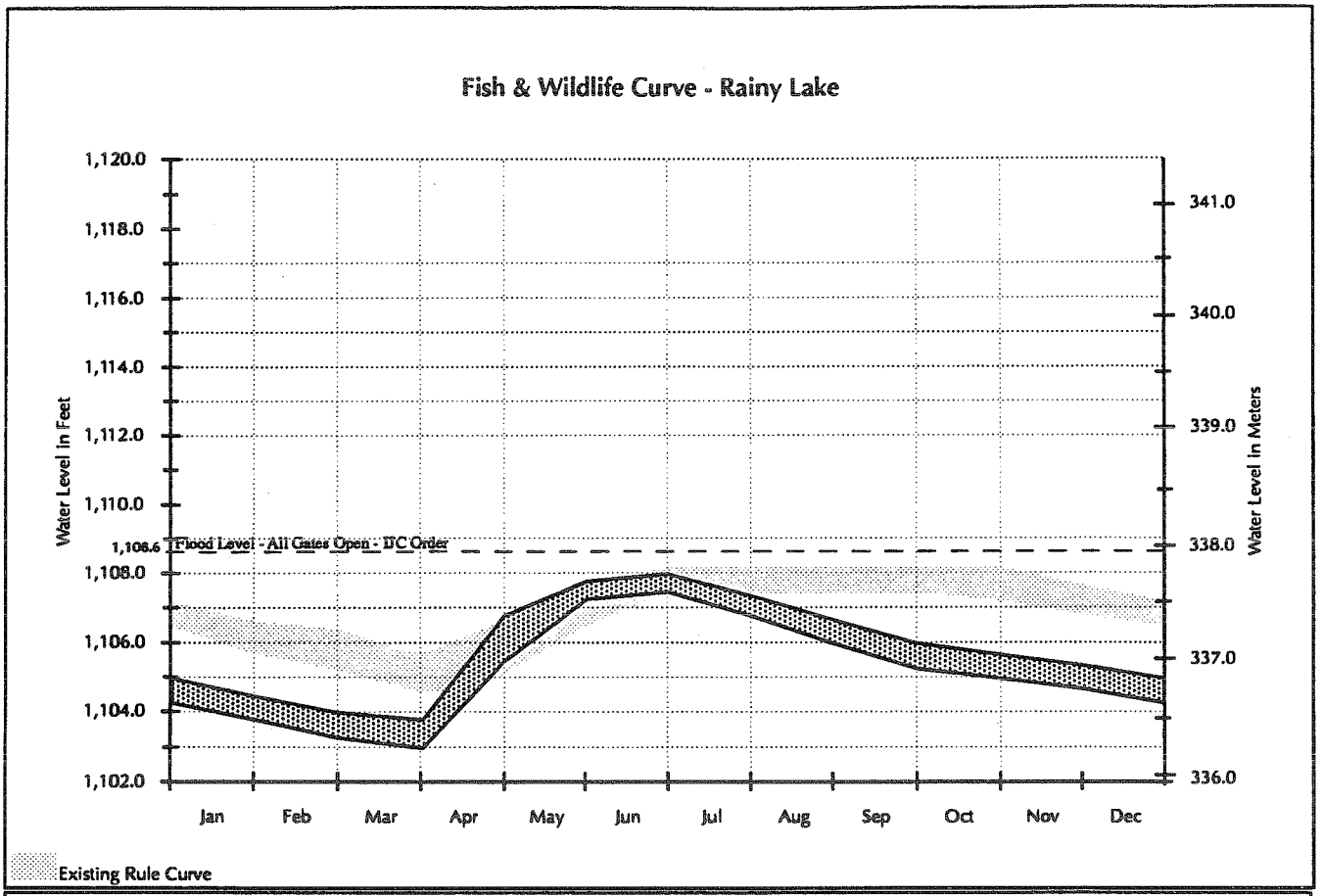


Source: Flug, 1986. Analysis of Lake Levels at Voyageurs National Park

APPENDIX G

WATER LEVEL CURVES
USED IN DEVELOPMENT OF STEERING COMMITTEE PROPOSAL

FIGURE G-1
SINGLE PURPOSE OPTIMIZATION CURVES FOR FISH AND WILDLIFE



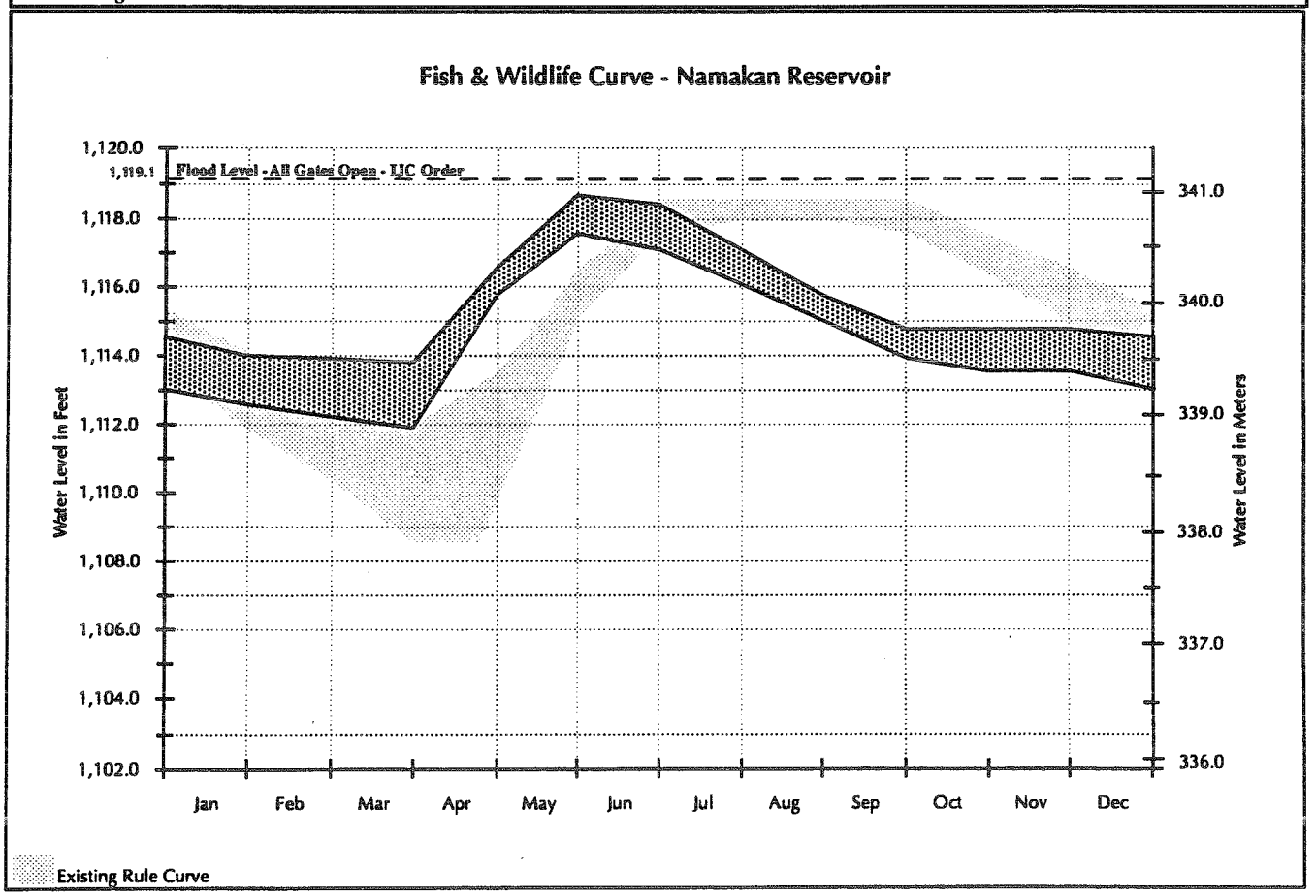
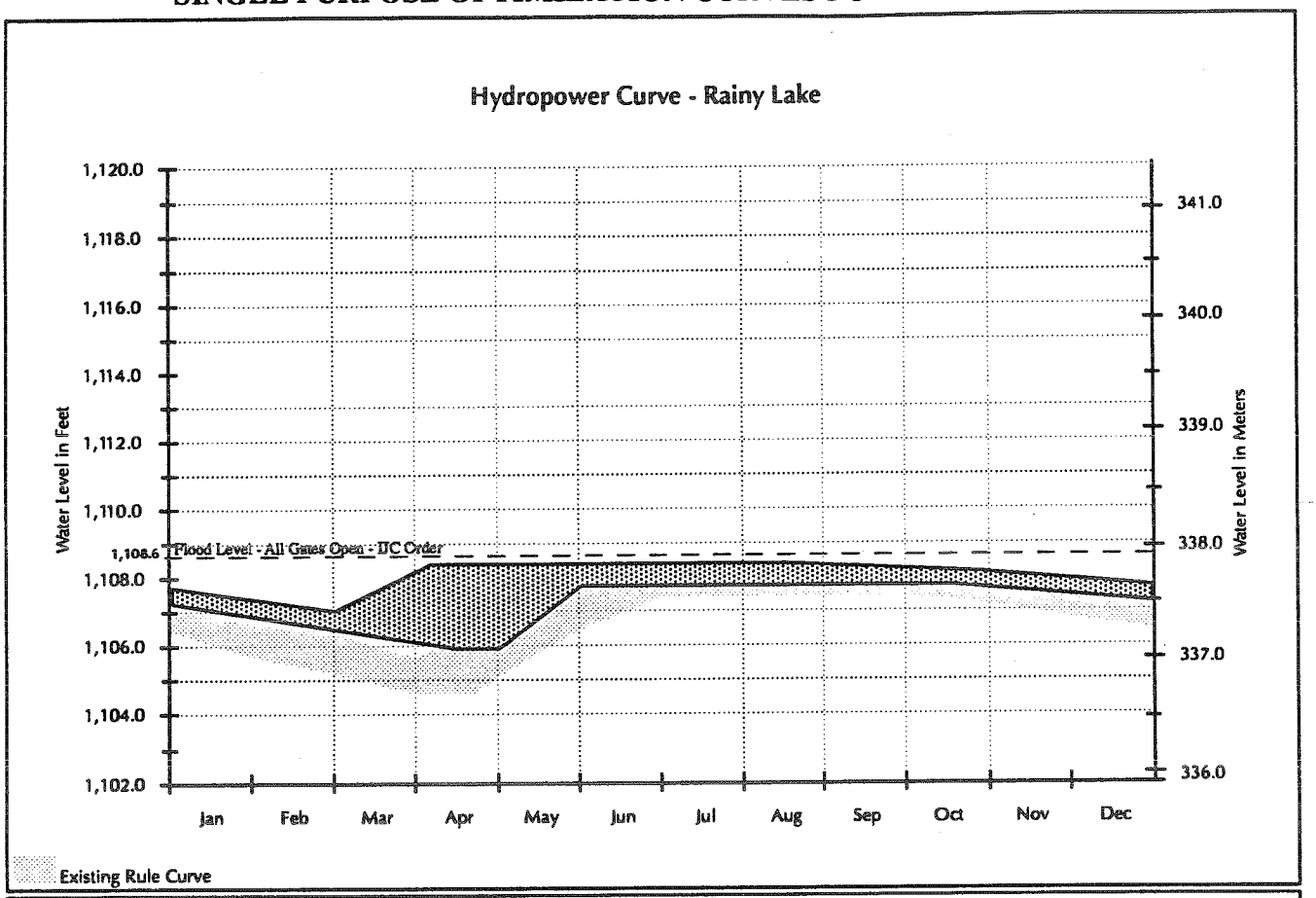


FIGURE G-2
SINGLE PURPOSE OPTIMIZATION CURVES FOR HYDROPOWER



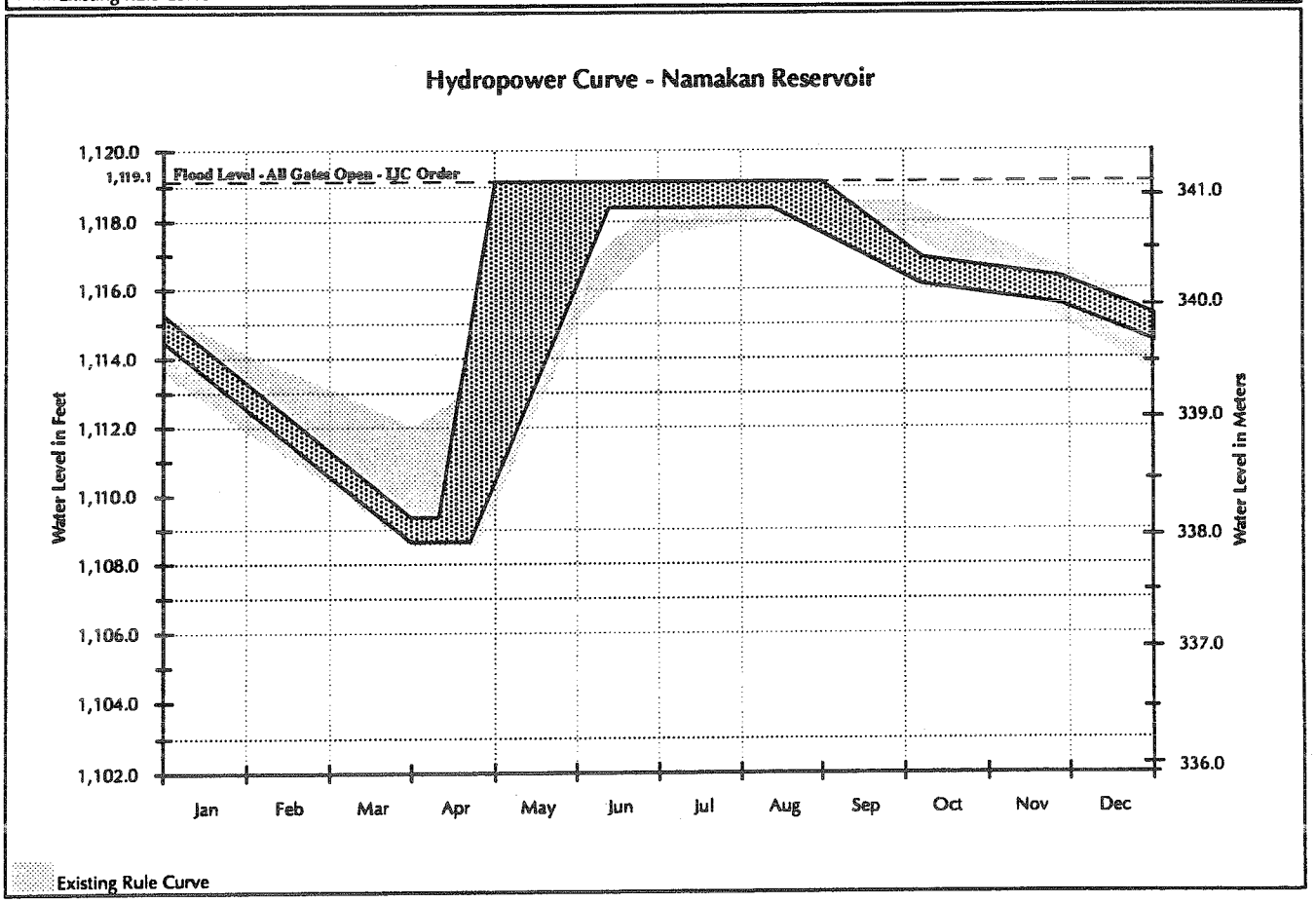
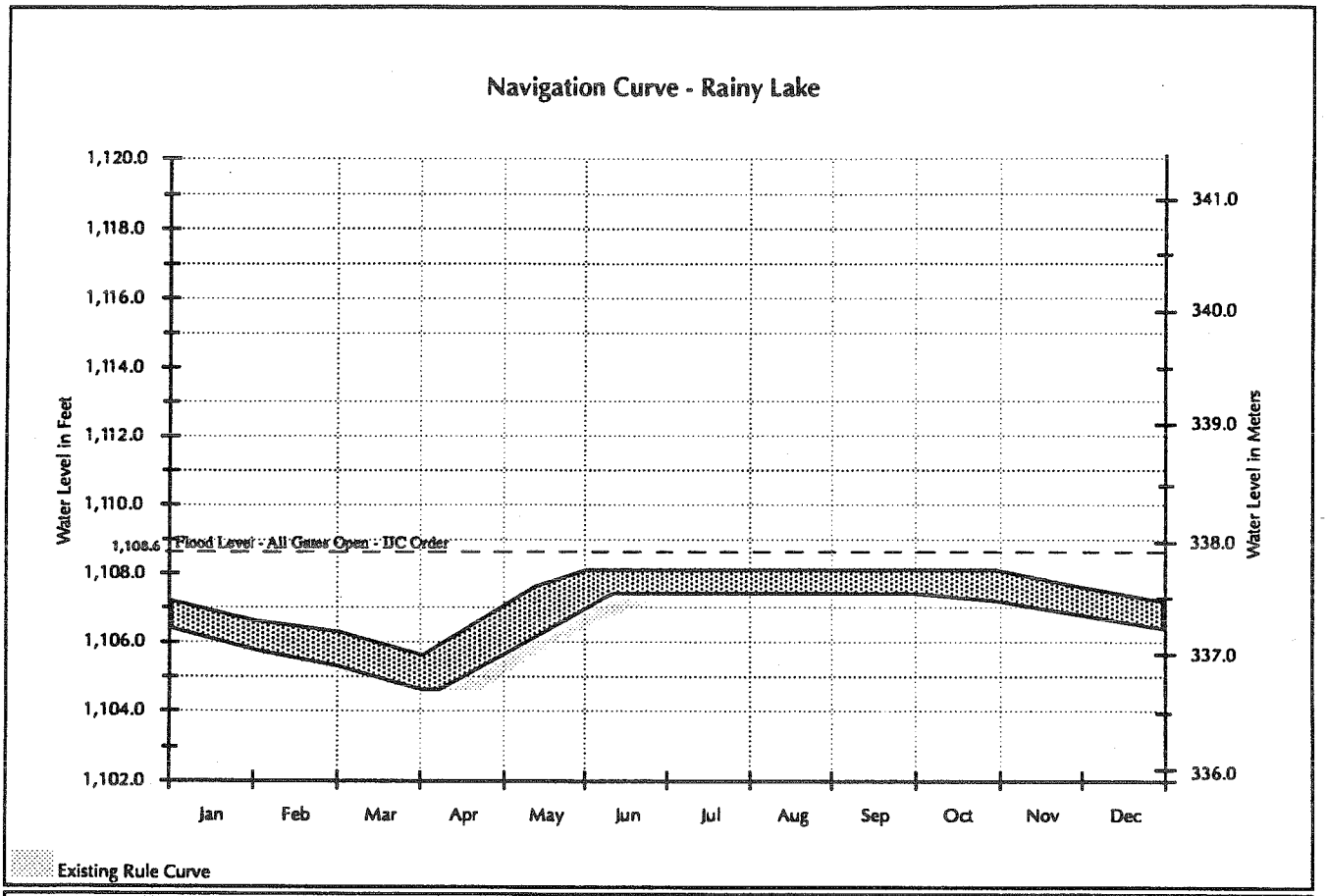


FIGURE G-3
SINGLE PURPOSE OPTIMIZATION CURVES FOR NAVIGATION



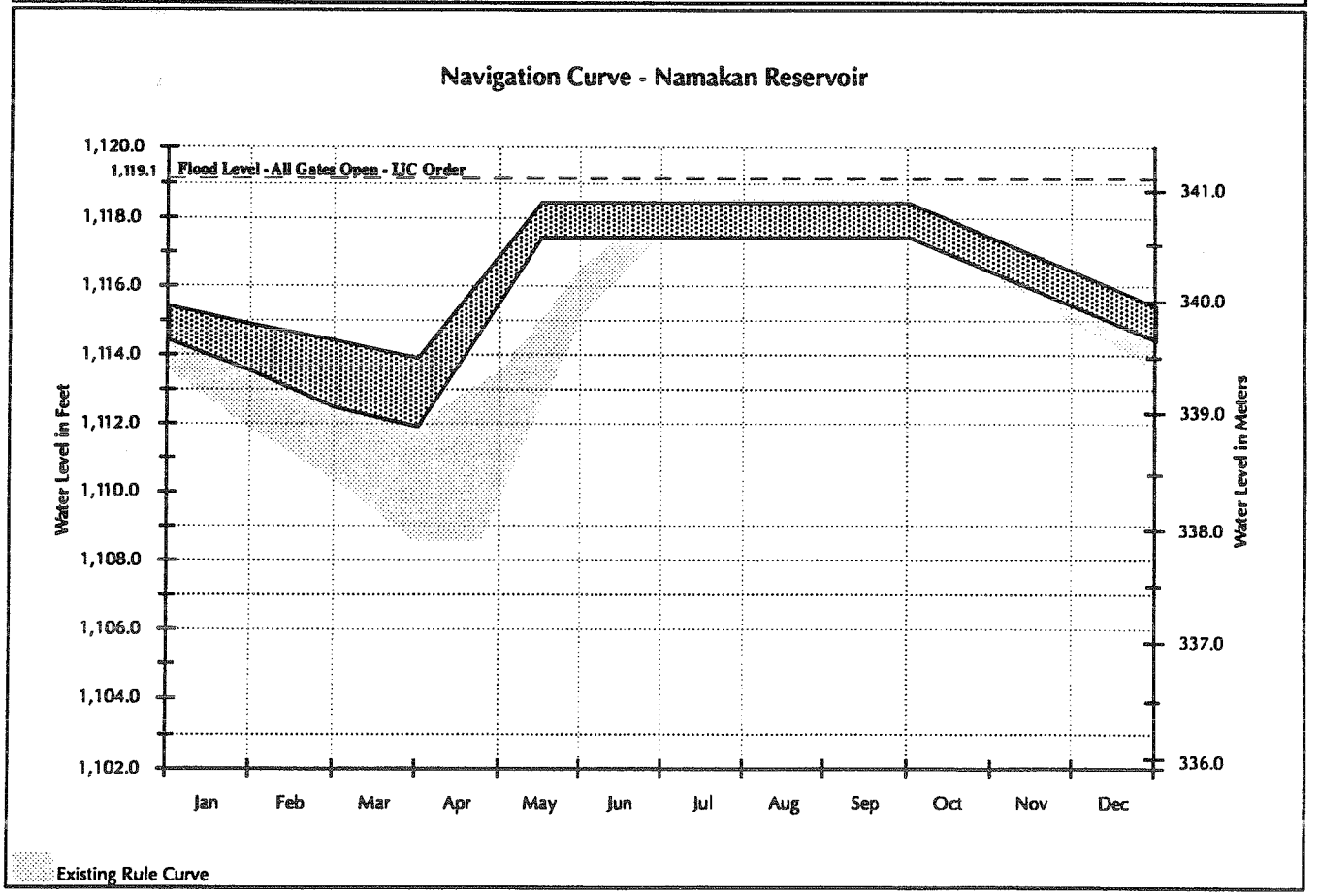
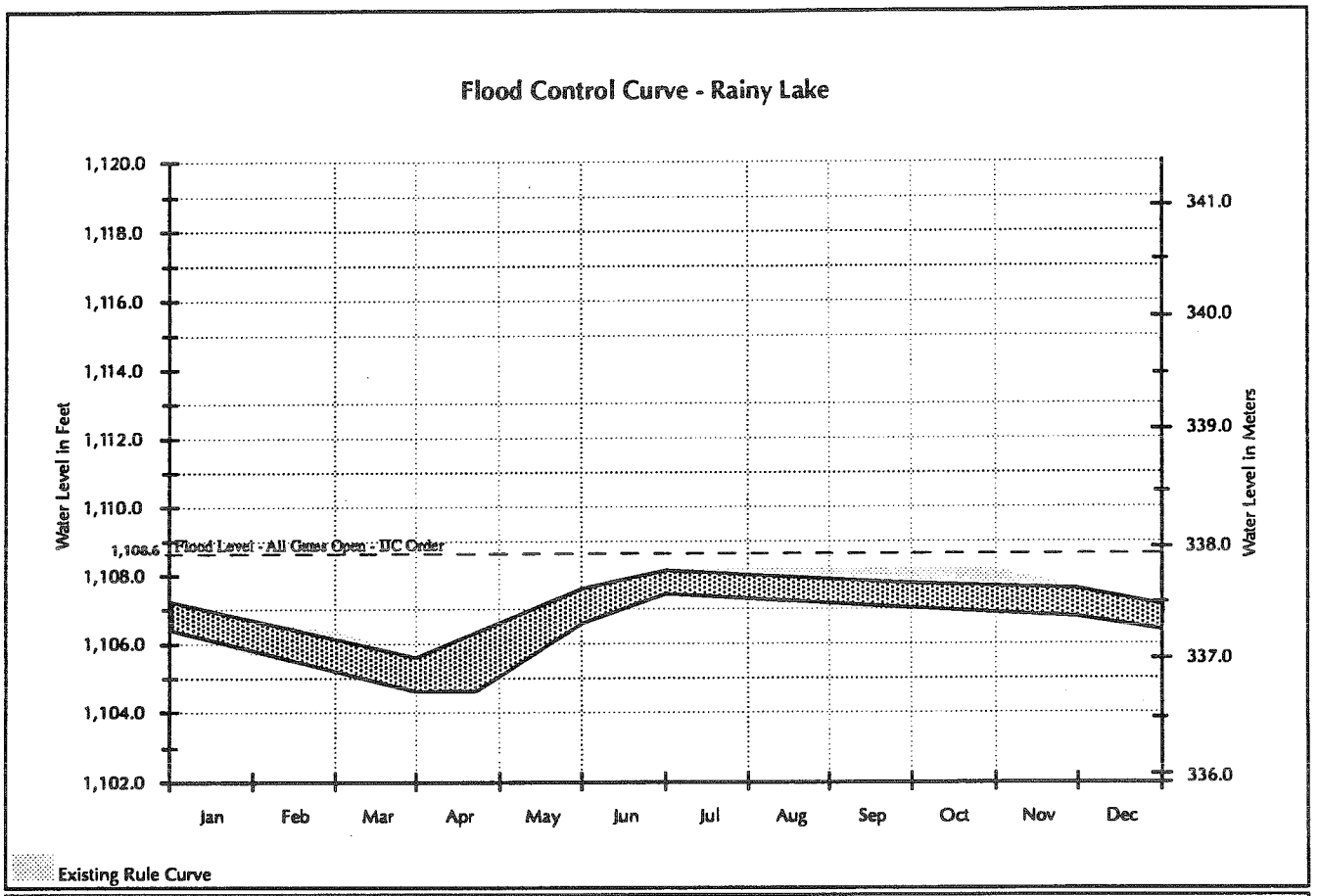


FIGURE G-4
SINGLE PURPOSE OPTIMIZATION CURVES FOR FLOOD CONTROL



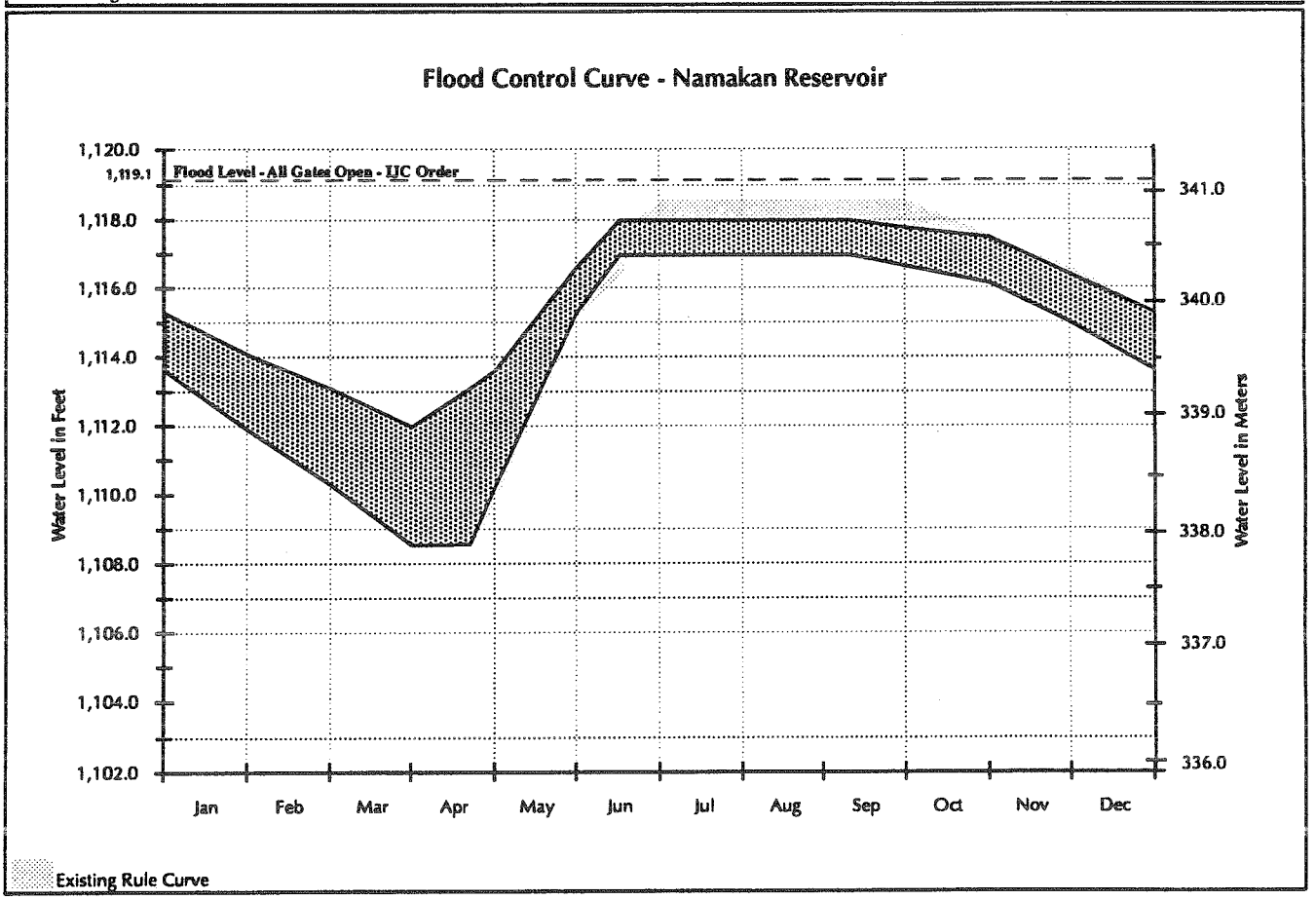


FIGURE G-5
SINGLE PURPOSE OPTIMIZATION CURVE FOR WILD RICE

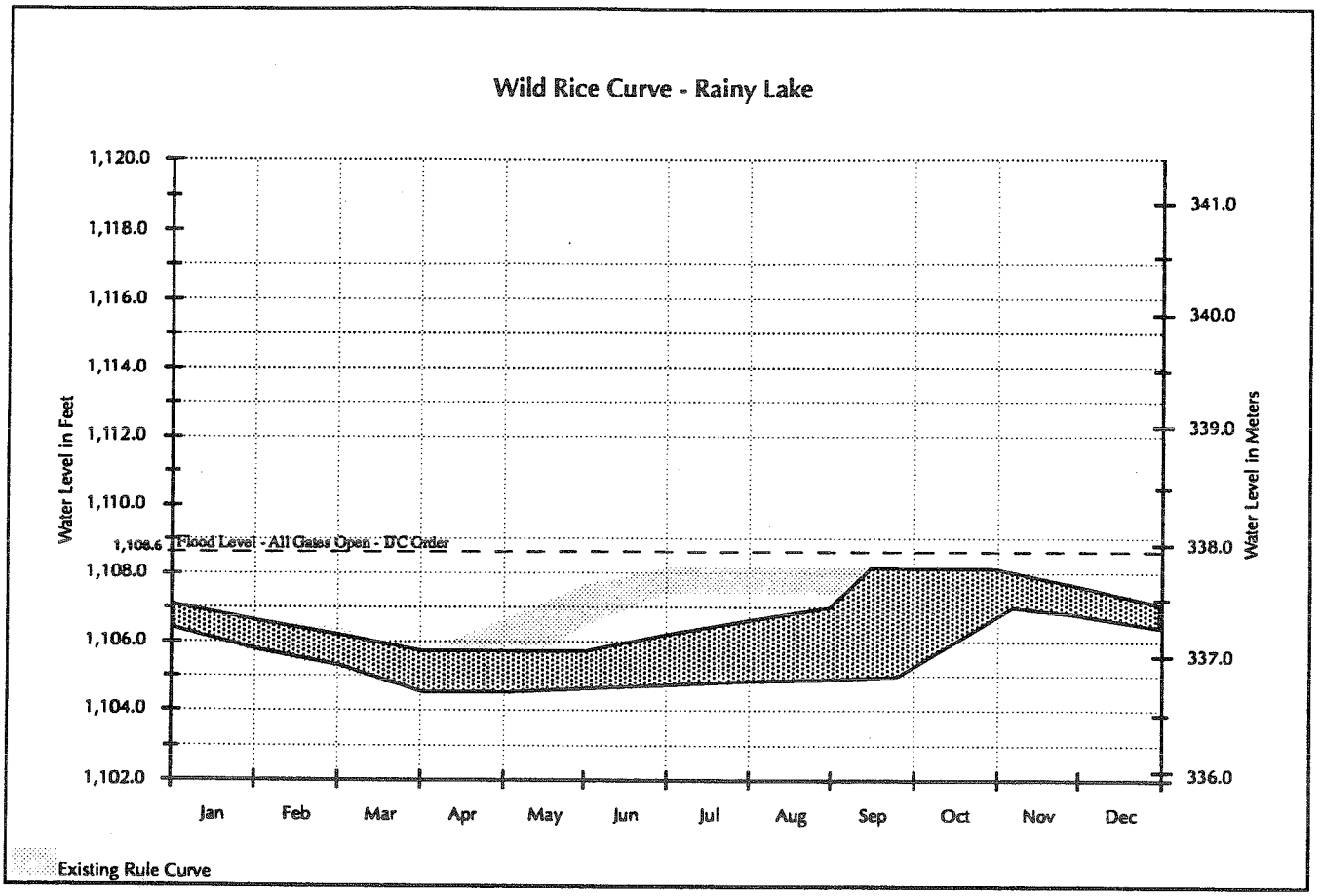
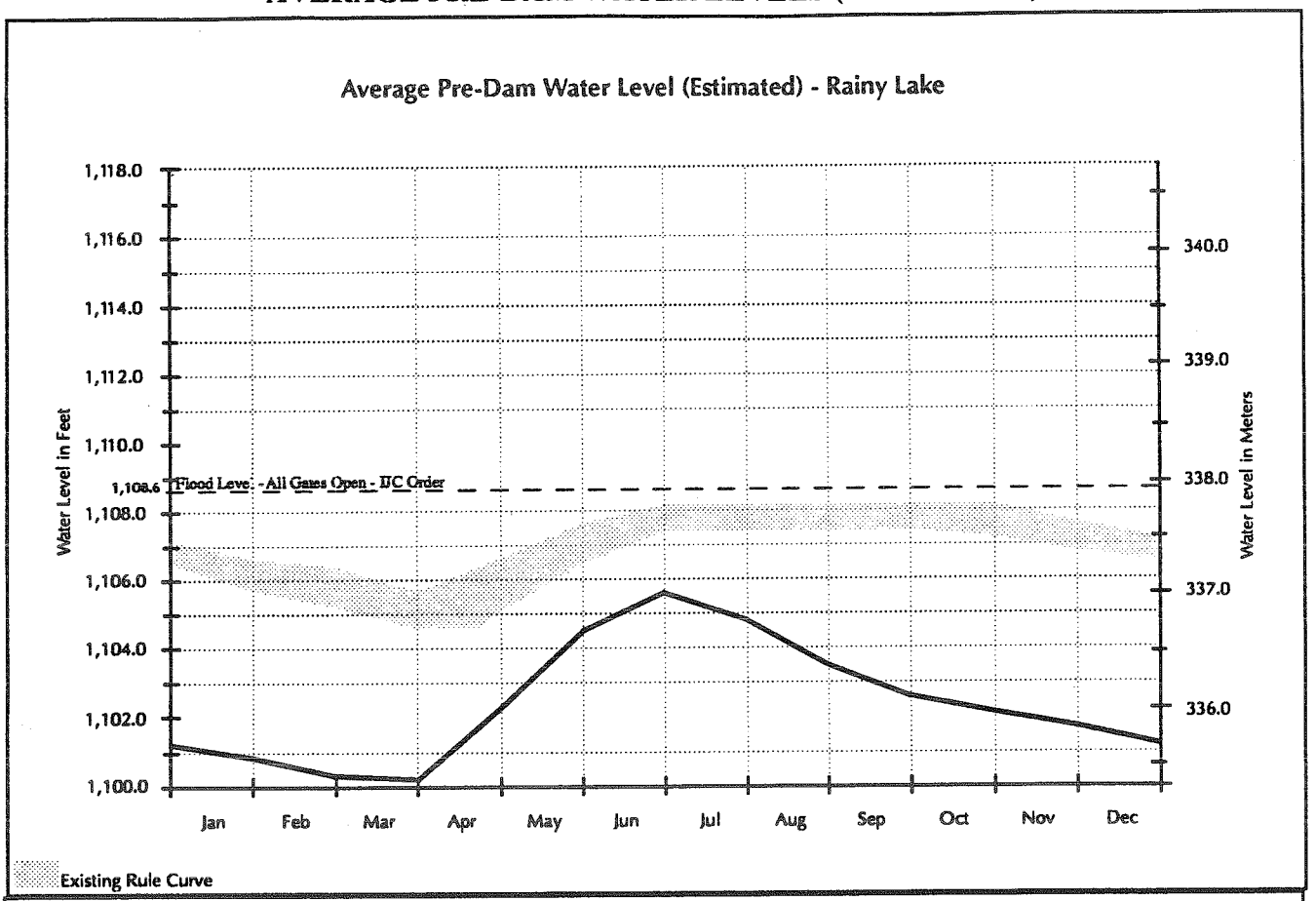


FIGURE G-6
AVERAGE PRE-DAM WATER LEVELS (ESTIMATED)



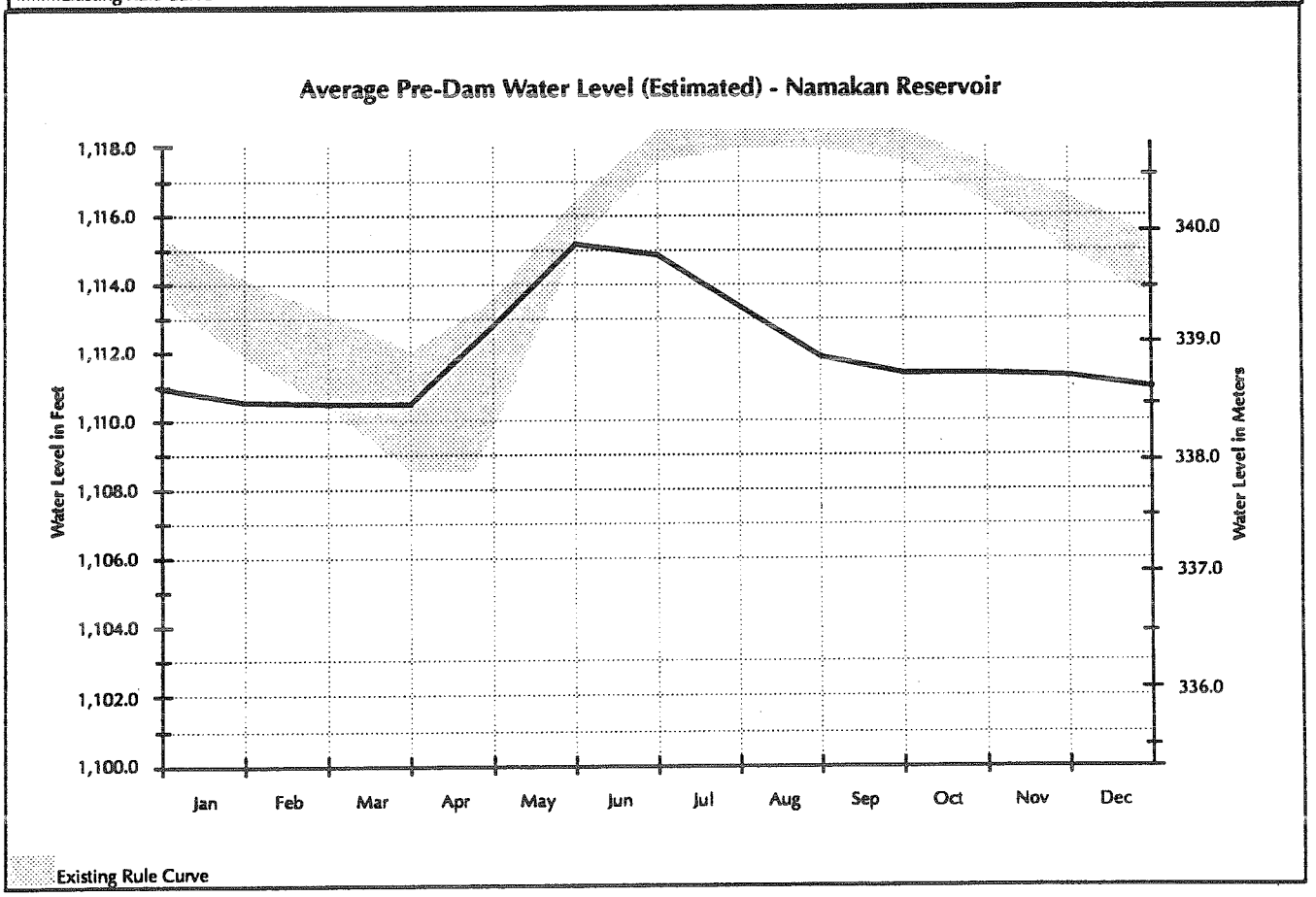
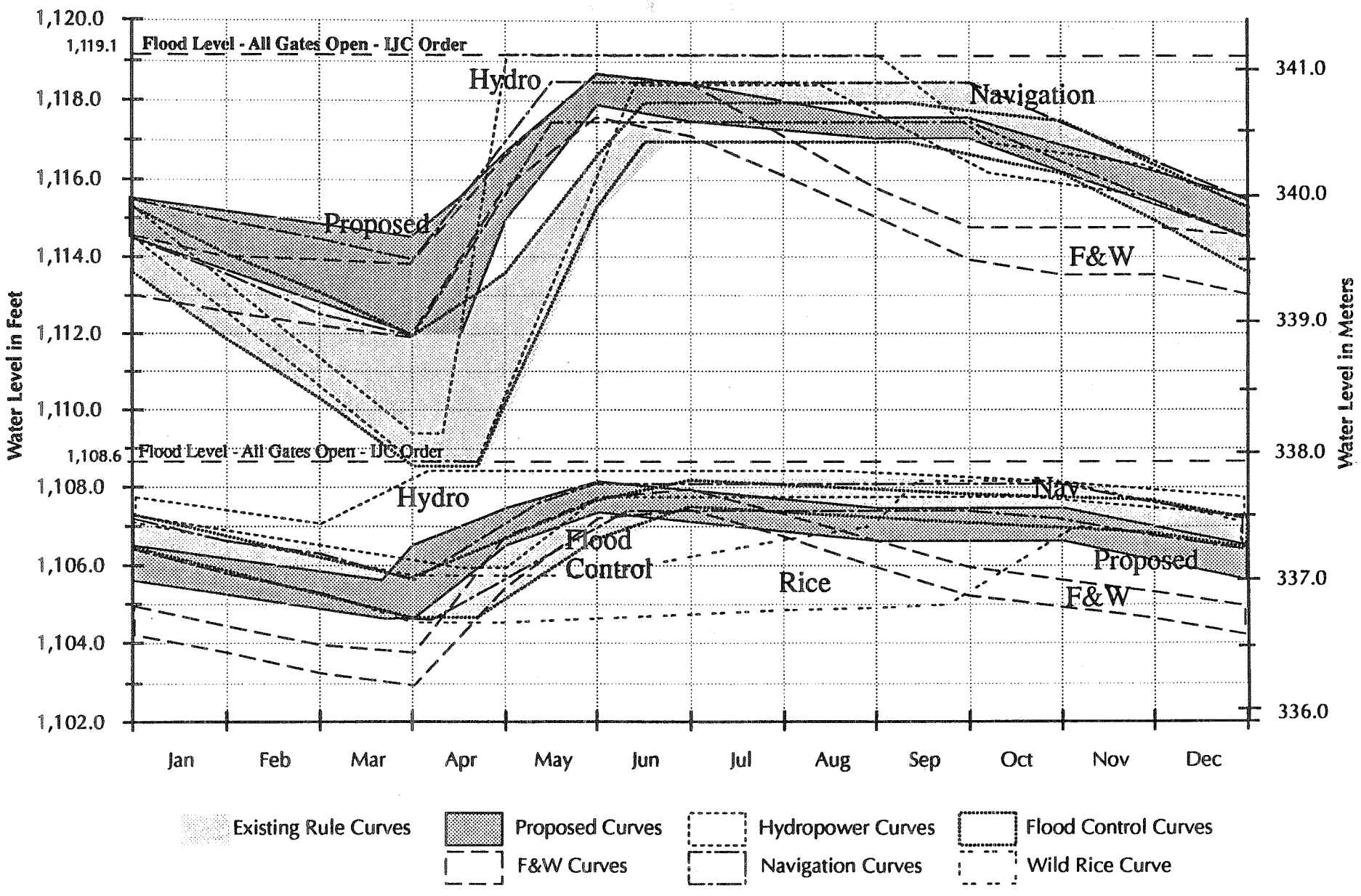


FIGURE G-7
PROPOSED CURVES WITH SINGLE PURPOSE OVERLAYS



APPENDIX H

ASSESSMENTS OF JULY 1993 BOISE CASCADE REPORTS

ON FISH, WILDLIFE, FLOODING AND CALIBRATION/SENSITIVITY

Ontario
Ministry of Natural Resources
Ministère des Richesses naturelles

Walleye Research Unit
Research, Science and Technology Branch
435 James Street South, Suite 335
Thunder Bay, Ontario
P7E 6E3

October 22, 1993

Dr. William R. Darby
Area Supervisor
Rainy Lake Area
Fort Frances District

Dear Bill:

I have reviewed the Cadmus Group Inc. report submitted to Boise Cascade Corporation, International Falls, Minnesota, the International Steering Committee report and browsed through most of the associated material. Most of the information provided in various reports suggest to me the new rule changes should be tried.

I believe the walleye carrying capacity in Rainy Lake was reduced by water level changes that are described in Figure 1 by Joe Scidmore and Fritz Johnson, starting in the 1940's and 50's and continuing through the 1960's. The reduction was rather gradual over a period of three decades; thus, any changes in abundance or in age-class structure due to repeatedly smaller incremental recruitment rates would not be easily detected by the approaches used or by analyzing ages. If water levels had noticeable negative impact on walleye spawning success, the mean age of the catch should increase due to repeated recruitment failure. In fact, just the opposite occurred. The mean age of the walleye catch in Rainy Lake declined, suggesting the fishing-up process and finally overexploitation reduced the older brood stock. The powerful overfishing effects would have easily masked the effects of gradual reduced recruitment due to the negative influences of water level.

The Cadmus report focused mainly on criticizing the Cohen et al report and really didn't adequately address the studies which were contrary to their own conclusions. Since Cohen and Parkhurst analyzed the same data set, I am surprised at the difference in their findings. I believe a rebuttal is in order from Cohen et al or at least some common statistical approach acceptable to both parties be completed. The Steering Committee deserves to know whether

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statistically reliable correlations really exist or not. If these two prominant groups can't find common ground, how are the rest of us supposed to make sense out of the statistical treatment of the data?

Since, there's so much uncertainty in the interpretation of their analyses, I don't believe their conclusions warrant a great deal of consideration when making rule change decisions. Because of the high degree of uncertainty, large variances and wide confidence intervals, and opposing conclusions, their models presently have limited, if any, predictive value.

As you recall, I recommended earlier that you not overreact to Cohen's recommendations until the statistical procedures have been subjected to peer review. After reading the Cadmus report, I feel even better about my suggestion.

There are a few concerns I have in the way the Cohen and Parkhurst studies analyzed the data. First, as the Cadmus Group rightly explains (Page 20) a weak coherence between YMXR and walleye recruitment does not imply a causal relationship. They go on to say that in natural systems it is common to observe an erroneously high coherence if an important explanatory variable is omitted from the analysis. Using their example, if both YMXR and catch are corrrelated to some other variable omitted from the analysis, then the supposed coherency between YMXR and catch may be erroneous.

I believe some other variable exists. The weak coherence between YMXR and walleye recruitment may be because high water levels are associated with cold, wet summers which would not favor walleye year class strength (See enclosed study on Lac des Milles Lacs by Fruetel and Ritchie, Enclosure 1).

Thus, the negative relationship between walleye abundance and high water level may be an artifact because high water level may be associated with cold, wet springs. During the period of 1978-1989 (report enclosed), strong walleye year classes produced in Lacs des Mille Lacs occurred when low levels of spring rainfall occurred with warm summers. There was one exception in 1987. During that year, a very weak year-class occurred during a warm summer when the lowest recorded spring water level was observed. However, Bev Ritchie informs me that during the warm summer of 1987, relatively strong year classes were produced in Shoal Lake and Lake of the Woods. This suggests that some habitat threshold may have been exceeded in Lacs des Mille Lacs by the very low water level. Likely, these thresholds vary between lakes.

A more proper analysis to test effects of water level on walleye year class might be to compare high and low water levels during warm and cold summers. This

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matrix would provide an opportunity to see if there are additional benefits to walleye recruitment from higher or at least adequate water levels during warmer summers. Otherwise, high water level benefits would be neutralized by low temperatures during cold summers.

Second, both Cohen and Parkhurst looked for correlatives between water level indices, etc., and catch after several lag periods to permit the recruits to enter the fishery. However, during the fishing-up process, as the older fishes were disproportionately harvested, the mean age of the walleye population declined in Rainy Lake. Therefore, as the walleyes compensated to exploitation, their turnover time in the fishery would be reduced as they grew faster and matured earlier. Therefore, the lag time should have been reduced accordingly. If this wasn't done, then the analyses would lose sensitivity as the original lag times would no longer be appropriate. Food for thought Bill!!

Another important consideration, which seemed to be omitted from almost all of the reports, is what effect does water level have on water clarity. Water levels may affect various basins differently. In some basins, lowering water levels may reduce erosion and increase water clarity which favors fish other than walleye such as northern pike, bass and blackcrappie. Conversely, in shallow basins, lowering water level may resuspend sediments and nutrients causing phytoplankton blooms, increasing turbidity, and altering the fish community structure favoring fish more adapted to lower light conditions, such as walleye. Dr. P.H. Monson mentions water level effect on turbidity in his report, page 45.

The apparent contradictory results tabulated in the Cadmus Group report (Table 1) could be due to a number of reasons which weren't properly addressed. For one, the various reports didn't cover the same periods of time and Osborn et al. 1981 data couldn't be compared to the Scidmore and Johnson's study because the fishery practices had changed. Also, the spring water levels caused by the 1969 rule curve adjustment did not establish minimum lake levels sufficient for improving spawning conditions (Osborn et al. 1981 citing Chevelier, 1977). Most of the water level effects occurred before 1969 and the various walleye stocks in Rainy Lake collapsed in the 1960's. During and following the collapse of the various walleye stocks, their recovery was more dependent on the size of the brood stock than other explainatory variables tested. Thus, the recovery in the East Arm was not correlated with water level. Likely, the fishing pressure had reduced the size of the population below the carrying capacity for the present water level regime. The population recovery was due to fishery regulations and management initiatives and not water level adjustment. Also, since the 1969 rule curve regulations have been in effect, which included a period of years with lower than normal rainfall, Rainy Lake water levels have varied less than historical (natural) levels.

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The references, the Cadmus group report, and most of the walleye literature are in agreement that temperature is the most important factor determining walleye year-class strength. Therefore, the effects of temperature would likely mask water level benefits unless a properly statistically designed study was used to separate out the differences.

Following are additional comments regarding the various reports for your consideration.

International Steering Committee Report

I found the Steering Committee Report to be comprehensive, thorough and sensitive to the needs of the various users of the border waters. However, the section on upstream and downstream impacts (especially downstream, p. 69) was rather meager. Although the Steering Committee recommendations adhere to the existing IJC maximum and minimum discharge requirements, they are still proposing major seasonal flow changes. What impact will these changes in flow, out of Rainy Lake, have on the walleye and sauger populations in the Rainy River and especially the recovering Lake Sturgeon population. Will flows from the Big and Little Fork River be adequate to support these fisheries? If you have additional information to alleviate these fears, they should be included in the Steering Committee Report.

Chevelier's Publication

I remembered there was a concern regarding Chevalier's PERCIS paper on Rainy Lake. After reviewing the old files, I found the enclosed letter from John to myself (Enclosure 2). As John acknowledges Fred Fry, who refereed the paper for me, thought the simultaneious decrease in walleye abundance, brood stock and water level in Figure 7 may be somewhat spurious and suggested we look at virtual populations which he thought could be calculated from the commercial catch. But John said there wasn't sufficient data to do that type of analyses, so we went with the data we had at the time. Now, almost two decades later, is there sufficient data. Calculation of virtual populations, even if we assume a 50% total mortality, would give us an index of year-class strength which could be compared to water levels on the border waters which may give us a more precise indication of water level effects.

The Dave Friedl Correspondence

The Dave Friedl correspondence was good and pointed out that high water levels favored Northern pike recruitment; but, were detrimental to walleye recruitment in Lake Kabetogama. Again, it should be determined whether high

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water level or the cold, wet summers often associated with high water levels were the cause of the negative relationship with walleye. I agree that a healthy northern pike population is desirable for maintaining a balanced fish community in Lake Kabetogama.

The Scidmore/Johnson Report

The time frame over which the stressor is operating must be important in interpreting the data. In the Scidmore/Johnson report, the potential negative impact of lowering water levels over decades would be subtle and insidious. The use of mean age to detect recruitment failure would likely be too insensitive because a slow erosion of year class strength might not be detected from gradual changes in water levels. However, an abrupt increase in fishing pressure would lower the age structure dramatically, as it did, and probably masked any subtle water level effect on age structure. The strong correlation in Figure 1 of this report is hard to refute.

Kallemeyn Papers

Significant positive correlations were found between lake level, and walleye year-class strength (at least size of hatch) in three of the four lakes sampled. The same correlation was found in one lake for yellow perch.

Serns (1987) has shown that there is a negative relationship between size of hatch and harvest. Although the larger hatches produced the largest catches, the catches were not in proportion to the size of the hatch indicating higher natural mortality among stronger year classes in Escanaba Lake, Wisconsin (See enclosure 3 - excellent data). Also, as the Cadmus report suggests some year classes may not be determined during the first year, or strong hatches may not end up as strong year-classes. The Osborn et al (1981) report also suggests strong year-classes may not be established in the first year of life in Rainy Lake.

Large YOY hatches and strong year classes are not always synonymous. Many present-day authors are equating strong year-classes to strong hatches which may be questionable in certain fisheries.

Significant positive correlations were also found between thermal conditions during the 30-d period following ice-out and year-class strengths (large hatches) of walleye and yellow perch. The strongest year classes of both species were produced in years with higher, more stable temperatures. These observations agree with the literature and enclosed Lac des Mille Lacs report. These papers

...Page 6

do not demonstrate that strong YOY hatches become strong year-classes which contribute high cohort harvest during their life span. However, starting with a good hatch is a good prerequisite to a strong year class, all other things being equal (which they frequently are not). As the author points out-"In any particular year, reproductive success still will be susceptible to the vagaries of the weather as well as other biotic and abiotic factors. It is interesting that this study was conducted during the 1980's which was one of the warmest decades on record and would likely produce better than normal walleye hatches and likely year-classes. Thus, the 1980's should have been a good time for walleye recovery, all things being equal, such as having adequate water levels.

Osborn et al 1981 Report

The concern that northern pike have a negative impact on walleye due to a higher water level regime is pure speculation. Likely, high water level favored YOY northern pike and the associated cool, wet weather was detrimental to YOY walleye - no negative species interaction is required. Thus, the lack of a correlation between abundance and spring water levels is not surprising and does not preclude a beneficial influence of high water levels on walleye spawning. The populations may have recovered more rapidly if higher water levels had been attained consistently (Osborn et al. 1981). A case could also be made that more northern pike will keep suckers and yellow perch populations under control-create higher turnover rates of these latter species, which would provide more younger fish, which are more vulnerable to walleye predations. There is no evidence that walleye and northern pike abundance is interrelated.

A primary contribution of the Osborn et al 1981 report is showing under the given water level regime for that period, recruitment was dependant on the size of the brood stock (the abundance of brood stocks and progeny five years later was significantly correlated). We've observed similar relationships between brood stock/progeny in Lake Nippissing, Bay of Quinte, and western Lake Erie. These brood stock progeny relationships are more apparent when the brood stock is reduced to two levels of abundance (Colby 1984). When walleye abundance is this low, they are not likely capable of responding to other explanitory variables.

The Cadmus Report

The Cadmus report was well-written and much effort was given to explaining the statistical procedures, which was appreciated. I wholly concur with their conclusion that the overiding cause for the demise of the fisheries was overexploitation and the inability of the managing agencies to resolve the

...Page 7

problem. However, there certainly is evidence that the changes in water levels during the 1940's to 1960's (Fritz Johnson 1967) reduced the carrying capacity for walleye and northern pike in Rainy Lake. Maybe the fishing would have held up longer had the water levels of the 1940's been maintained.

I found the walleye life history information presented in the Cadmus report to have a slight American bias for several reasons, some of which follow: 1. Many female walleye reach maturity later than 2-6 years in Northern and Central Canada due to shorter growing seasons and lower productivity of many of our waters (See Colby and Nepszy 1981). Therefore, these northern populations are less able to compensate to exploitation pressures than would be suggested by age-maturity values given in the Cadmus report. 2. The Cadmus report cites Forney (1977) that walleye year class strength is not established until the second summer. The Oneida Lake case history is not typical because a major stocking program confounds the impact of natural reproduction in that system. Other investigators, Serns, etc., have shown that walleye year-classes are established by the fall of the first year and this is probably more the rule than the exception. However, because of the complexity and uncertainty surrounding the cause of strong and weak year- classes, we can't rule out that year-class strength in the border waters don't occur until after the first year of life. 3. The Cadmus report also mentions that yellow perch are the preferred food of the walleye and more recent studies in the Great Lakes indicate that this is not necessarily so. Walleye prefer soft-rayed fishes over spiny-rayed fishes (i.e. yellow perch) (See Colby et al 1991 and Knight and Vondracek 1993). The fact that perch are primary components of the diet of the walleye in the border water lakes is because they are more available or vulnerable to the walleye in those particular systems.

4. Page 17 - The Cadmus Group reports that the seining sites were beaches, where the predominant substrate type was sand, which is not a preferred habitat for YOY walleye (McMahon et al. 1984). The McMahon et al. 1984 report doesn't adequately describe juvenile walleye habitat, let alone that habitat in Canadian Shield lakes. In Northwestern Ontario, sandy beaches are prime juvenile walleye habitat. The McMahon index probably used U.S. habitat data which may differ significantly from our data due to their warmer climate. Similar sandy beaches in the U.S. may be too warm, or are occupied by too many predators.

Page 6 - As with Osborn et al. 1981, the Cadmus group concentrated on the data collected after the major rule curve changes in 1949. This removes much of the data used in Scidmore and Johnson's report (Figure 1) which provides strong evidence of water level effects on catch 4, 5, and 6 years later. This may explain why the Cadmus Group results were not definitive. Also, the latest rules reduced water level variance in Rainy River, eliminating potential detectable beneficial effects.

...Page 8

Page 37 - Negative coefficients for spring water levels in regression analyses may be due to cool, wet summers. Thus, are water levels due to natural phenomena more or less important than water levels that are regulated by the rule curve? Would regulated spring water levels under the newly proposed rule curve during warm summers provide the best spawning conditions possible?
Page 37 - I doubt that walleye are so cannibalistic on their own young in Rainy Lake that they influence adult abundance appreciably. More than likely, it is due to cool, wet springs. We should be looking at factors causing weak year-classes as well.
Page 39 - Northern pike are more cold-hardy than walleye and cold, wet springs may not have such a negative impact on them; but, the associated high water could benefit them.
Page 39 - Why analyze data from 1969 - 1981. The stock has collapsed and their abundance is too low to be responsive to the variables being tested.
Page 41 - Decreasing YMXR may increase walleye YOY (due to warmer springs??) and decrease northern pike YOY (low water level).
Page 21 -1952 - 1990 - analyzed data after the stock was in real trouble and becoming dependent on size of brood stock. The overpowering effect of exploitation on a declining stock would mask any effects that might result from water level differences, especially in Rainy Lake if the water level differences were not as great under the present rule curve regulations.
Page 22 - Correlations of water level with age several years later should not incorporate a constant lag time since the age structure of the walleye populations is becoming younger and growing faster. The lag time should thus be shorter during the latter part of the study. Note on page 24, the commercial catch of walleye was only weakly correlated ($r < 0.2$) with YMXR at a 5-year lag. However, there was a significant correlation with lake elevations after ice-out at a 3-year lag.
Page 26 - Why didn't they discuss black crappie-walleye interaction in Redgut Bay?

The Cadmus report is correct to suggest that walleye year-class strength is controlled by multiple variables and that these variables are also likely to vary between various ecosystems. The report doesn't refute that water level influences exist; but, only that they are difficult to demonstrate in light of other important factors, such as limitations of the data base. I believe Scidmore and Johnson provide convincing evidence that water level changes from those in the 1940's and 1950's reduced the carrying capacity for walleye in Rainy Lake. The associations are just to parallel (Figure 1). After that period, other factors such as the brook stock progeny relationships dominated with possible species interactions also operating (especially black crappie in Redgut Bay).

...Page 9

In their conclusions, the Cadmus report suggested that stocking of walleye fry and fingerlings in Rainy Lake could have influenced walleye recruitments. I doubt this very much because stocking of walleye fry and fingerlings on top of an already established adult walleye population rarely improves the fisheries (See Colby et al. 1979).

The Cadmus report did not refute the potential negative impact of winter drawdown of whitefish and cisco production. They did mention that other factors such as overexploitation and species interactions could also have been factors contributing to their decline, if there decline actually occurred. Because these coregonid fishes likely provide food for larger walleye and may be important in walleye production and yield, the Steering Committee may want to investigate what happens to coregonids during winter draw-down in other reservoirs.

The Cadmus report does not discuss the effect that present and proposed Rule Curves will have on the recovering sturgeon and walleye fisheries in the Rainy River System.

If you should have any questions or concerns regarding my comments, please don't hesitate to give me a call. If you have need or have difficulty finding reference material, please let me know.

Sincerely,

Peter J. Colby
Research Scientist
(807) 475-1670
PJC/clt
Encls.

c.c. Bev Ritchie

DEPARTMENT : NATURAL RESOURCES

STATE OF MINNESOTA

Office Memorandum

DATE : Mon Oct 4, 1993

TO : Rod Sando

FROM : Roger Holmes

PHONE : 297-1308

SUBJECT : Critique of the Boise Cascade Reports/Division Recommendations

I have enclosed the critiques of the Boise Cascade's fish and wildlife reports. Boise Cascade submitted several reports to the Rainy / Namakan Water Level International Steering Committee during the public review period of their draft report (July 1993). The Division of Fish and Wildlife has conducted an objective, scientific review and analysis of those reports (Cadmus Group, Inc. 1993 and Environmental Management Associates 1993). The critiques summarize the strengths and shortcomings of the reports, and this memo states the conclusion and consensus the Division of Fish and Wildlife has reached regarding the effects of water level management on the natural resources of Rainy Lake and Namakan Reservoir.

Careful review of the Cadmus Group's method revealed numerous unreasonable assumptions about the raw data, inappropriate analytical methods, and untenable conclusions. There are three serious flaws in the use of data in the Cadmus Report, which lead the investigators to unsubstantiated and likely erroneous conclusions. Those flaws include: the use of commercial catch data as an index of adult walleye abundance, the use of North Arm, Stanjikoming Bay, young-of-the-year (YOY) data as the dependent variable with South Arm independent variables, and the unreasonable treatment of Namakan Reservoir YOY seining data. These are serious flaws because the entire report then relied on these invalid assumptions about the raw data.

There appeared to be substantial agreement between the Environmental Management Associates (EMA) report, the original research reports, and our objective scientific assessment. However, in the conclusion of the EMA report, it appears as though they dismissed acknowledged negative impacts of the existing water level management regime on plant and animal species. The final conclusion of the EMA report that no scientifically convincing case has been made that a change in rule curves will noticeably affect wildlife is illogical.

The Boise reports do not met the definition of good science. They do not add to the accumulation of reliable knowledge; thus it should not affect the Department's support for the Rainy / Namakan Water Level International Steering Committee's Final Report and Recommendations.

We also conducted yet another extensive review of the Steering Committee's proposed rule curve and the associated supporting scientific literature and documents. We conclude that the literature and research supports the Steering Committee's recommendations; in that, the existing rule curves have a detrimental effect on the fisheries resource and the recommended changes will be beneficial to the Rainy Lake and Namakan Reservoir ecosystems. We believe the Steering Committee's Final Report and Recommendations adequately describe the Division of Fish and Wildlife views on the existing impacts and the benefits of change. Thus, we think it is appropriate to reflect on the Steering Committee process and on the Department's obligation to assist the Steering Committee in the IJC process.

The Steering Committee concept was initiated by our staff to advance the community effort (started by the Citizens' Council on Voyageurs National Park and Mr. F.R. Bokorney) to develop a scientifically sound water level management plan for the greatest number of people. It is an international committee made up of private citizens, government officials, and a Boise Cascade representative. Paul Radomski represented the interests of the Department and served as co-chair; Ken Wald was the Department's alternate member and assisted Paul in obtaining a Department perspective; Don Buckhout served as the professional facilitator. We have invested heavily into the Steering Committee's open process of comprehensive public consultation and oversight. But, it is the responsibility of this agency, for the people of Minnesota, to make such investments. Although the Steering Committee is only recommending modest changes when greater changes would more benefit the natural resources, it is our believe that the Steering Committee fulfilled the Department's vision statement:

We will work with the people of Minnesota to manage the state's diverse natural resources for a sustainable quality of life.

The Division of Fish and Wildlife recognizes the need to balance all interests (navigation, flood control, hydropower, shoreline property, tourism, upstream impacts, fish and wildlife, etc.), and it believes the Steering Committee Final Report and Recommendations represents the best effort to balance those interests.

Therefore, the Division of Fish and Wildlife strongly recommends that the Department actively and aggressively support this community process through the IJC process so that the Steering Committee's recommendations are realized.

c: Jack Skrypek
Paul Radomski
Ken Wald
Brian Stenquist

Review of the Cadmus Group, Inc. Report
Submitted to Boise Cascade June 17, 1993

The Frame of Reference for the Review

The research the Steering Committee cited in making its recommendations was scientifically refereed, the Boise Cascade reports should also be scientifically refereed. Science is "*an objective, logical and systematic method of analysis of phenomena, devised to permit the accumulation of reliable knowledge*" (Lastrucci 1963). We will assume that the Boise Cascade report was a honest attempt of an objective evaluation. The question, then, was whether it a logical and systematic method of analysis. Careful review of their method revealed numerous unreasonable assumptions about the raw data, inappropriate analytical methods, and untenable conclusions.

Strengths and Areas of Agreement

The report does a good job at summarizing the problems created by the existing water level management as viewed by the agencies responsible for natural resource management. The report provides a concise and accurate description of the life history of walleye and northern pike. In addition, the report does a fair job at highlighting research which has documented other variables affecting walleye recruitment besides water levels.

We concur with their speculation that overfishing was an important factor in the decline of some fish stocks in the area. For Minnesota waters of the South Arm of Rainy Lake, we documented overharvest as the primary factor causing the decline, and we continue to take steps to help restore this walleye fishery (Minnesota - Ontario Boundary Waters Fisheries Atlas 1992). Two controllable factors, exploitation and water level management, have been identified as affecting fisheries integrity. It has been stated that overharvest affects how long adult fish live, while water levels affect how many young fish enter the fishery. Many management techniques have been used to improve adult walleye survival and young walleye recruitment in Rainy Lake. For example, commercial fishermen accepted a buy-out offered by the Minnesota Legislature in 1985 (there is no longer any commercial harvest of walleye on the South Arm of Rainy Lake). A successful voluntary catch-and-release program sponsored and operated by the Rainy Lake Sportfishing Club began the process of reducing the recreational harvest of large fish. In addition, the Minnesota Department of Natural Resources and the Ontario Ministry of Natural Resources are currently addressing overharvest problems by initiating comprehensive regulation and management changes through a public process.

Shortcomings in their Analyses

There are three serious flaws in the use of data in the Cadmus Report, which lead the investigators to unsubstantiated and likely erroneous conclusions. Those flaws include: the use of commercial catch data as an index of adult walleye abundance, the use of North

Arm, Stanjikoming Bay, young-of-the-year (YOY) data as the dependent variable with South Arm independent variables, and the unreasonable treatment of Namakan Reservoir YOY seining data. These are serious flaws because the entire report then relied on these invalid assumptions about the raw data.

The investigators of the Cadmus Report assumed that commercial catch data was a surrogate for adult walleye and northern pike abundance; this is an illogical and an unsubstantiated assumption. It would be reasonable to assume that commercial catch-per-unit effort (CUE) is an index of walleye abundance (Peterman and Steer 1981; Bannerot and Austin 1983; Gulland 1983), but there is no reason to assume commercial catch itself would be. Chevalier (1977) suggested that commercial catch data may reflect an equivalent long-term downward trend in walleye abundance. We analyzed the commercial catch and commercial CUE series and found no significant linear correlation between the two for walleye in Rainy Lake. Therefore, the use of commercial catch data as an index of abundance is unfounded and illogical. In the scientific literature, Cohen and Radomski (1993) found that commercial catch and CUE series reflect each other in terms of frequencies and amplitudes, but they also found that they do not reflect each other in terms yearly fluctuations for both Rainy Lake and Namakan Reservoir. Since there is no relationship between annual catch and walleye abundance, one can conclude that the Cadmus Report models say nothing to the effects on the walleye population. It is doubtful that the models which incorporate environmental conditions would be applicable in the prediction of annual commercial catch (especially for Rainy Lake since walleye commercial operations no longer exist here). For example, in the past, the addition or substraction of a commercial netter or the change in effort by the netters had large impact on the annual catch. This is supported by the Cadmus Group's autocorrelation analysis. They found that the previous year's catch was the best predictor of the current year's catch (for both walleye and northern pike in both Rainy and Namakan Lakes; section 4.5.1). It is also interesting to note that in their cross-correlation analysis of Rainy Lake walleye commercial catch (see Table 4, page 25), the strongest positive correlation was with the same year catch of northern pike, and the strongest negative correlation was with the date of ice-out (an index of the length of open-water netting season). In conclusion, the reliance on commercial catch data only, and not commercial CUE data, in the multiple linear regression models results in spurious models on the effect of water level management.

Section 4.5.4 dealing with YOY and the conclusions drawn from that analysis are seriously flawed. The investigators used Rainy Lake and Namakan Reservoir seining data inappropriately. It appeared as though they ignored lake morphology and walleye stock identification or lacked the knowledge on these subjects. For Rainy Lake, they correlated YOY indices of abundance to disparate fish stocks. They used North Arm, Stanjikoming Bay, seining data with South Arm adult fish data. This is an unreasonable use of the data, since tagging studies by Bonde et al. (1961) concluded that these are separate populations. For Namakan Reservoir, although their methods are sketchy, it appeared as though they pooled data from Sand Point, Namakan and Kabetogama lakes for the period 1969 to 1990. We did not have data from each lake every year, and pooling data from these separate lakes, which have different productivities, would be unreasonable. We concluded that their correlations and models for predicting fish reproduction are erroneous.

Since we found serious fault with which data they selected to use and how they used those data, a thorough critique of the rest of the Cadmus Report would seem unwarranted. We did, however, have other kinds of comments relating to their method of analysis. Even if they had chosen the most appropriate data to analyze, the methods they chose (e.g. multiple linear regression) may not be the best analytical approach for time-series data and to predict the effects of proposed water level management changes.

Applications of standard regression methods to time-series is often inappropriate (Millard et al. 1985). Time-series data violate the basic assumptions of independence of observations. Thus, standard linear models can lead to incorrect interpretations (even if you used the most appropriate data). Standard linear models do not allow for population fluctuations. These models also do not allow for any of the dynamic behavior of population and habitat changes one observes in nature. Other investigators of water level impacts limited their use of standard linear models to correlate fish abundance with water levels; however, the Cadmus Report stretched the method to predict changes resulting from changes in water level management. We have serious concerns on their heavy reliance on multiple linear regression to predict what would happen if the rule curves were changed. Implicit in this technique is that the relationships between water levels and habitat will hold after a modification of a rule curve; this is unlikely. For example, the location where emergent and submergent vegetation grows will change as a result of changes to spring and summer water levels. Since, water level and fish habitat relations will change, water level and fish abundance linear relations will be different with different water level management strategies. In addition, standard linear methods are difficult to apply to time-series, particularly when lags are involved. To deal with these difficulties, time and frequency domain theory of time-series analysis was developed. Cohen et al. (1991) in their research applied a logical method for time-series data; they used spectral analysis. Other logical methods for these data would include multivariate time-series analyses.

Cohen and Radomski (1993) found cycles in fish populations and in annual water level fluctuations. They also showed that those cycles were similar; that is, they found significant correlations between cycles in the annual fluctuation of water levels and cycles in fish populations. In addition, they found water level regulation has affected both the amplitudes and frequencies of annual water level fluctuations. Lac La Croix and Rainy Lake had similar cycles in annual fluctuation, even though Lac La Croix is unregulated. Namakan Reservoir was different, perhaps because Namakan's dramatic drawdown. Water level regulation, through its effects on annual fluctuation, changed fish interactions in Rainy and Namakan lakes. They suggested that the fish community was more disturbed on Namakan Lake, and that this was due in part to water level regulation. Cohen and Radomski recommended, for the health of the native fish and wildlife, changes to the existing rule curves that would the natural cycles in the water level fluctuations. They concluded, as had Wilcox and Meeker (1991, 1992) in regard to the aquatic vegetation, that the water level management system should allow for year to year variability in water levels. For assuring adequate fish habitat, they recommended that annual water fluctuation cycles correspond to those of Lac La Croix.

The Cadmus Report states that the Steering Committee relied principally on the Cohen et al. (1991) recommendations. Therefore, they attempted to deal with water level annual

fluctuation data systematically. It appeared, however, that they had some difficulty using the spectral analysis technique and were unable to finish that analysis. It is quite evident from the Steering Committee's public review draft of the Final Report and Recommendations (1993) that they did not use the recommendations of the Cohen et al. (1991) report. Thus, the Cadmus Group's difficulties in this analysis is a moot point.

Shortcomings in their Conclusions

Since their analysis was so very seriously flawed, the conclusions of the Boise report (Cadmus Group, Inc. 1993) are unsound and erroneous. We also believe that section 5.0 could have been more balanced. The Cadmus Report could have focused better on how their results (i.e. their erroneous results) support, refute, or clarify the results in the literature. Their discussion instead focused on the refuting Kallemeyn (1987) and Cohen et al. (1991).

Conclusion of the Review and its Implications

The Boise report does not met the definition of good science (recall definition above). It does not add to the accumulation of reliable knowledge; thus it should not affect the Department's support for the Rainy / Namakan Water Level International Steering Committee's Final Report and Recommendations.

Review of the Environmental Management Associates Report
Submitted to Boise Cascade June, 1993

Areas of Agreement

The Environmental Management Associates (EMA) report was primarily a review of Voyageurs National Park commissioned studies. Several of those studies were published in the scientific literature, thus they have been evaluated by credible referees and editors of respected science journals.

There appeared to be substantial agreement between the EMA report, the original research reports, and our objective scientific assessment. The consultants concur with Thurber et al. (1991) that the large winter drawdowns in Kabetogama Lake negatively impact muskrats. They concur with Reiser (1988) that the existing water management system is responsible for destroying nests of loons and grebes. They concur with the Steering Committee assessment that their proposed rule curve changes would improve nesting conditions for loons and grebes on Rainy Lake and Namakan Reservoir. They concur with Kraft (1988) that benthic invertebrates (e.g. clams, mayflies, mussels) are negatively affected with the existing rule curves. They concur with the Steering Committee that environmental conditions for benthic invertebrates will improve with the proposed changes.

Shortcomings in their Conclusions

The consultants did not adequately address the long term impacts of the existing water level management versus the proposed water level management on the Common Loon and Red-necked Grebe populations. The consultants agreed that the proposed water level management would improve nesting conditions for these species, but they did not agree that this would positively impact nest success or overall numbers of birds.

We think that it is reasonable to expect that reducing the number of flooded nests, will decrease the number of renesting attempts. This will have a positive impact on loons and grebes on Rainy Lake and Namakan Reservoir. The process of courtship, egg laying, incubation, feeding and protecting young is very stressful, and it takes a lot of energy from the adults. Renesting increases the stress and energy requirements. This forces the adults to be raising young late in the summer when they should be improving their physical condition, in preparation for fall migration. All these factors have individual and population impacts.

The EMA report failed to adequately review the scientific literature. The existing literature on water level impacts to wildlife would have added insight into this issue and the research conducted on Rainy Lake and Namakan Reservoir. The most glaring error in the EMA report is its lack of breadth. It was difficult to understand why the authors so limited themselves to publications reporting on research done on the lakes in question. A thorough review would have referenced some of the rather extensive waterbird literature dealing with water level fluctuations. There are also vast literatures dealing with the

relationship between water level fluctuations and aquatic plants and invertebrates.

In the conclusion of the EMA report, the authors dismissed acknowledged negative impacts of the existing water level management regime on plant and animal species. The final conclusion of the EMA report that no scientifically convincing case has been made that a change in rule curves will noticeably affect wildlife is illogical.

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October 25, 1993

To: Ken Wald

From: Dave Ford

Comments on Boise Calibration/Sensitivity report

Differences between calibration and verification of models are summarized. The premise of verification is that the calibrated model is used with a simulation period independent of that used for the calibration and these simulation results are compared to to observed data. The difference between the observed data and the simulated results are used to judge the whether the verification is adequate for the user of the model. The adequacy of the verification is very much dependent on the how and for what purpose the model results are intented.

It describes differences in how SIMUL8 and the Flug model have been calibrated and suggests that the Flug method does not constitute calibration or verification. When a similar calibration technique is used with the SIMUL8 model near perfect simulation of historical levels is achieved (figs. 2.3 and 2.4).

The calibrated and verified SIMUL8 simulation of historic levels shows a reasonably good overall match of historical levels with the exception of extreme high and low levels. The model does a very good job of simulating the timing of reservoir rising and falling. Visual observation of Figures 2.5 and 2.6 indicate differences in simulated versus observed high range of Rainy levels of 0.2 to 0.5 foot occur frequently and greater than 0.5 foot occaissionally. The 1987 to 1992 period show consistently better fit than previous years. Overall the fit of simulated to recorded levels is better for Namakan than Rainy. Generally the model underestimates high levels and overestimates low levels.

The report describes the lack of detailed historical data with respect to specic day to day reservoir operations and with respect to configuration of the various flow contol structures within the system. And that the lack of this data is largely responsible for SIMUL8's inability to better match historic levels.

Figures 2.7 through 2.12 show SIMUL8's ability to simulate flood levels when the effects of these undocumented historic operational and structural details are factored out of the simulations. This was accomplished by using SIMUL8 to simulate individual flood events for the short term period when all system gates are wide open. The results of this simulation provides consistently better results than the long term simulations.

The sensitivity analysis shows how sensitive SIMUL8 is to variations in historical operational assumptions, to variations to inflow data and to variation in the accuracy of the results of algorithms used in the model. The sensitivity analysis results are displayed in terms of affect on the simulated cost of lost power production that would occur due to proposed rule curve adoption (Table 3.1) and in the difference in flood levels for existing and proposed rule curves (Table 3.2). The flood level comparisons are for simulated peaks occuring during 1966, 1968, 1974, 1977 and 1985.

Specific data in Table 3.2 which are likely most relevant to the needs of the steering committe include the following:

1. Variation in target elevation between upper and lower rule curves. The model incorporates the assumption for the base condition that the best representation of historic operation is to target the lake elevation which falls at the 75th percentile from the lower rule curve elevation to the upper rule curve elevation. The sensitivity of simulated peak flood levels when the target elevation assumption is varied to the 90th and 50th percentile are shown.

2. When perfect foreknowledge of the next 5 days of inflows are assumed as opposed to the base condition of estimating future inflows based on the trend of the previous 3 days. This begins to approximate what the system may be capable of should extensive flow and precipitation monitoring be employed in the lakes' watersheds.

3. When daily stoplog adjustments at Namakan are employed as opposed to the base condition of twice per week currently assumed to estimate past practice.

4. Combination of 2. and 3.

For all of the alternatives and years examined for sensitivity the following comparisons can be made:

1. How does the base condition Rainy or Namakan level change due to the implementation of the sensitivity alternative?

2. How does the difference with the base condition vary when the IJC rule curve is used compared to when the ISC proposed rule curve is used?

Of all the alternatives examined for sensitivity, excluding an overall reduction of inflows, the greatest reduction of peak levels is afforded by the "perfect knowledge of inflows for 5 days" alternative. The average reduction in flooding on Rainy over the five flood years is 0.15 foot with a range of 0.03 to 0.35 foot.

The results of the sensitivity analysis are that the examined alternatives do not result in significant level changes or reductions in flood peaks and that to substantially change peak levels under either the existing or the ISC proposed rule curve would require more significant operational or structural changes than those examined.

Additional thoughts:

Perhaps an analysis of flow travel time within the watersheds would show that travel times are substatially larger than the examined 5 days used in the perfect knowledge of inflows alternative. Should this be the case then perhaps more substantial reduction in flood levels could result from more intrensive gaging and monitoring in the watershed.

All of the previously reviewed analyses related to management of Rainy and Namakan levels have been based on constraints imposed by upper and lower rule curve limits. Improved gaging, level and flow monitoring and capabilities of flow control structure operations have come a long way since the rule curve concept was first implemented as a reservoir management tool. Perhaps infrequently occuring extremely wet or dry conditions in the watersheds and the resultant adverse effect on reservoir levels could be offset by allowing greater short term level management flexibility than the rule curves presently allow.

The most evident shortcoming of SIMUL8 is that it consistently underestimates high levels and overestimates low levels. It is noted in the report that all the reasons for this are not clear but the underestimation of high levels may be due to an overestimation of structure discharge capacities.

The report documents that of the two models, the SIMUL8 (Acres) model is better suited than the Flug model to represnt the interests of the steering committee.

A model that better suits the needs of the Steering Committee could be constructed. However to do so would require a significant expenditure of time and resources. It would still be limited by the lack of detailed historical information that limits SIMUL8. Although the results may better simulate peak flood levels, the overall results comparing levels resulting from operating under the IJC or the proposed ISC rule curves would likely not be significantly different.

DEPARTMENT: NATURAL RESOURCES
Division of Waters

STATE OF MINNESOTA
Office Memorandum

DATE: September 13, 1993

TO: Dave Ford DRF

FROM: Dave Leuthe DL

PHONE: 297-3886

SUBJECT: Comments on Rainy-Namakan Assessment of Flood Damage Report, Acres International Limited

I have reviewed this report and offer the following conclusions:

The report offers a comprehensive identification of the factors and unit costs to be considered in evaluating the costs of flood damage.

It objectively compares associated costs with both the existing and proposed rule curves.

It extrapolates impacts for the entire system based on interviews with approximately 50 property owners but does not provide evidence that this correlation is justified.

The interviews appear to be a mix of qualitative information (opinions) and some quantitative information (structure elevations).

The hydrologic modelling used is subject to greater potential inaccuracies when attempting to predict higher flood events.

Use of historic data earlier than 1958 introduces greater error potential in predicting flood damage potential as the data is less accurate/reliable. Approximately 92% of the predicted increased damage potential occurs prior to 1958. Approximately 64% of the predicted increased damage potential occurred as a result of the highest flood (1950).

Section 3.2 of the report reaches this conclusion: "The general opinion of the majority of those interviewed centered around:

-concerns on the Namakan Lake system about low spring water levels in the past and optimism that increasing these levels under the proposed system would be of significant benefit, both to fish habitat and access to docks.

-acknowledgement, but only minor concern, about potential increasesin flood damages due to intermittent high levels in spring and early summer. The general feeling was that intermittent flood damages would be much more than offset by the annual improvement in water levels in spring."

In Section 4 (p 15-16) I find that they acknowledge the validity of many of the same concerns that I found in the earlier part of the document. They also appear to concede that the increased flood potential is not a major factor in the overall balancing of benefits and costs.

In conclusion, the report provides a raw estimate of flood damage potential if one can accept all the conclusions drawn. Better elevation or flood prediction information could increase or decrease the damage estimate. Both the existing and proposed rule curves provide some benefits in reducing flooding impacts. Affected property owners concerns about flooding should not be discounted, but do need to be balanced in with the greater goals. If the property owners interviewed are a representative sample of concerns, it appears that they may be willing to accept a slight increase in flooding risk in exchange for improved spring levels and potential improvements in fish habitat.

Ontario
Ministry of Natural Resources
Ministère des Richesses naturelles

July 29, 1993

MEMORANDUM TO: William R. Darby
Area Supervisor
Rainy Lake Area
Fort Frances District

SUBJECT: Rainy and Namakan Lake Level Study

In response to your letter of June 7, 1993, addressed to Mr. Maurice Lewis, former Director of Engineering Branch, we have reviewed the two hydrologic modelling reports (Marshall Flug, April 1986 and Acres International Limited, March 1993) and your Committee's Draft Final Report and Recommendations dated June 11, 1993. We summarize below our comments in the order of concerns you have raised, and you may wish to refer to the attachment for details:

1. Strengths and weaknesses of each hydrological evaluation

One of the major differences, hence the relative strength/weakness, between the two modelling approaches is in the simulation time steps. Flug uses monthly (or more accurately, quasi-monthly) time steps, and Acres daily steps, the latter is expected to give better results. We concur with the Committee's decision in giving more weight to Acres' report than Flug's.

In both reports, because of the averaging in both lake level and inflow/outflow estimations, the simulations tend to damp out the actual lake level fluctuations, as exemplified by Figure 6 in Acres' Report.

Acres' model tends to follow rule curves more accurately than could be expected, the implications being that the actual lake levels will sometimes have a larger range than that indicated by the rule curves.

In reservoir operations, given the inherent uncertainty with inflow forecasts, it is prudent to over-shoot or over-fill the lakes sooner than the prescribed spring dates and then gradually drawdown the lakes to their early summer levels. Otherwise, there always exists a slight chance that the lakes may not be replenished to their upper rule curves when the spring freshet is over.

We also note that both reports ignore the evaporation loss from the lakes. Although Acres' reasoning for ignoring the evaporation loss may be acceptable, it would have been relatively easy to include an evaporation term in their simulation, thus increasing the comfort level among the users.

2. Strengths and weaknesses of the models apparent from the reports

Flug's model is an optimization one, and Acres' SIMUL8 a simulation one.

It is worth noting that another Acres' model called Acres Reservoir Simulation Program (ARSP) is very similar to Flug's in that both use the concept of penalty or priority functions and an out-of-kilter optimization algorithm to minimize the penalty for a given time step (see Flug's report, page 24).

As a general rule, optimization models tend to be used for planning studies, and simulation models for operations.

3. Any shortcomings in the Steering Committee's interpretation of the model outputs

The proposed rule curves represent, in the case of Namakan Lake, a narrowing of operating zones from the present rules. For both Namakan and Rainy Lakes, they reflect some time shifts in the filling and emptying of the reservoirs.

The Committee's interpretation appears sound, and it agrees intuitively with any negative impacts one might expect from such changes to the existing operating policy, ie., loss in energy production, increase of incidents in both exceeding the spring flood levels, and under-filling the late summer lake levels.

We concur with Acres' recommendation that an assessment of potential flood damages to lakeshore properties be carried out to quantify the higher flood risks due to the proposed changes in the rule curves.

A detailed review of the proposed rule curves is given in the attachment.

We have been in touch with Mr. Dave Leuthe of Minnesota DNR, and would like to inform you that both his and our modelling groups have reached essentially the same conclusions independent of each other. In addition, we were informed by Mr. Leuthe that Acres had issued on July 9, 1992 a report on the calibration and sensitivity study of SIMUL8 model. Should you require assistance in conducting additional review, please contact Gail Beggs, Director, Aquatic Ecosystems Branch, who now has the responsibility over water modelling.

We trust the above address the concerns you have. Should you wish clarifications of these or other matters, please do not hesitate to contact John Ding in Toronto (Telephone 416/314-2394).

Maurice G. Lewis, P.Eng.
Corporate Services Division
Room 5620, Whitney Block
Toronto

JYD/
Attachment

cc: Dave Leuthe, Minnesota Dept. of Natural Resources, St. Paul
Bruce Adamson, Regional Engineer, Thunder Bay
Gail Beggs, Director, Aquatic Ecosystems Branch
Jim Gosnell, Manager, WS & H Section, Aquatic Ecosystems Br.
John Kinkead, Manager, WM & CA Section, Aquatic Ecosystems Br.
Remo Bucci, Engineer, WS & H Section, Aquatic Ecosystems Br.
Ian Cameron, Engineer, WM & CA Section, Aquatic Ecosystems Br.

ONTARIO MINISTRY OF NATURAL RESOURCES

Date: July 16, 1993

To: John Ding, P.Eng

From: Ian Cameron, P.Eng
Remo Bucci, P.Eng

RE: RAINY LAKE AND NAMAKAN RESERVOIR RULE CURVE ANALYSIS

Generally:

1) There are two major problems encountered with the proposed rule curves. There is a significant increase in spring flood events, and the summer drawdown results in significant loss of hydropower production. The first of these, spring flood events, are only mentioned in the Steering Committee report as "flood events may increase" whereas summer/fall high water events are "expected to decrease". A conclusion, about spring highwater events, states "may marginally increase the number of high water events." The Acres report was concerned with the potential flooding increase in the spring, and this was not reflected in the Steering Committee report. Indeed the biggest opposition to the new operating curves (22%) is spring flooding.

   Reference is made to improved inflow forecasting to minimize spring flood events by closely monitoring gauges at the upstream lakes (ie. Lac La Croix). More information (and perhaps more thought) must be provided on the exact mechanisms. Furthermore, when one compares the simulation of the IJC rule curves to the historical data it can be seen that the model tends to flatten out the data on the peaks. In actuality more violations of the rule curve should be expected than predicted by the simulation.

   Acres had recommended that a flood damage assessment be completed to provide a better estimate of the actual extent of spring flooding as a result of the proposed rule curve. This analysis is critical and should be done before the proposed rule curve is enforced.

2) The drawdown is much too high with the existing rule curve for Namakan Reservoir. The model indicates that the proposed curves rectify this. When one compares the simulation of the IJC rule curves to the historical data it can be seen that the model tends to not bring the winter drawdown, down as much. In practice the winter drawdown may be greater than the simulation indicates for the new rule curves.

3) For Rainy lake the new rule curves don't make it clear as to summer/fall navigation because the lower curve drops below 1107 ft the second week of July! What is the critical level? This represents a possible conflict in the report (ie. we need navigation in the spring but we'll dredge for summer navigation.)

4) Consideration should not be given to the Flug model for the prediction of floods. The committee says they are going with Acres to err on the side of caution and but don't implement all recommendations. They also say that the additional spring time floods that are predicted but only may occur will not happen if conditions of forecasting and response are improved. **However, improved forecasting and response are recommended but need to be more specific. Examination of the results show that springtime floods will be more frequent than predicted.**

5) Ice damage could be better addressed. On Namakan Reservoir the proposed rule curve will bring winter levels up by about two feet. Can this be achieved given the lakes ice forming characteristics (ie. anchor ice - breakup is May 7 approx.)

6) Damage to archaeological Resources in the spring floods was overlooked. It was only considered for summer/fall floods.

7) Is water quality expected to decrease/increase in the reservoirs? This is unclear. If there is a change in the water quality in Rainy Lake and Namakan Reservoir, what will be the downstream effect ?

Acres (SIMUL8) Model:

1) Overall we have every confidence that this model is capable of providing the required information to evaluate the change in rule curve. We have more trouble with the way in which the final report ignores the possible flooding results. We do have a few problems with the Acres model.

2) Page 4-4 lists assumptions that lead to inaccuracies in the power generation model calculations in excess of 10%. These errors are dismissed because both models experience the same errors. This would only be valid if the errors were linear with respect to water flow, and they aren't.

3) The Acres report provides plots of simulated effects on Lake of the Woods vs historical record, showing the levels to be consistently higher, but no analysis of this is provided.

4) No plot is provided of simulated IJC rule curve vs historical. This would allow for a more reasonable comparison of the simulated rule curve vs historical and simulated rule curve vs IJC rule curve plots. When one overlays the IJC simulation with the historical it is clear that the Acres model keeps much closer to the rule curves than the dam operators! The Acres model can be trusted to provide highly accurate comparison of different rule curves. It does not however well reflect the variance experienced in water levels in practical application of the rule curves. This means that power loss figures are greater than estimated and flood events will be more frequent and extreme.

Flug (CSU) Model:

1) This model is not suitable for detailed analysis. Dams are operated on a weekly or more frequent basis. The data used in this model consists of a 3 day period per month (last two and first day), to represent monthly reading. Data taken on this basis is not meaningful. They could have broken the year into twenty periods and averaged in the day before and after every 18th day or some such method. They could have looked at monthly maximums, means and minimums, and also taken monthly volumes into account.

The reason for studying rule curves is two fold:

To determine mass balance and evaluate operating procedures to see how frequently the system will have insufficient water to meet the rule curve minimum, and too much water to contain the rule curve maximum;

To evaluate cost benefit analysis for power generation, flood damages, navigation and habitat, etc.

2) There is no way, with the given data, that the Flug model can determine from day to day that the rule curve can be met. Therefore the report we were provided with does not deal with power generation, flood damages, navigation and habitat adequately. The model is calibrated by using the historical record for target levels on a month end basis. Then it uses rule curves as its targets with the calibrated parameters. Month end targets cannot be calculated reliably without considering the remainder of the month.

3) The power generation calculations make far too many assumptions. They also get caught up in the argument that errors for one simulation run cancel out errors for another.

DEPARTMENT: NATURAL RESOURCES
Division of Waters

STATE OF MINNESOTA
Office Memorandum

DATE: June 7, 1993

TO: Paul Radomski, Co-Chair
International Steering Committee

FROM: David R. Ford DRF
Surface Water Engineer

PHONE: 296-0437

SUBJECT: HYDROLOGIC MODELING & MANAGEMENT ASSUMPTIONS, BOISE CASCADE, RAINY/NAMAKAN LAKES

We received your request from the International Steering Committee (ISC) to perform an objective analysis of the adequacy of hydrologic simulations in predicting extreme (high and low) events. We are providing comments on the quality of the actual model and application of management assumptions, plus some additional observations about the process before you.

Our initial reaction was to broaden the scope of the review to improve the chance that the modeling effort could be used as an objective tool by all parties. We felt that a coordinated review of the hydrologic models with the other major stakeholders was and is the appropriate course of action. The IJC, Rainy Board of Water Control, Environment Canada, the Ontario Ministry, MNDNR, Boise Cascade, Border Lakes Association and all other interest groups have a stake in the acceptance and potential use of a hydrologic tool in attempting to balance requests for changes in the rule curve.

We made preliminary inquiries with IJC/Water Control Board staff regarding possible coordination on review of the model. We found however, that the formality of the IJC process and the impending time deadlines precluded a cooperative review for the present. We then proceeded with our normal review.

We performed this review based on written materials, telephone conversations and graphical information obtained from Boise Cascade, their consultant (Acres) and the ISC. The reports that we reviewed did not discuss the adjustments made to the model since July 1992. An appendix is attached to provide clarification on a few designated (*) points that we make.

Model Analysis

Based on the information contained in the report by Acres, for Boise Cascade, dated February of 1993 the modelling principles and predictive methods used, appear to be sound. However, there are certain additional areas that require further discussion and possible modification by Boise Cascade and its consultant in order for us to have a reasonable level of confidence in the model's predictive capabilities.

Your concern about the difference between the number of high water events predicted between Marshall Flug's NPS model and the Acres model has a probable explanation: Flug's model used monthly values. Monthly values can easily mask shorter term peaks because it averages all the daily values into one value for the month. The Acres model uses daily values and gives a better estimation of shorter term events.

Acres has done significant work to improve understanding of water management in the Rainy/Namakan watershed. There efforts have resulted in a model that does a reasonably good job for its intended purpose: optimization of hydropower. The model was not designed to be used as an optimization model for all interests and would need significant modifications and additional data inputs before it could be effectively used that way. We offer our assessment of the benefits and limitations:

Benefits:

-Daily time step.
-Very good for understanding hydropower optimization needs.
-Some value for relative comparison of rule curves options.

Limitations:

-Inflows are estimated and smoothed by averaging.
-Accuracy in predicting extreme levels for historical events is limited by available data.
*Headwater and tailwater prediction errors (up to 10%).

Even the most comprehensive model will be limited if there is a lack of actual or applicable measured data.

Comparison Concerns

Some of model results that are presented do not give the reader an appreciation of representative conditions. These incomplete representations can be misleading to all but those who are knowledgeable on the specific subject. Full disclosure is important if these results are to be objectively used. Some examples are:

*Comparison of simulated levels to historic levels was not done using existing rule curves. Of special concern is equitable comparison of flood potential. Specifically, the association between historical flooding and potential flooding under proposed rule curve was done, but no association between historical flooding and potential flooding under the existing rule curve was provided.

*Use of 1977 as a typical year (Page 5-1, Figure 6).

Management and Operational Assumptions

We would also like to point out some additional factors that need to be considered in addition to review of the model:

*Boise Cascade's FERC license requires run-of-river operation of the dam yet Boise indicates that it uses a peaking strategy.

*Changes in current operational practices could be considered to attempt to reduce the impacts on flooding (e.g. estimation procedures for future inflow, use of upper portion of the rule curve as the optimum target level and dam adjustment restrictions). We do note however, that this may be at the expense of other efficiencies.

Improved management of the system through improved modeling, and watershed monitoring should be considered. It is hypothetically possible that flooding could be reduced, water levels improved for fish and wildlife and impacts to hydropower minimized by developing a more comprehensive watershed monitoring system and modelling effort.

Summary

The Acres model is useful for understanding hydropower needs. It also can be used for limited comparison purposes of different rule curves. It, however, has limitations in flood predictions and should not be viewed as an ideal tool on which final decisions should be based. Additional coordinated review may improve the usefulness and acceptance of the model for use in interest balancing through direct coordination and discussion with all interested parties.

It is our observation that both of the primary studies (Cohen's fishery and Boise's hydrologic) involved in this rule curve evaluation, lack full understanding and acceptance by all the major stakeholders. Boise is seeking independent evaluation of the Cohen study and the ISC is doing the same for Boise's hydrologic simulation. Boise is also engaged in making public presentations using results of their model outside of the ISC in promoting their point of view. If normal tendencies hold true, we will soon see

polarization and a variety of conflicting opinions that become entrenched.

More coordination is obviously needed by both sides. The work that is currently being focused on diverging efforts should, if at all possible, be focused towards a common goal. Time and money on additional studies will be largely wasted unless all agree to the scope and parameters of the studies and believe the researchers will produce objective results. Lack of coordination will merely result in a proliferation of technical studies, each designed to refute evidence in previous studies.

The IJC may be needed to commence this type of coordinated effort. As long as any party believes that the IJC may rule in their favor based on their technical data, they will be unwilling to truly bargain in good faith. Agreement on the facts does not preclude each party from strongly representing their interests. Agreement on the facts will however, increase the likelihood that all parties will be able to accept an objective IJC decision.

cc: Kent Lokkesmoe
Dan Retka
John Adams
Amy Loiselle
Mike Romslo, Boise Cascade
Rick Carson, Acres

APPENDIX

RAINY - NAMAKAN LAKE HYDROPOWER./LAKE LEVEL MODEL REVIEW

Based on the information contained in the report by Acres Wardrop for Boise Cascade dated February of 1993 the assumptions and predictive methods used in the model appear to be sound. The following details areas of concern or areas requiring further explanation.

Headwater and Tailwater Predictions

Page 4-4 of the report describes the degree of error associated with headwater predictions to be as high as 10 percent (0.75 feet) in some instances. This degree of error in predicting the headwater may be significant if it occurs on a frequent basis and the tendency is for a constant over or under prediction. If this headwater error is significant it would have a direct impact on the head and the associated power produced. Therefore some statistical information detailing the frequency and magnitude of the error associated with the headwater predictions would be helpful.

Page 4-5 states that a best fit of tailwater, plant flow records and flow information from the Little Fork and Big Fork Rivers was used in predicting tailwater. What is the relative accuracy of these predictions? (i.e. R2, standard error, 95% confidence interval).

Modeled Output Comparisons

Page 5-1 describes a comparison of modeled lake levels with actual lake levels for 1977 (see figure 6). The report states that the year 1977 reflects a typical year during the modeled period. If we assume 1977 is representative of the modeled period, then it appears that the model under predicts high water level conditions and over predicts low water conditions for Rainy Lake. However, flow information for the USGS gage on the Rainy River near Manitou Rapids (#05133500) indicates the year 1977 does not reflect an average year. For the period of record examined (1928-1983) runoff was the lowest on record during 1977 and is more representative of extremely low, stable, base flow conditions. Further comparisons should be performed between historical lake levels and modeled lake levels so that a meaningful comparison of the models predictive capabilities can be achieved for a variety of flow conditions.

The report indicates a comprehensive comparison of historic levels to modeled levels was not done because of changes in the rule curve and plant operations and physical modifications to the dams, (see page 5-1 for further explanation), which are not accounted for in the model and limits the accuracy which can be expected from the model.

A comparison of predicted vs. actual lake levels for an extended period of record is necessary for two reasons. The first and most obvious is to provide a measurement of modeling accuracy and confidence. Secondly, it will allow a direct comparison of past

historical flooding using Boise Cascade's modified/current operations under the existing IJC rule curves and that of the proposed Steering Committee rule curves.

To illustrate the need for a direct comparison of historic and modeled lake levels and the associated flood risks we examined Figure 7, 8, 9, and 10. Figures 7 and 8 compare the modeled lake levels under the existing IJC rule curves to the proposed Steering Committee rule curves for Rainy and Namakan Lakes. Boise Cascade also compared the modeled lake levels using the Steering Committee rule curves with historic lake levels (Fig. 9 and 10). There is no comparison in the report of modeled lake levels using the existing IJC rule curve to historic lake levels. It is important that they also be able to make comparative association to modeled output for existing rule curve operations.

Increased flood potential is a serious concern of certain interests in revising the rule curves. A duration assessment of flooding was done for modeled operations using both the IJC and Steering Committee rule curves. However, as previously stated a duration assessment and frequency analysis of historical lake levels to determine historical flooding characteristics was not done. This association between historical flooding and potential flooding based on the modeled existing and proposed rule curves must be done. Whether the model reflects past operations is secondary. The interests concerned with increased flood potential are making an association between historical flooding, model output and any proposed rule curve changes.

From the graphs in the above mentioned figures we visually identified a number of years where at least one day of flooding occurred historically, under the modeled existing IJC rule curves and the modeled Steering Committee rule curves for each of the 36 years of continuous record (see table). Note that because some daily tabular data was not available we could not make a comparison of the frequency of occurrence for a given year or the duration (number of consecutive days) of the flooding events for all three scenarios.

Number of Years Flooding Occurred (1957-1992) and Percent of Total Yearly Record

	Rainy		Namakan	
Historic Record	26	(72%)	23	(64%)
Modeled IJC Curves	12	(36%)	17	(47%)
Modeled Steering Committee Curves	9	(25%)	15	(41%)

The table indicates that historical flooding occurs quite frequently based on the period of record under past operations.This table also indicates that even with modifications to the existing IJC rule curves as proposed by the Steering Committee, flooding from an annual occurrence perspective will be much less than historic. A more extensive analysis of the historic daily records would provide a thorough comparison of modeled output using the two rule curves and current operations and historic flood frequency.

Management and Operational Assumptions

The report indicates that the model is based on the current operations it uses to maximize power production within the existing rule curves. From our review it appears that these operational parameters may be too restrictive to allow reaction to rapid changes in flow and lake levels particularly during spring break up and summer/fall storm events. These parameters include:

1. Changes in the Kettle Falls dam (Namakan Lake) outflow is assumed to be on a 3.5 day basis.

2. Predictions of the next 5 days inflow is based on the previous 3 days inflow.

3. Targeting the upper portion of the rule curve is assumed as the optimum lake level and is the goal during each daily outflow simulation.

Page 4-8 states that water is shared between the U.S. and Canadian hydro facilities equally except during week days when flows are below maximum turbine capacity, at which time the Canadian plant runs in a peaking mode and the U.S. facility reduces output to allow power maximization on the Canadian side. Because the Canadian plant has a financial incentive to run in a peaking mode Boise Cascade proposes to use this operational scheme in the future.

The FERC license (FERC #5223) issued to the U.S. hydro facility clearly states that it is a run of river facility and as such must operate in a run of river manner. As previously stated, in order for the Canadian plant to capitalize on peaking incentives during lower flow conditions the U.S. plant must reduce its output. According to the report it appears that the financial benefits of peaking operations are reflected in the model output for both rule curves. This is significant in that the IJC rule curves allow greater flexibility for power production over that of the proposed curves, particularly when there is an incentive to peak.

Additionally, the model output developed from the IJC rule curves which incorporates the above mentioned peaking strategy is used as the baseline for comparison purposes. In other words, the estimated annual average loss of $340,000 to Boise Cascade if the proposed Steering Committee rule curves are initiated is based on a power maximization operational strategy that appears tobe contrary to the licensed operations.

Summary

Based on the information contained in the report the assumptions and predictive methods used in the model appear to be sound. However, in order for the Department to be confident in the results produced by Boise Cascade's reservoir model, additional information should be provided:

- Statistical information detailing the relative accuracy of headwater and tailwater prediction incorporated into the model.

- Frequency and duration analyses of historic flooding based on daily information and a comparison with modeled results using the existing IJC rule curves and the proposed Steering Committee rule curves as specified in Tables 3 -10.

- Comparison of actual mean daily lake levels vs. model predicted lake levels for an extended period (1957-present) that reflect current operating practices incorporated into the model. The appropriate statistical information should also be included.

The peaking functions of actual operations provide financial benefits to Boise Cascade, and are simulated in the model for comparing the existing IJC rule curves, and the Steering Committee rules curves. Peaking parameters using the U.S. plant flows are inconsistent with the FERC licensed operations for this facility. Therefore monetary comparisons of the different rule curves should be viewed cautiously since they may not represent approved operational conditions.

- Due to the extent of the historic flooding documented in the report, the current operations may be too restrictive in respect to the frequency of changes in operations, the estimation procedures for future inflow, and the targeting the upper portion of the rule curve. Boise Cascade should consider revising the operational procedures as described in the model in order to be more responsive to rapidly changing conditions associated with spring break up and summer/fall storm events.