HB

684

BILL SHEFFIELD
GOVERNOR

STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

February 13, 1984

The Honorable Joe Hayes
Alaska House of Representatives
Pouch V
Juneau, AK 99811

Dear Representative Hayes:

Under the authority of art. III, sec. 18, of the Alaska Constitution, I am transmitting a bill making a special appropriation to the Alaska Power Authority. This special appropriation is for rate stabilization for the utilities that will be purchasing power from the Lake Tyee, Swan Lake, Terror Lake, and Solomon Gulch hydroelectric facilities. The money will be used to reduce the wholesale power rate for these utilities during the early years of the operation of the hydroelectric facilities when hydroelectric costs will be significantly higher than their projected costs for diesel generation.

At the current stage of negotiations on the power sales agreements the rate stabilization fund is treated as a grant, and the special appropriation bill reflects this approach. However, the authority is still looking at the possibility of funding rate stabilization with a loan rather than a grant. If the loan approach is used, an amendment to this bill will be proposed to reflect the change.

Sincerely,

Bill Sheffield
Governor

LEGISLATIVE BRIEFING
LABOR AND COMMERCE COMMITTEES
PROPOSED RATE STABILIZATION FUND

A major issue involved with the establishment of the Energy Program for Alaska's Four Project Pool is the cost of power in the early years of operation. As is often the case with hydropower projects, the high fixed cost of bringing the projects on-line combined with relatively low utilization in the early years and lower than expected costs of operating diesel units has meant that the cost of power will exceed that of existing diesel generation. The Alaska Power Authority has, therefore, suggested a Rate Stabilization Plan that would provide an entry rate competitive with existing generation, protect the communities from rate shock, and allow the communities access to hydropower until the project's capacity is utilized enough to make it more desirable than diesel generation.

The power sales agreements proposed to the communities involved in the Four Project Pool recognize that the full power cost of the Power Authority's hydroelectric project will initially exceed that of the purchasing utilities' existing generation. This situation is likely to continue for several years until the increased usage of hydroelectric power brings its unit cost down and the unit cost of diesel generation, including the cost of additional generating capacity increases. The attached graph illustrates this relationship. It shows, in concept, the average unit revenue requirements with and without the hydroelectric projects. The average unit revenue requirement represents the total costs projected to be paid by the utility from sales revenue in each year divided by the forecasted sales of electricity. In the long run this approximates the average rate per unit of electricity sold to each type of customer including commercial, industrial, and residential.

The intent of the Rate Stabilization Fund is to offset the higher costs of the hydroelectric projects in these early years in amounts equivalent to the costs avoided by not operating diesel generation. The amount of the Fund is represented by the shaded area on the graph. The amount initially deposited in the Fund and the annual amounts withdrawn from the Fund to offset each utility's power costs from the Power Authority are established in advance and the power sales agreement will be conditional upon the establishment of the Fund. The calculations to determine the size of the Fund and the schedule of payments are detailed and complex. They rely on large amounts of data and numerous assumptions and involve analytical models that have been developed over the last several months with the purchasing utilities.

In general, the methodology involves projecting each utilities' costs with and without the hydroelectric projects and determining the difference. The costs without the projects include diesel fuel, operation and maintenance costs, major repairs and overhauls, and additions or replacements of generating capacity. By purchasing power from the Power Authority, the utilities can avoid some or all of the costs associated with these items. If the amount paid for power from the Power Authority is equal to the avoided cost of diesel, then the resulting costs to the ratepayers is no greater than it would otherwise have been. Once the avoided cost of diesel exceeds the fully allocated costs of Power Authority power, there is no further need for rate stabilization payments. The point at which this occurs is generally referred to as the "cross-over point." At the cross-over

point power costs tend to stabilize as the slight increases in the operating costs of the hydroelectric projects are off-set by increasing power sales.

The amount in the Rate Stabilization Fund needs to be carefully considered as well as the variables that will effect it. The amount is approximately $61.5 million consisting of $35 million in a State grant, $12 million from the bond proceeds, and about $14.5 million in interest earned on the $47 million invested during the approximately eight years that the Fund would be needed. These funds would be held by the Bond Trustee, not the communities, and each utility would take annual credits that would be necessary to stabilize their rates. Each utility would have a specific, maximum amount which could be drawn from the fund. While this amount could not be exceeded, the utility could elect not to take the entire annual amount and the remainder would be held in the Rate Stabilization account and reinvested. In this way, the utility could use the excess money to provide for future rate shock insurance.

Due to provision in House Bill 9 (HB 9), an amendment to the Energy Program for Alaska which established the pooled debt concept, there is the possibility of return on the State's investment to these four projects. Because of the "system increment" mechanism imposed by HB 9, when a new project is introduced to the Energy Program, the debt service on that project is pooled with the projects already in the system. The projects then continue to pay on the pooled debt at their established proportionate share. System increments, however pose problems for rate stability if a heavily debt financed project enters the system. As part of the proposed power sales agreements, the Power Authority is proposing a "cap" on the amount that rates can be raised due to a system increment. (See attached graph.) This will provide protection for the Four Project Pool utilities from future rate shock due new projects being brought into the system while at the same time it will return a portion of the State's investment in these four facilities.

684
S29

Alaska Power Authority
Commissioner: D Lyon
Executive Director: Lary Crawford

Board meeting, 22 February 1984

Power Sales agreements;

1. Copper Valley: close to an agreement. Jim Billingame, manager of utilitiesstates that he shows some concern of confronting his public with a cost not seen before. Presently Glennallen diesel generation is .06 PKH and proposed APA power will be .07 PKW. This constitutes a 40% increase to some. Valdez is an emphatic NO! Average monthly consumption in Glennallen is 340 KWH and translates to $90 per month, while Valdez is running an average monthly bill of 550 KWH or $151. per month. A 40% increase can be devastating.

2. Wrangell: Matt Cole (position unknown) will be taking power sales agreement to city council Thursday night (Feb 23rd) for consideration. He says discussion (informal) with council members appears good and contract may be forthcoming.

3. Kodiak: David Neese, Mgr of Muni-power. Municipality has agreed to purchase power from APA. Two suggestions: possible loans to consumers and the establishment of an advisory board.

4. Ketchikan: Rick -?--. mgr of utilities says it looks very good, contract in the making with questions as to wording of legal documents.

5. Petersburg: NO!

Management study (status report) presented by Roger McMannus of Mead consultants for FY 84, FY 85, FY 86.

Presently APA employes 69 persons

Executive Dept----------4
Planning ---------- 9
Projects ----------18
Operations ---------- 7
Finance-Administration ---31

APA is asking for an immediate increase of 16, 17 more FY 85, and an additional 9 for FY 86 to total 111 persons.

1984 Susitna contingency fund: 3.18 Million dollars
Drilling request (wantana dam) 1.9 million. if approved this will leave in the contingency fund 1.28 million.

Competitive bidding on Watana Dam drilling will be let 27 Feb 84 with awarding of contract sometime in mid April 84.

ALASKA STATE LEGISLATURE
HOUSE OF REPRESENTATIVES
RESEARCH AGENCY

Pouch Y, State Capitol
Juneau, Alaska 99811
(907) 465-3991

May 26, 1983

MEMORANDUM

TO: Representative Ron Wendte

FROM: Jack Kreinheder
Research Staff

RE: Power Rates for Alaska Power Authority Projects
Research Request 83-182

Suzanne Mullen of your staff requested that we review and summarize the power rate analysis provided to you by the Alaska Power Authority. This analysis compared power rates for the four projects now completed or under construction -- Solomon Gulch, Swan Lake, Terror Lake, and Tyee Lake -- under the following cases or scenarios:

- a base case, with all four projects under the current rate structure established by HB 9, and minimum expected power sales.
- power sales for Swan Lake assumed to increase to 90 percent of project capacity, with remaining assumptions identical to the base case.
- a "stand alone" case, in which all four projects are separated and responsible for the payment of their own debt service. Under the current system, debt service is pooled for the four projects.
- a stand alone case identical to the one just described, except that all projects are assumed to be fully utilized (all power sold). Swan Lake was assumed to be 90 percent utilized.

General Comments

In general, the rate calculations provided by the Power Authority appear to be accurate for the cases specified. Some of the power sales figures in the base case do differ slightly from earlier estimates provided by the Power Authority, but the differences are not major. However, the rate tables which were provided to you do not match all of the cases described in the cover letter. For example, the cover letter states that the analysis includes a case for Terror Lake, Swan Lake and Solomon Gulch under the current HB 9 rate system (Tyee excluded), and a case

for Terror Lake and Solomon Gulch (Tyee and Swan Lake excluded). However, neither of these two cases were included in the tables I reviewed. The only similar case was one for Terror Lake, Solomon Gulch, and Tyee Lake, with Swan Lake excluded from the system.

If you specifically requested these two cases from the Power Authority, you may wish to inform the Authority staff that the correct rate analysis was not provided for these cases.

Comparison of Rate Scenarios

The attached graph and table provide a summary comparison of wholesale power rates in FY 1986 for the four scenarios described on the first page of this memo. Under the "current system" or base case scenario, the Tyee project would have the highest power rate, at 16.6 cents per kilowatt hour (KWH), with progressively lower rates for Swan Lake, Terror Lake, and Solomon Gulch.

Under the second scenario, increasing utilization of Swan Lake from 40 percent to 90 percent reduces the power rates for all projects except Solomon Gulch. The explanation for the higher Solomon Gulch rate is rather complex, but basically, Solomon Gulch would have to carry a larger portion of debt service because of the lower system average rate which would result from increased utilization of Swan Lake. Swan Lake rates would decrease the most, but Terror Lake and Tyee would also benefit because of the debt-sharing formula included in the HB 9 rate structure.

The third scenario is the stand alone case. The power rates for this scenario should be compared to the current system case, rather than the 90 percent Swan Lake usage case. Separation of the four power projects would have a large impact on rates, with large rate decreases for the Solomon Gulch and Swan Lake projects, and substantial rate increases for the Terror Lake and Tyee Lake projects. The primary reason for the differences in rates is the debt/equity ratio of the four projects. Solomon Gulch has no debt, while Swan Lake was 26 percent debt financed. On the other hand, Terror Lake ane Tyee were 58 percent and 36 percent debt financed, respectively. The higher level of debt for these two projects means that their power rates would increase if they were separated from the current APA system, unless some other action were taken to limit their rates, such as the Petersburg proposal for the Tyee project.

Finally, the fourth scenario shows the power rates for the four projects on a stand alone basis, with full utilization of the projects' capacities, except for Swan Lake, which is 90 percent utilized. The largest decrease in rates under this scenario is for the Tyee project,

because of the low (26 percent) level of utilization for this project in the early years of operation. Swan Lake rates would also decrease substantially. Power rates for Terror Lake would decrease by a lesser amount, because it is already expected to be 68 percent utilized in its first year of operation. Solomon Gulch is essentially fully utilized now, and so would not have any rate decrease under this scenario.

I hope this information is helpful. If you have any questions or would like additional research, please let us know.

JK

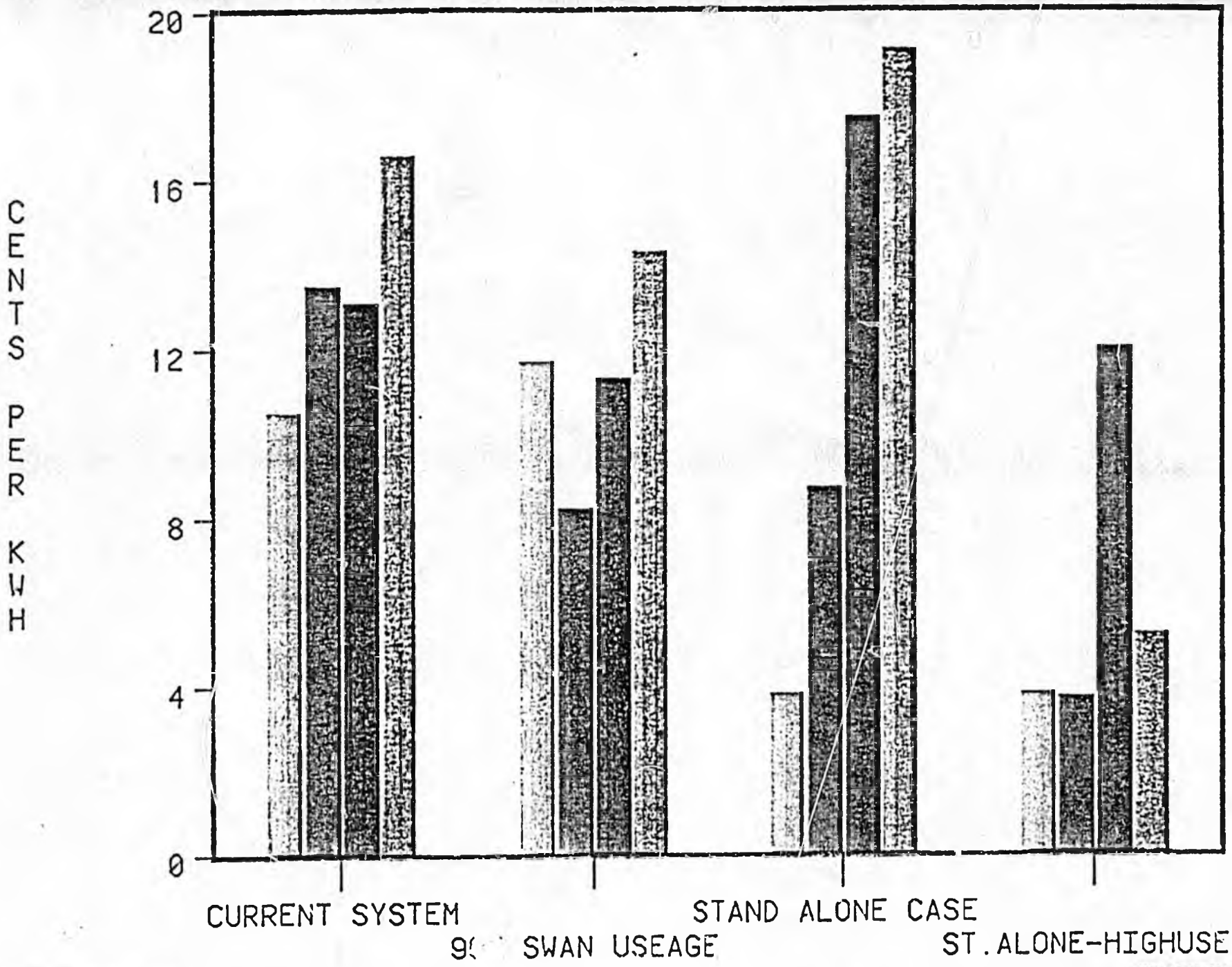
Attachments

COMPARISON OF ALASKA POWER AUTHORITY WHOLESALE RATES
FY 1986 -- Four Scenarios
(Cents Per Kilowatt Hour)

Project	Current System	90 Percent usage of Swan Lake	Stand Alone Case	Stand Alone Case High Usage
Solomon Gulch	10.5	11.7	3.8	3.8
Swan Lake	13.5	8.2	8.7	3.7
Terror Lake	13.1	11.3	17.5	12.0
Tyee Lake	16.6	14.3	19.1	5.2

Source: Alaska Power Authority, 5/83
House Research Agency 5/26/83

1986 - Four Scenarios



SOLOMON GULCH
SWAN LAKE

SCENARIO

TYEE LAKE

Prepared by: House Research Ag[illegible], 5/83
See text for further explanation.

ALASKA STATE LEGISLATURE
HOUSE OF REPRESENTATIVES
RESEARCH AGENCY

Pouch Y, State Capitol
Juneau, Alaska 99811
(907) 465-3991

May 27, 1983

MEMORANDUM

TO: Representative Ron Wendte

FROM: Jack Kreinheder
Research Staff

RE: Power Rates for APA Projects
Research Request 83-182 (Additional Information)

Suzanne Mullen of your staff provided a set of additional rate projections made by the Alaska Power Authority and asked that we prepare a comparative graph and table similar to that which was included in my memo of May 26. The graph and table are attached, and a brief explanation of the rate comparison follows.

The first scenario shown in the graph and table is identical to the second scenario included in my previous memo, and is repeated here as a basis for comparison with the other cases. The power rates shown for this first scenario are based on the current four-project APA system in FY 1986, with Swan Lake power sales at 90 percent of project capacity.

The second scenario shows the effect on power rates of excluding the Tyee Lake project from the APA system, with the other three projects remaining in the system. The power rates for Tyee would increase from 14.3 cents to 19.1 cents in 1986 if it were separated from the system, unless additional power from the project could be sold or some other action was taken to reduce rates. The rates for the other three projects would all decline if Tyee were removed from the APA system, because they would not have to share the higher cost of Tyee power.

Swan Lake is excluded from the APA system under the third scenario, with Tyee, Solomon Gulch, and Terror Lake remaining in the system. The power rates for Swan Lake would decline by more than 50 percent, from 8.2 cents to 3.7 cents, if this separation occurred, and if 90 percent of the power from the project can be sold in 1986. The rates for Tyee and Terror Lake would increase substantially if Swan Lake were removed from the power system, because of the loss of Swan Lake's relatively low cost power to share the system debt service. Solomon Gulch would have a minor rate increase.

Under the fourth scenario, Tyee and Swan Lake are both removed from the APA system, leaving only Solomon Gulch and Terror Lake. Tyee and Swan would both have the same power rates as if they had independently been excluded from the system. Terror Lake rates would increase from 11.3 cents in the base case to 13.7 cents under this scenario, while Solomon Gulch rates would stay about the same.

Please contact me if you have any questions or would like additional information.

JK

Attachments as stated

COMPARISON OF POWER RATES FOR ALASKA POWER AUTHORITY PROJECTS

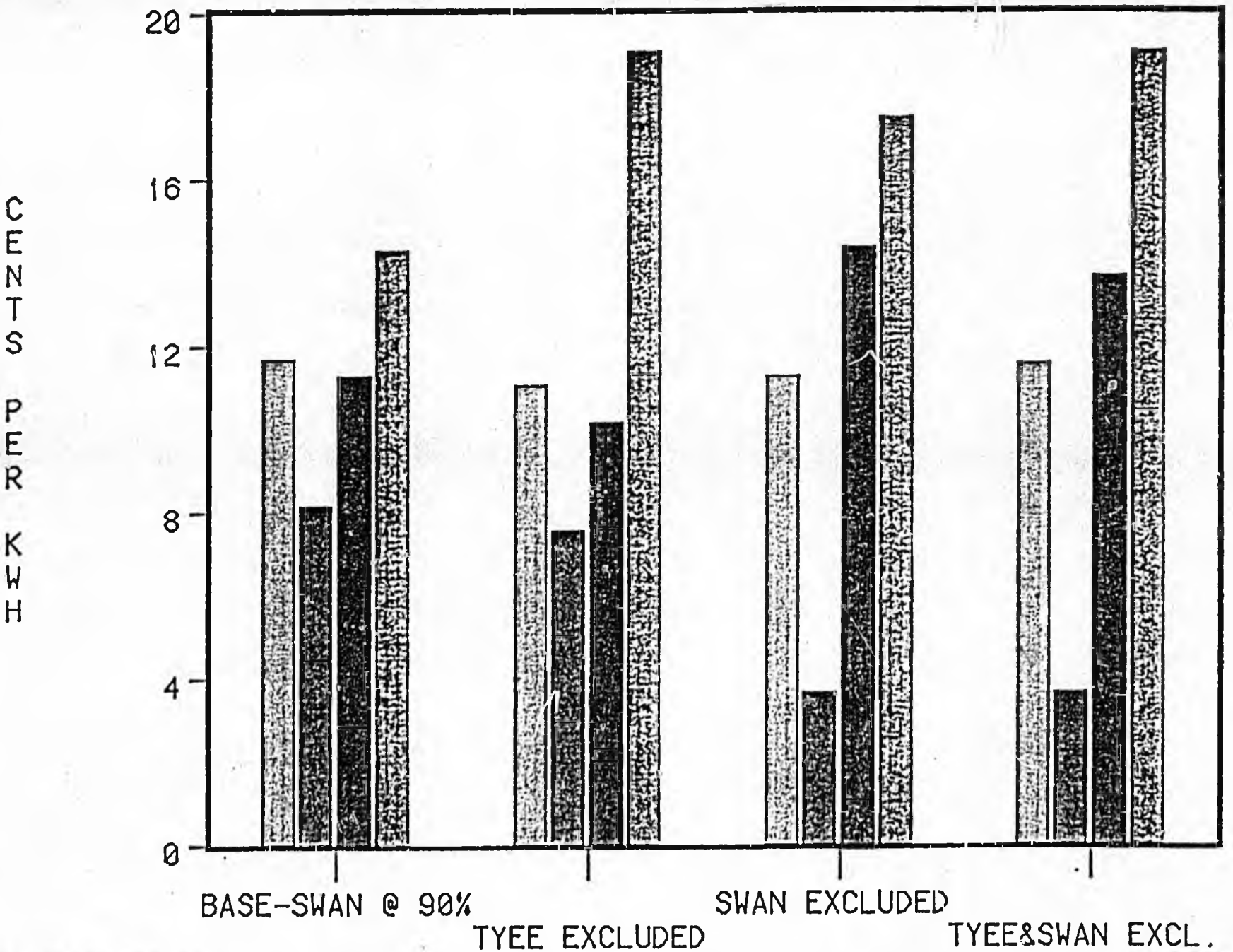
FY 1986 -- Four Scenarios
(Cents Per Kilowatt Hour)

Project	Base Case -- Assumes 90% Swan Lake Usage	Tyee Lake Exluded From APA System	Swan Lake Excluded From APA System	Tyee & Swan Excluded From APA System
Solomon Gulch	11.7	11.1	11.3	11.6
Swan Lake	8.2	7.6	3.7	3.7
Terror Lake	11.3	10.2	14.4	13.7
Tyee Lake	14.3	19.1	17.5	19.1

Source: Alaska Power Authority, 5/83
House Research Agency, 5/27/83

COMPARISON OF APA WHOLESALE POWER RATES

1986 - Four Scenarios (Version 2)



Scenario

Prepared by: House Research Agency, 5/27/83

See text for further explanation.

ALASKA STATE LEGISLATURE
HOUSE OF REPRESENTATIVES
RESEARCH AGENCY

Pouch Y, State Capitol
Juneau, Alaska 99811
(907) 465-3991

April 12, 1983

MEMORANDUM

TO: Representative Ron Wendte

FROM: Jack Kreinheder
Research Staff

RE: Susitna "Blackmail Clause" [AS 44.83.398(b)(2)]
Research Request 83-145

Suzanne Mullen of your staff asked that we briefly explain the current effect of [AS 44.83.398(b)(2)], commonly referred to as the Susitna "blackmail clause," on the viability of the Susitna hydroelectric project and on other Alaska Power Authority projects.

As you know, the clause states that if $5 billion is not appropriated to the power development fund by July 1, 1986, the power rate for each project owned by the Power Authority will increase to a level sufficient to return to the State 10 percent of the State investment in the project each year. There has been some controversy over the definition of the term "State investment" as used in the clause, which has resulted in uncertainty over the power rates that would occur if the clause went into effect. In any case, the clause would result in a substantial increase in power rates, up to 100 percent or more for some projects. The higher rates under the clause would apply not only to current projects, but to Susitna and other future projects, as well.

The "blackmail clause" was enacted as part of SB 25 in 1981, and was intended to provide some assurance that Susitna or another large Railbelt power project would receive appropriations comparable to those made in 1980 and 1981 for power projects in other regions of the state. At that time, $5 billion was considered sufficient to pay for almost the full cost of Susitna and the other projects under development.

As a result of the sharp declines in State revenues over the last two years, the blackmail clause is now considered by the Power Authority and other experts to be an obstacle, rather than an aid, to development of Susitna and other projects. As you know, the Power Authority has introduced (through the Governor's Office) legislation to repeal the clause.

The basic problem is that falling State revenues have made it extremely unlikely, barring a complete reversal in oil price trends, that the State can afford to appropriate $5 billion for power projects by FY 86. Approximately $500 million has been appropriated for power projects to date, so that an additional $4.5 billion would have to be appropriated in the next three fiscal years to meet the requirements of the clause. The latest Department of Revenue figures (30th percentile) project about $8.8 billion in total general fund revenues from FY 84 to FY 86. At current levels, the operating budget alone would require about $5.8 billion over these three years, leaving only $3 billion for all loan and capital appropriations. Under more optimistic revenue forecasts, it would be more practical to appropriate the required $4.5 billion for power projects, but very little money would remain for other capital projects or loans.

Because it appears almost certain that the "blackmail clause" would take effect if it remains law,* the electric utilities in the Railbelt and other areas of the state have become concerned about the effect of the clause on them. The clause, as part of the Power Authority's rate statutes, must be included in every power sales contract negotiated by the Authority. Although the Authority has obtained power sales contracts for the Solomon Gulch, Terror Lake, and Swan Lake projects, the utilities involved are very concerned about the prospect that their rates for purchased power could double in three years.

The Power Authority's financial advisors also fear that the clause could affect the issuance of revenue bonds for existing and future power projects, because the bond markets could be concerned about the ability and willingness of utilities to pay the higher rates under the clause. The financial advisors have stressed the importance of having the Power Authority's first bond issues be as straightforward and risk-free as possible in order to establish a sound credit rating.

With respect to Susitna, both the Governor and the Federal Energy Regulatory Commission (FERC) have stated that construction cannot begin, nor will a FERC license be issued, until power sales agreements for Susitna power have been signed by Railbelt utilities. As mentioned earlier, the "blackmail clause" applies to future power projects, not just projects now under construction or in operation. One of the

---

* There have been questions raised about the constitutionality of the clause, and it is possible that the clause would be struck down in court. The clause is currently the subject of a lawsuit by the Trustees for Alaska; however, the suit has been stayed pending legislative action on the measures to repeal the clause.

largest obstacles to the successful negotiation of the Susitna power sales agreements is that the power rates for Susitna depend heavily on the level of State funding for the project, which is uncertain at this time. The clause accentuates this problem by creating the prospect that Susitna power rates could be considerably higher than estimated by recent studies.

I hope this information is useful. If you have any questions or would like additional research, please let us know.

ALASKA STATE LEGISLATURE
HOUSE OF REPRESENTATIVES
RESEARCH AGENCY

Pouch Y, State Capitol
Juneau, Alaska 99811
(907) 465-3991

April 15, 1983

MEMORANDUM

TO: Representative Jack McBride

FROM: Jack Kreinheder JK
Research Staff

RE: Swan Lake Hydroelectric Project
Research Request 83-89

In response to a request made by Rena Bukovich of your staff, this memorandum provides the following information on the Swan Lake hydro project near Ketchikan:

(1) the expected construction cost and completion date of the project;

(2) a comparison of the projected cost of power from the project and current power rates in Ketchikan; and

(3) the status of the power sales agreement between Ketchikan and the Alaska Power Authority.

PROJECT STATUS

The Swan Lake hydro project is expected to be completed and begin operation by January 1984. According to John Ferguson, the Swan Lake project manager for the Alaska Power Authority, the project was 84 percent complete as of March 31, 1983. The project will have an installed generating capacity of 22.5 megawatts and an annual firm energy production of about 70 million kilowatt hours per year.

The total completed cost of the project was estimated at $99.2 million as of February 1, 1983, including about $2 million in contingencies. At that time, $72.4 million had been spent by the Power Authority on the project. The financing for the project consists of $69 million in State appropriations and $35 million in short-term interim financing obtained by the Power Authority. The interim financing comes due in March 1984, and will have to be refinanced at that time, probably through the issuance of long-term revenue bonds.

CURRENT AND PROJECTED POWER RATES

As you know, concerns have developed in recent months about the high projected cost of power from the APA hydro projects now under construction, primarily in regard to the Tyee Lake project.* Initial rate projections done by the Power Authority early this year indicated that power rates from the Swan Lake project might also exceed the cost of diesel generation in the first years of project operation. However, current rate analyses conclude that the cost of power from Swan Lake will be competitive with diesel generation from the beginning of project operation, even without any additional State funding or other legislative action. In addition, there appears to be a good chance of marketing surplus power from the project to industrial users, thus reducing power rates substantially.

Current Diesel Generation Costs

Bob Arnold, General Manager of the Ketchikan electric utility, stated that the current cost of diesel power generation for the utility is about 13 cents per kilowatt hour. This cost is up from 12 cents per kilowatt hour (KWH) in 1982, despite the decline in world oil prices. Mr. Arnold said that there has been only a small drop in diesel fuel prices in Ketchikan (about five cents per gallon) and that this drop was offset by increased operation and maintenance costs for the diesel generating units.

Ketchikan also generates about 45 percent of its power requirements from three hydro plants. The average cost of power from these plants is only about 4 cents per KWH. These existing hydro facilities will continue to be operated after Swan Lake begins operation, unless increased utilization of the project makes it economic to shut the smaller plants down.

Swan Lake Power Rates

The current "base case" power rate for Swan Lake is expected to be about 12.5 cents per KWH in FY 86, according to Mike Yerkes, Director of Operations for the Power Authority. This base case rate forecast assumes no additional State appropriations to the energy program and no sale of surplus power from Swan Lake. FY 86 is the critical year for power rates, because that is when the Terror Lake project would begin operation. Under the rate structure established last year by

---

* For a more detailed discussion of the Tyee Lake rate situation, see my memo of 2/11/83 to Representative Clocksin (Request No. 83-39).

HB 9, each power project has a separate rate, but the debt service is pooled for all of the projects under the energy program for Alaska. Therefore, the addition of new projects to the system can affect the rates for earlier projects such as Swan Lake.

The higher ratio of debt to equity for Terror Lake and the way in which debt is pooled among the four projects -- Swan, Tyee, Terror, and Solomon Gulch -- results in power rates for all of the projects peaking when Terror Lake is added to the system in FY 86.

As noted earlier, Swan Lake is expected to begin operation in January 1983. During the first few months of operation, until long-term debt is issued, the power rate will be set at a level to cover only operation and maintenance costs. This rate will probably be in the range of 4 to 5 cents per KWH. As of July 1, 1985, the power rate is projected to increase to about 9 cents per KWH, with a further increase in July 1986 to the 12.5 cents per KWH rate cited above. The rate is then expected to decline slowly to 11 cents in FY 90, 8.5 cents in 1995, and just over 6 cents in the year 2000. See attachment A for a chart of this rate trend.

It should be noted that these rate projections are somewhat arbitrary in that they do not account for the addition of other power projects such as Bradley Lake or Susitna. However, the future of these projects is still uncertain and their impact on power rates depends largely on the financing used to build them.

If these rate estimates are accurate, there should be no difficulty in marketing power from the Swan Lake project. The highest power rate would be in FY 86 at 12.5 cents per KWH, less than the 13 cents per KWH which it now costs Ketchikan to generate diesel power. If oil prices drop substantially or revenue bond interest rates are higher than expected by the Power Authority, a rate problem could develop for Swan Lake; however, this appears unlikely.

Sale of Surplus Power

About 40 percent of the generation capacity of the Swan Lake project would be used in the first years of project operation, based on current Ketchikan power demand and growth rates. Mr. Arnold has had discussions with the managers of industrial plants in Ketchikan who now generate their own power about the possibility of purchasing Swan Lake power. He believes it is likely that agreements to market surplus Swan Lake power can be negotiated and that the power output of the project can be fully utilized from its first year of operation.

Full utilization of Swan Lake's capacity would decrease the power rate from 12.5 cents to about 8 cents per KWH in FY 86. Under this arrangement, power sales to industrial users would be made on an interruptible basis, meaning that sales to industrial users would be reduced as the power demand of residential and commercial users increased in future years.

Full or increased utilization of the Swan Lake project would also reduce power rates for the other three projects under the energy program, because of the pooling of debt service among the projects. With higher utilization, Swan Lake would pay for a larger percentage of the debt service for all the projects. This effect is most important for the Tyee project because it has the highest power cost of the four projects. For Tyee, full utilization of Swan Lake would reduce the power rate from 16 cents per KWH to about 13.5 cents.

This lower rate would substantially improve the marketability of Tyee power, although a further decrease in rates through other means could still be necessary. It should be noted that increasing the utilization of Tyee itself would be the most effective means of lowering the power rate from that project. Consideration is being given to this option, but the market for surplus power in Petersburg and Wrangell appears weaker than in Ketchikan. One longer-term option would be to construct an intertie between the Tyee and Swan Lake projects, in order to make additional capacity available to Ketchikan when the power from Swan Lake is fully utilized. The Power Authority is currently conducting a study to evaluate this option, as well as other power sources for Ketchikan.

Attachment B illustrates the relationship between increased utilization of Swan Lake and power rates for the project. The figures also show that Swan Lake covers an increasing percentage of debt service for the energy program as utilization rises. This increasing share of debt borne by Swan Lake is what causes the decline in power rates for other projects.

The one drawback or limitation to the increased utilization of Swan Lake is that the contracts for the sale of surplus power will not be firm take-or-pay contracts. This means that if an industrial purchaser shuts down because of market conditions or a strike, for example, the purchaser will not have to pay for the power which is not used. As a result, the power rate paid by the Ketchikan utility would have to revert to a higher rate to cover the debt service and operating costs of the project.

This situation would not be as problematic for Ketchikan as for Petersburg and Wrangell, because the highest rate for Ketchikan would still be below the cost of diesel generation (according to current estimates).

However, for Petersburg and Wrangell, the increased power rate resulting from reduced utilization of Swan Lake could be higher than the cost of diesel generation for these communities. Therefore, Petersburg and Wrangell may be reluctant to sign power sales agreements based on a power rate that depends on full utilization of Swan Lake. It may be necessary to implement some type of "backup plan" based on State appropriations or loans to ensure that the power rates for these cities will not exceed an acceptable level.

The Power Authority Board of Directors will consider the power rate issue at their board meeting scheduled for Monday, April 18 in Juneau.

SWAN LAKE POWER SALES AGREEMENT

An agreement for the purchase of Swan Lake power was signed by the Power Authority and the City of Ketchikan in the spring of 1982. The agreement now needs to be revised to incorporate the substantial changes made by HB 9, which was enacted at the end of the 1982 legislative session. The original agreement specified that the contract was subject to statutory changes and would be changed to reflect any changes.

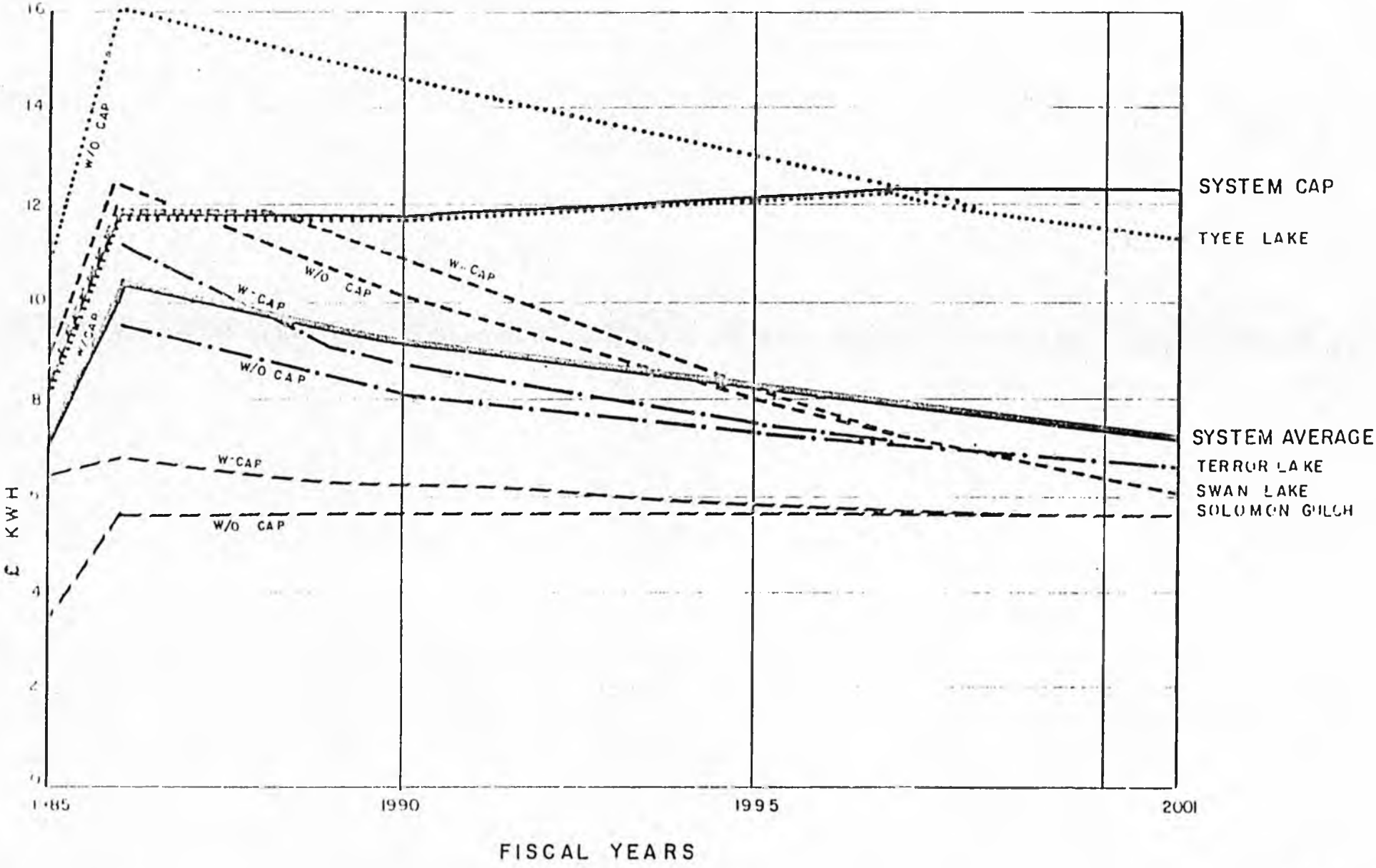
The Power Authority and the City of Ketchikan decided last fall to wait until the end of the current legislative session before revising the existing contract, rather than risk having to revise the contract a second time if changes to the Power Authority's statutes are made during this session. As the project will not begin operation until at least January 1984, this delay should not have any significant effect on the project.

* * * * *

I hope you find this information useful. If you have any questions or would like additional research, please do not hesitate to call.

Attachments

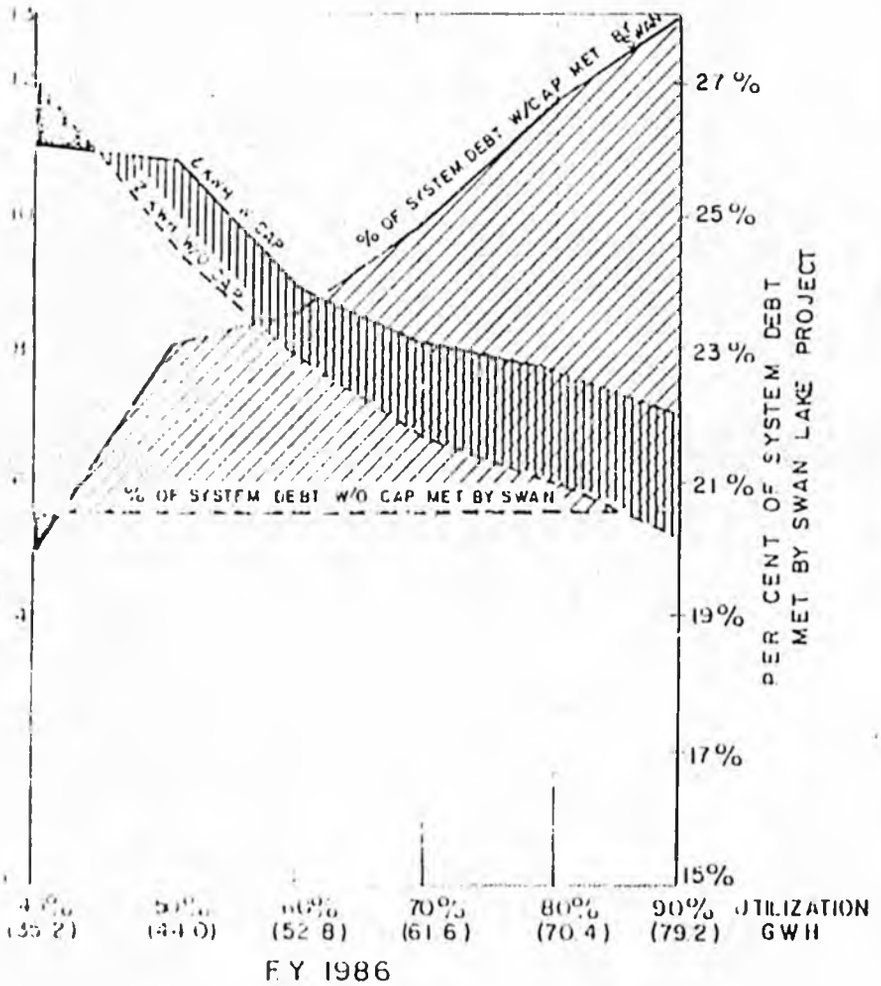
HOUSE BILL 9
BASE CASE POWER RATE STRUCTURE (1985-2001)

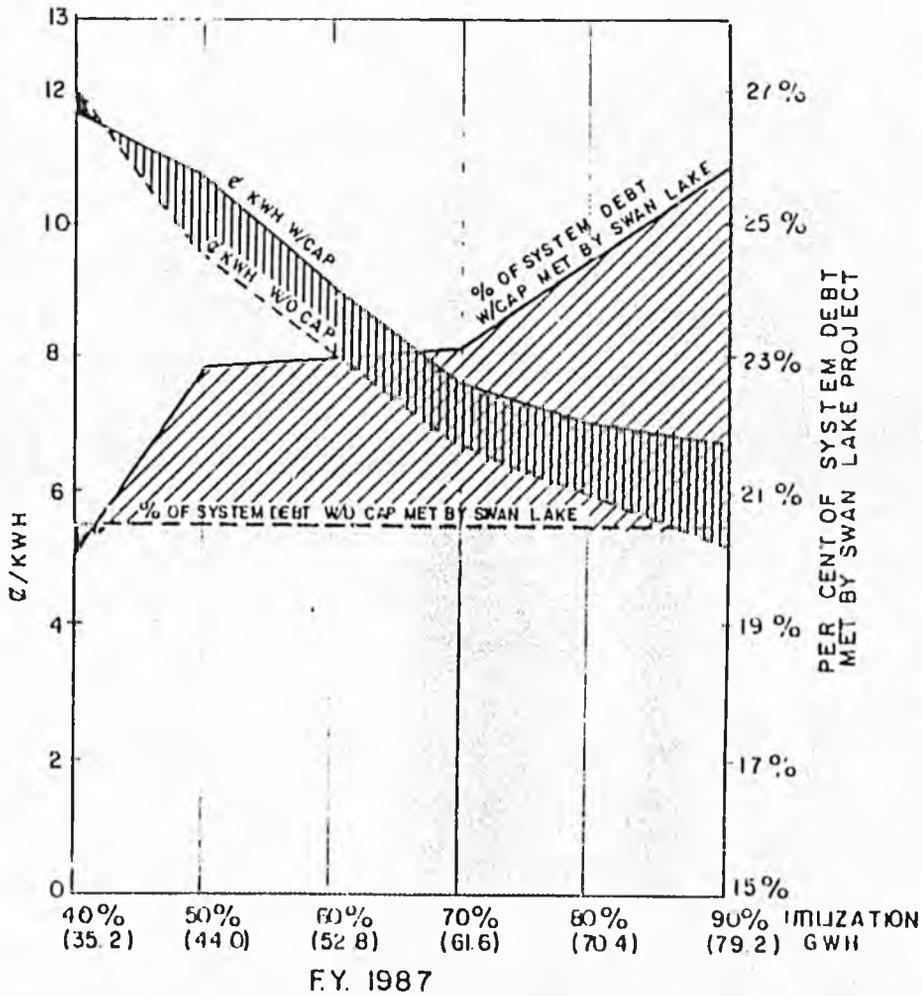


Attachment B

UTILIZATION ANALYSIS FOR THE SWAN LAKE PROJECT

F.Y. 1986, F.Y.1987





ANALYSIS:

- AS UTILIZATION OF SWAN LAKE INCREASES THE "WITHOUT CAP RATE" AND THE "WITH CAP RATE" DECREASES
- THE AMOUNT OF TOTAL SYSTEM DEBT COVERED BY SWAN LAKE BETWEEN F.Y.1986 AND F.Y 1987 DECREASE AT EACH LEVEL OF UTILIZED CAPACITY.

ALASKA STATE LEGISLATURE
HOUSE OF REPRESENTATIVES
RESEARCH AGENCY

Pouch Y, State Capitol
Juneau, Alaska 99811
(907) 465-3991

February 11, 1983

MEMORANDUM

TO: Representative Don Clocksin

FROM: Jack Kreinheder
Research Staff

RE: Lake Tyee Power Costs and Project History
Research Request 83-39

You requested that we summarize the current status of contract negotiations for the sale of power from the Lake Tyee hydro project. You asked that we address the expected cost of power from the project, current power costs in Petersburg and Wrangell, and alternatives for reducing Tyee power costs to marketable levels.

The attached letter from the Alaska Power Authority outlines the sequence of construction cost estimates for the Tyee project and the decisions made by the Power Authority Board concerning project construction.

It is important to emphasize that the power cost projections in this memorandum are preliminary and are currently being revised by the Power Authority to reflect detailed financing arrangements for the Tyee project. These revised cost estimates will probably be somewhat lower than the figures cited here.

SUMMARY OF FINDINGS

The basic power marketing problem for the Tyee project is that the wholesale cost of power from the project in its first years of operation is projected to be about 40 percent higher than current power generation costs for Petersburg and Wrangell. The Power Authority estimates that Tyee power will cost about 16.5 cents per kilowatt hour (KWH) in FY 1986. Recent press reports have cited claims by Petersburg officials that the retail cost of power from Tyee would be 100 percent higher than current levels. However, these claims are disputed by the Power Authority, as discussed later.

Power generation in Petersburg and Wrangell now costs about 12 cents per KWH and this cost is not likely to increase substantially over the next several years unless oil prices increase more than expected by most forecasters. These communities are understandably not willing

to sign contracts to purchase Tyee power at rates substantially higher than current generation costs.

If no action is taken by the legislature to reduce Tyee rates, it appears that power sales agreements could not be obtained and the Power Authority would not be able to sell the necessary revenue bonds to repay the interim financing for the project. Although I did not research the possible steps the Power Authority might take in this situation to avoid a default on the Tyee debt, the Authority would probably be in a precarious financial position.

There are several possible approaches to reducing power rates for the Tyee project, most of which require more State money:

(1) Make an additional lump sum appropriation to the hydro program to reduce the amount of debt financing required for Tyee and other projects. About $70-80 million may be required to reduce Tyee rates to the level of current power costs. If desired, this appropriation could be structured as a loan, to be repaid to the State after Tyee power becomes competitive with the cost of power from present generation facilities.

(2) Appropriate a smaller amount of about $20 million only to the Tyee project and enact temporary legislation which would reduce only the Tyee rates. (Under present law, an appropriation to any power project would reduce the power rates by an equal percentage for all projects.)

(3) Make annual appropriations of about $2-3 million to cover a portion of the debt service costs for the Tyee project, allowing power rates to be reduced until the project becomes competitive with diesel generation costs.

Administration Choice → (4) Amend the rate structure under present law to spread the higher cost of Tyee power among other power projects.

(5) Restructure the long-term debt for the Tyee project to reduce debt service costs in the early years of project operation (the viability of this approach is uncertain).

TYEE POWER COSTS

The following table shows projected wholesale power costs for the Tyee project from FY 85 to FY 90.

PROJECTED TYEE WHOLESALE POWER COSTS
(Cents per Kilowatt Hour)

Fiscal Year	1985	1986	1987	1988	1989	1990
Power Cost	12.8	16.5	16.7	16.8	17.0	17.2
Power Sales (Millions of KWH)	32.0	32.8	33.6	34.5	35.3	36.2

Source: Alaska Power Authority for FY 85-86, adjusted by House Research Agency for FY 87-90 for 4 percent annual increase in debt service cap, 3 percent average annual load growth for all APA projects, and 5 percent annual inflation in operation and maintenance costs. Debt service calculations based on 35-year revenue bonds at 11 percent interest, with a 1.1 coverage level.

Again, these projections are preliminary, and more accurate figures will be available within a week. These projected rates are probably on the high side because they do not account for the interest earned on debt reserve funds or the lower-than-expected cost of the interim financing for the project. The Power Authority's financial advisors are now working to incorporate these and other adjustments to arrive at more accurate rate projections. One uncertainty in these rates is that they assume the Wrangell sawmill will buy about 7 million KWH per year -- about 20 percent of total projected power sales from the project. The sawmill was shut down for over a month this winter and could be an uncertain buyer of Tyee power.

The Tyee project is scheduled to be completed in early 1984, and may be on line as soon as October 1983 if work continues at its current pace. When the project begins generating power, the initial rate will be set to cover only operation and maintenance costs (4-5 cents/KWH) until the start of the 1985 fiscal year, when the rate will increase to cover the costs of long-term financing for Tyee and the Swan Lake project. The power rate will increase again in FY 86 to reflect the cost of

revenue bonds issued for the Terror Lake project. After 1986, the Tyee power rate will probably increase by about two percent per year.*

PROJECT FINANCING

The completed cost of the Tyee project is now estimated at $115 to $125 million. Construction of the project has been financed by $82 million in appropriations from the legislature and $50 million in interim financing. This interim financing will have to be repaid in the spring of 1984 through the issuance of revenue bonds, additional State appropriations, or a combination of the two. The Swan Lake project also has $50 million in interim financing which will be repaid at about the same time. Terror Lake has $100 million in short-term debt which will be due in 1985.

HB 9 RATE STRUCTURE

The financing and power costs for Tyee are tied to those of other Power Authority hydro projects under legislation enacted in 1982 (CCSHB 9 -- Chapter 155). This statute requires each hydro project to pay its "proportionate share" of the total debt service costs for all projects, as determined under a formula in the statute. Basically, the statute means that if the construction cost of Tyee is 25 percent of the total cost of all projects in the system, Tyee must pay 25 percent of the total debt service costs for all projects. The wholesale power rate for each project is then determined by adding operation and maintenance expenses to debt service costs and dividing this sum by the expected power sales for each project.

The HB 9 rate structure replaced the "postage stamp" or single statewide rate formula which was enacted in 1981 by SB 25. The major purpose for the change in the rate structure was to increase the incentive for building cost-effective and properly sized projects, by linking power costs more directly with project construction costs.

When the conference committee on HB 9 reviewed rate projections for the four power projects, there was concern that the rates for the Tyee and Swan Lake projects would be excessive under the HB 9 rate structure. As a result, the committee included in the legislation a limit or cap on the debt service cost for each project. Under this cap, no project must pay more than the average debt service cost for all Power Authority

---

* The rate calculation is complex, but the three main factors that affect the project rates after 1986 are: inflation in O&M costs, the rate of growth in power sales, and the 4 percent annual increase in the HB 9 debt service cap. The addition of the Bradley Lake project or other projects could also affect Tyee rates substantially.

projects, plus a certain percentage which increases each year (8 percent in FY 85, 12 percent in FY 86, and so on). Although this debt service limit reduces the power rate for Tyee substantially, it does not reduce the rate to a marketable level.

Because the debt service costs are pooled for all projects in the system, an appropriation to Tyee or any other project would reduce the power costs for all projects by an equal percentage.

PETERSBURG AND WRANGELL POWER COSTS

Current Costs

Exact power costs for Wrangell and Petersburg were not readily available at this writing. However, the busbar generation cost (equivalent to the wholesale power cost from Tyee) for both communities is approximately 12 cents per KWH. Wrangell generates all of its electricity from diesels, while Petersburg obtains about half its power from the Crystal Lake hydro project, which was built many years ago. The Petersburg utility apparently has a higher level of debt than the Wrangell utility, which offsets the lower cost of power from the hydro facility.

While most of the recent publicity concerning the Tyee project has focused on the city of Petersburg, the Power Authority staff maintains that Wrangell would face a larger rate increase if Tyee power were purchased at current projected rates than would Petersburg. According to Mike Yerkes, who is negotiating the Tyee contracts for the Power Authority, this is because Wrangell would convert entirely from diesel generation to Tyee power, while Petersburg would continue to generate about half its power from the low-cost Crystal Lake hydro project, which was built decades ago.

Future Costs

The rate of increase in future generation costs for Petersburg and Wrangell is one of the basic questions to consider in determining what approach the State might take to the Tyee situation. The cost of diesel fuel is the largest expense component for these utilities, averaging about 9-10 cents per KWH generated over the past year. As you know, the future of world oil prices is highly uncertain and the range of forecasts is considerable. However, the most recent Department of Revenue forecast projects a 28 percent cumulative decrease in the real price of oil through FY 87. In nominal terms, oil prices in FY 88 are forecast to be about the same as today.

If this projection is accurate, it may be the early to mid-1990s before diesel generation costs would increase to the level of Tyee

costs. However, an additional consideration is that Wrangell and Petersburg may have deferred expansion of their generation facilities in expectation of receiving Tyee power. Therefore, new generators might have to be added to meet increases in load growth during the 80s, which would increase power rates.

Retail Power Rates

Part of the publicity over the Tyee project centered on claims by Petersburg officials that they would have to add about 9 cents per KWH to the wholesale cost of power from Tyee for distribution and overhead costs, thus doubling the retail power costs from current levels. The Power Authority staff believe this figure is highly inflated and does not account for savings in diesel maintenance costs which would occur when Tyee comes on line. The staff is preparing documented estimates of what they feel are more realistic distribution and overhead costs.

Other Concerns

It is important to note that the cost of power from current projects is not the only concern of Petersburg, Wrangell, and other cities or utilities to be served by Power Authority projects. These groups are also concerned that under the current rate structure, their power rates could increase substantially as additional projects are added to the system. Whether this would occur depends on the level of State funding for the additional projects. If the ratio of State funding to bonded costs for new projects is lower than the average for current projects, the rates for current projects would rise.

The "Susitna Blackmail Clause" [AS 44.83.398(b)(2)] is an additional source of concern for municipalities and utilities, as the clause could dramatically increase power rates if not repealed. This clause would increase power rates by requiring a 10 percent annual return on investment to the State if $5 billion has not been appropriated for power projects by 1986.

POSSIBLE APPROACHES TO THE TYEE RATE PROBLEM

There are several possible approaches to the Tyee rate problem, as summarized earlier. The choice among them is complex and depends on basic policy issues relating to the power development program. Some of the more important factors to consider are discussed below.

Lump Sum Appropriation

This approach would be the most expensive; preliminary calculations indicate that $70-80 million would be necessary to lower the Tyee power rates to the cost of diesel generation.* Although the outstanding debt on the Tyee project is only $50 million, the pooling of debt service among all projects under the APA rate structure requires a larger appropriation to reduce Tyee rates sufficiently. A lump sum appropriation would also lower the power rates for Solomon Gulch, Swan Lake, and Terror Lake by an equal percentage (about 40 percent). This raises two questions.

First, is it necessary or desirable to reduce the power rates for other projects that already have reasonably priced power? Second, what effect would lowering the rates for all projects now on line or under construction have on future projects? Lowering the average power rate would reduce the debt/equity ratio for current projects and require a higher level of State appropriations for future projects unless power rates were to be increased for all projects.

Special Tyee Legislation

If special legislation were passed so that a one-time appropriation would be used to reduce only Tyee power rates, roughly $20 million would be required to provide the necessary rate reduction. However, this approach could be viewed as creating a precedent for "bailing out" high-cost projects which might result in similar problems for future projects.

Annual Appropriation

In lieu of a one-time appropriation, the legislature could make annual appropriations of about $2.4 million to cover the debt service shortfall that will result if power is sold at 12 cents rather than 16.5 cents per KWH. These appropriations would continue and eventually diminish

---

* I have not included these calculations here for the sake of brevity, but can provide them if desired.

to zero as the cost of diesel generation increased to match the cost of Tyee power or the cost of Tyee power fell. Although it is uncertain how long these annual appropriations would be required, depending on fuel escalation rates and other factors, the total cost would probably be half or less the cost of a lump sum appropriation.

The Petersburg and Wrangell utilities would be eligible for rate relief under the power cost assistance program, but only for the portion of retail rates above 16 cents in FY 86. This floor increases by one cent each fiscal year. Also, cost assistance is available only for the first 600 KWH per month sold to each customer. Therefore, a separate appropriation specifically for Tyee debt service might be required each year in order to reduce power rates sufficiently.

Modification of Rate Structure

It would be technically possible to modify the statutory rate structure to reallocate at least part of the Tyee debt service to other lower cost projects, primarily Solomon Gulch and Terror Lake. The communities served by these projects would probably strongly oppose this change. In addition, the bond markets could view this juggling of the rate structure with some concern.

Restructure Project Debt

It may be possible to reduce the debt service costs for the first few years of operation of the Tyee project by borrowing additional funds with which to pay part of the interest on the bonds for several years. According to Sterling Gallager of John Nuveen and Associates, it is legally possible to have this type of arrangement for five years without violating federal arbitrage regulations. However, the financial viability of this approach is uncertain and would require additional research.

Another possibility would be to use a geometric financing approach, in which the debt service schedule would be shifted so that debt service costs would be lower in the early years and increase gradually as the project power sales increased. This approach has been used in a few utility bond issues, but it is uncommon and would also require more investigation to determine its viability for the Tyee situation.

IMPLICATIONS FOR OTHER POWER PROJECTS

A number of legislators and other observers have expressed concern about the possibility of the Tyee marketing problem occurring with Susitna or other hydro projects. This is a controversial issue with numerous points of view, but a few observations may be helpful in understanding the problem.

It is important to recognize the distinction between the economic feasibility of a hydroelectric project and the marketing feasibility of the same project. Although the economic feasibility of the Tyee project is an issue itself, the point is that even a clearly feasible hydro project will usually require some sort of grant or low-cost financing to lower power rates to marketable levels in its early years of operation. After a period of years, increasing power sales and higher fuel costs for the alternative generation source should result in a break-even point, after which the hydro power becomes less expensive. The initial subsidy to the project can then be repaid, if necessary.

In the case of the Tyee project, the continually increasing cost estimates for the project made it difficult to determine how much State money was required to achieve marketable power rates. The power-marketing problem for Tyee is also accentuated by the fact that Tyee has the largest excess generation capacity of the four projects now on line or under construction -- only about 25-30 percent of the project's capacity will be used in the first years of operation. This lower level of utilization means that a higher proportion of State funds is necessary to obtain reasonable power rates.

A major element of the Tyee problem appears to be that neither the legislature nor the Power Authority placed sufficient emphasis until recently on the marketing of power from the projects under construction. Part of the reason for this apparent oversight is that in 1980 and 1981, State revenues were increasing rapidly and it was expected that most of the project costs would be funded through direct appropriations or low-cost loans, rather than by revenue bonds. With this expectation, power marketing was not an issue because of the low power costs. The sharp decline in State revenues has resulted in more reliance on debt financing, causing higher power rates and the marketing problem demonstrated by the Tyee project.

With respect to the Power Authority, an additional problem was the lack of staff with experience in marketing and rate issues. It was only about 10 months ago that the Power Authority hired someone with rate setting and utility experience. Until then, the focus of the staff

was more on the feasibility, design, engineering and financing aspects of power development.

A final contributing factor to the Tyee situation was that the revisions to the Power Authority rate structure enacted in 1982 by HB 9 were not based on a full assesment of the effect of these rate revisions on the marketability of power from Tyee and the other projects.

The likelihood of the Tyee rate problem occurring with other power projects is difficult to assess. The Power Authority appears to have made good progress in dealing with the marketing issue. Several measures have been taken to avoid the recurrence of the Tyee cost escalation problem, and a number of recent bids for construction of the Terror Lake and Anchorage-Fairbanks projects have been substantially lower than engineering estimates.

In addition, the Authority has proposed changing its procedures to require power sales contracts to be signed before project construction begins, and this was done for the Terror Lake project. In the past it has been difficult to obtain contracts because it was uncertain how much funding would be provided by the legislature, and there is a natural incentive for communities to lobby the legislature for additional funds to reduce their power rates. It may also be difficult to obtain pre-construction power sales agreements for the Susitna project because of the long lead time of the project.

The chances of the Tyee power marketing problem occurring with future power projects would be reduced if the legislature made certain it had sound estimates of the maximum appropriation necessary for power marketing purposes before approving construction of a project, and committed itself to the appropriation of the necessary amount. Any changes in the rate structure should also be made only after detailed evaluation of the impact on project power rates and marketability.

* * * * *

I hope this information is useful. If you have any questions or would like additional information, please don't hesitate to call.

JK

Attachment

ALASKA POWER AUTHORITY

334 WEST 5th AVENUE · ANCHORAGE, ALASKA 99501

Phone: (907) 277-7641
(907) 276-0001

February 9, 1983

Mr. Jack Kreinheder
House Research Agency
Pouch Y
Juneau, Alaska 99811

Subject: Tyee Hydroelectric Project-Summary of Estimated Total Costs

Dear Jack:

As per your request, following is a brief summary on the sequence of events on the Tyee hydropower project primarily relating to cost. The summary of Board actions was extracted from our corporate minutes. Most of the actions taken by the Board were based on advice from myself and my staff.

On December 19, 1979, the Alaska Power Authority submitted a revised application to the Federal Energy Regulatory Commission (FERC) for the construction of the Tyee Hydroelectric Project in the vicinity of Wrangell and Petersburg, Alaska. Our engineers, R.W. Retherford Associates/International Engineering Company (IECO) estimated the total cost of the project at that time at $49,590,000 (1980$'s). With an allowance for inflation and interest during construction the estimated total capital investment at that time came to $53,333,000.

In September 1980, IECO submitted a revised cost estimate of $50,976,000 (August 1980$'s).

Early in 1981, the Power Authority retained EBASCO Services, Inc., to prepare an independent cost estimate. EBASCO subsequently estimated the total project cost at $96,693,000 (May 1981$'s). Escalated to the midpoint of construction, this would represent a completed cost of approximately $110 million. After reviewing the EBASCO estimate, IECO conceded that its previous estimates were low and IECO raised its estimate to $81,069,000 (June 1981$'s). EBASCO refuted this revised estimate.

Procurement of long-lead-time turbines began in July 1981 in anticipation of a FERC license. The Board of Directors was realigned by Statute in the latter part of July 1981. The FERC issued a license on August 5, 1981 and the award of several additional procurement and one construction contract followed almost immediately thereafter.

IECO continued to make monthly reports on the status of the project, including estimated total project costs. It is important to note that by the end of March 1982, IECO had increased its project estimate to $97,072,000,

including engineering costs prior to construction. In the March report the overhead transmission line was estimated to cost $12,840,000 plus a $6,000,000 contingency. Less than two months later, during the bid opening for that contract, IECO provided an engineer's estimate of $23,280,887.00--an estimate that is 24 percent above any previous estimate, including contingency funds. The actual low bid was even higher at $24,901,466.

Starting with the IECO estimate from the March 1982, report, adjusting for the actual low bid on the transmission line, and adding the estimated cost for a proposed separate substation construction contract, the estimated total project cost was increased by IECO to $110,133,000 (May 1982). This did not include approximately $5 million for owner provided insurance. During the months that followed, the total project cost has decreased and increased, slightly, as adjustments have been made for actual bids on relatively small procurement contracts..

In December 1982, and again in January 1983, senior staff of IECO and IECO's parent company, Morrison Knudson (M-K), met with representatives of the Power Authority to discuss construction management of the project, including total project costs. The latest information from IECO is that the total project cost will not exceed $124,886,100. The Power Authority has asked the parent company, M-K, to completely review this estimate. A report from the M-K staff is anticipated the second week of March 1983.

A summary of Board actions, as extracted from our corporate minutes, is as follows:

October 4, 1978 Board receives report on Tyee Project indicating that, according to the reconnaissance study by Robert W. Retherford Associates, (RWR) the Project looks favorable and that Thomas Bay Power Commission (TBPC) will soon enter into contract with RWR for Federal Energy Regulatory Commission (FERC) work and that TBPC may request the Alaska Power Authority to take over the project.

November 18, 1978 APA Board voted to make $120,000 loan to TBPC for Tyee FERC work and this would supplement the $300,000 available from the Water Resources Revolving Loan Fund (WRRLF) in order to cover the $475,000 contract with RWR.

June 21, 1979 Board makes a loan to TBPC of $60,000 for Tyee Project. TBPC and Representative E.J. Haugen request the APA take over Tyee. The Board directed staff to bring information back at next Board meeting for Project take-over.

September 27, 1979 Tyee Letter of Understanding with TBPC adopted by Board.

November 2, 1979 Board authorized Executive Director to submit FERC license application. Also passed "stop-the-clock" resolution needed for bonding.

February 7, 1980 Board agreed to extend contract for advanced Engineering

and Design to IECO for Tyee but it was later decided with legal council to seek competitive proposals.

April 13, 1980 Board selects IECO for the Engineering and Design from among three proposals.

October 23, 1980 Board informed that costs have increased from $39,000,000 to $51,000,000 and has IECO explain to Board.

April 20, 1981 Board selects consultant panel as required by FERC.

May 14, 1981 Board awards Bids for Turbines.

July 6, 1981 Board considered awarding contract for Steel Towers and Conductors but defers "notice to proceed" until after opening of major Civil Contract so that the Board could get a better fix on the true cost of the Project.

August 18, 1981 FERC license has been received. Bids for Civil construction were reviewed as were the economics of the Project based on new cost estimates. Notice-to-proceed was given on Towers and Conductors. The Board was informed that existing funds were insufficient and that interim financing would be necessary. Board deferred action until the next meeting.

September 10, 1981 Board awards Civil Works contract to Southeast Harrison Western (SEHW) after lengthy debate.

October 2, 1981 Board informed on legal actions against Tyee construction contracts. Need for interim financing was discussed and indicated a proposal would be presented to the Board in December, 1981. Risk Management's desire to use "Wrap-up Insurance" on Tyee Project was discussed and actions that would be taken to effectuate such a program.

December 15, 1981 A Finance Plan was presented to the Board. It was recommended that the Board appoint a subcommittee to review the feasibility of the Tyee Project based on present knowledge of the costs. Commissioners Warr and Mueller and Dr. Weeden were appointed to the subcommittee. The Board moved that final financing documents for financing be prepared. The economics of the Project was reviewed.

January 22, 1982 Senator Dankworth and Representative Haugen addressed the Board and recommended proceeding with interim financing. Board authorized securing of $50,000,000 in interim financing. Board awarded a contract for Underwater Cables.

May 25, 1982 The Board awarded the Overhead Transmission Line contingent upon the Legislature not passing a piece of legislation that was being considered but that subsequently was not passed. Thus on June 3, 1982 the Executive Director informed the Board of his intent to issue the award for Transmission Tower construction.

October 22, 1982 The Board awarded contract for Transformers.

I trust this information is of assistance to you. If there is any further information you need, please call on me.

Sincerely,

Eric P. Yould
Executive Director

CC:
C. Conway
Comm. D. Lyon

ALASKA STATE LEGISLATURE
HOUSE OF REPRESENTATIVES
RESEARCH AGENCY

Pouch Y, State Capitol
Juneau, Alaska 99811
(907) 465-3991

March 10, 1983

MEMORANDUM

TO: Representative Jack McBride

FROM: Jack Kreinheder
Research Staff

RE: History of Hydro Projects in Election District 1
Research Request 83-54

You requested that we summarize the development of hydro projects in Election District 1, focusing on the Swan Lake, Lake Grace and Tyee Lake sites. As you know, the Swan Lake and Tyee Lake projects are under construction by the Alaska Power Authority, while Lake Grace was considered as an alternative to the Swan Lake site.

Existing Hydro Projects in Ketchikan and Petersburg

The City of Ketchikan's electric utility generates about 45 percent of its annual power production from three existing hydro facilities at Ketchikan, Beaver Falls, and Lake Silvis. The generation capacity of these hydro units is 4,200, 5,000, and 2,100 kilowatts, respectively. The first generating unit at the Ketchikan site was installed in 1938, with another unit added in 1957. The first Beaver Falls unit was installed in 1946, with two more generators added in 1954. The Lake Silvis plant was installed in 1968.

Ketchikan's remaining power demand is met by diesel generators with a total capacity of about 18,300 kilowatts. These diesel units will be retired except for standby generation purposes when the Swan Lake project is completed.

Petersburg generates about 50 percent of its current power requirements from the Crystal Lake hydro project. This project was originally developed in 1929, with a major expansion in 1955. The current generation capacity of the Crystal Lake plant is about 2,000 kilowatts.

The City of Wrangell presently generates all of its electricity from diesel plants.

Lake Grace

Lake Grace is located about 15 miles east of Swan Lake on the west side of Behm Canal. The proposed hydro plant at Lake Grace would have been substantially larger than Swan Lake in terms of power output and cost. The Lake Grace project would provide 25,000 kilowatts (KW) of capacity and 102 million kilowatt hours (KWH) of average annual energy, in comparison to 18,000 KW of capacity and 85.4 million KWH of energy for the Swan Lake project.

You expressed an interest in how the decision was made by Ketchikan to proceed with development of the Swan Lake hydro site, rather than the Lake Grace site. The principal basis for this decision was an appraisal report prepared by R.W. Beck and Associates in June 1977 for Ketchikan Public Utilities. This report evaluated the technical and economic feasibility and compared the cost of power for hydro developments at Swan Lake, Lake Grace, and Mahoney Lake, which is a smaller site.

The R.W. Beck report found that although hydro development was feasible at each of the three sites, Swan Lake was the most economic hydro alternative which would eliminate Ketchikan's reliance on diesel fuel. The average 10-year cost of power for the Swan Lake project was estimated at 6.7 cents per KWH, compared to 7.8 cents per KWH for the Lake Grace alternative. The Mahoney Lake alternative was competitive with Swan Lake with a power cost of 6.7 cents per KWH, but the Mahoney Lake site would not generate enough power to replace all of Ketchikan's diesel generation. A summary comparison of the three projects is included in Appendix A, taken from the R.W. Beck report.

You also indicated an interest in whether the U.S. Borax mineral development at Quartz Hill was considered in the evaluation of alternative hydro projects for Ketchikan. It appears that the power requirements of the Borax development were not given significant consideration, for at least two reasons. When the Borax molybdenum discovery was first announced in 1977, Borax planned to meet its power needs by constructing its own hydro project at Wilson Lake (this plan was later dropped because of strong local opposition, due in large part to the high sport fishing value of Wilson Lake). In addition, the City of Ketchikan was primarily concerned with meeting the power needs of its residents, not of mining or other industries outside of the city.

R.W. Beck recommended that Lake Grace and Mahoney Lake be reevaluated as additional hydroelectric developments when the power output from Swan Lake nears full utilization. Lake Grace is now within the Misty Fjords National Monument, which may make future development of this site more difficult. The Lake Grace area was withdrawn under federal land classification at one time as a power project site, but is unclear whether this withdrawal was superceded by the National Monument designation.

Swan Lake

The Alaska Power Authority prepared the following brief history of the Swan Lake project, which is expected to begin producing power by January or February of 1984.

> The City of Ketchikan, having made the decision to discontinue its reliance on the use of diesel electric generation to meet rising energy demands, authorized the engineering firm of R.W. Beck in September of 1977 to investigate the feasibility of developing, as a major hydroelectric generating resource, the Swan Lake Project which is located approximately 22 miles northeast of Ketchikan near the northern end of Carroll Inlet in the central portion of Revillagigedo Island.
>
> In June of 1978, R.W. Beck issued a feasibility report indicating that a hydroelectric project which would demonstrate a benefit/cost ratio of 1.25 could be constructed at Swan Lake at a total investment cost of $80,924,000. Subsequently, the City of Ketchikan, Ketchikan Public Utilities (KPU) authorized R.W. Beck to proceed with preparation of final design of the project.
>
> The 1980 Legislature through joint resolution authorized the Alaska Power Authority to issue bonds up to the maximum amount of $120,000,000 for financing the construction of the Swan Lake Project.
>
> Construction was initiated by KPU in November of 1980. Funding for project design and initial construction was secured primarily through the proceeds of loans from the Power Authority's Power Project Revolving Loan Fund.
>
> On May 28, 1981, the Power Authority loaned KPU $35,000,000 for construction from funds which had been raised through the sale of General Obligation Bonds.
>
> On May 21, 1982, the Power Authority and KPU executed an acquisition agreement under which, in return for providing funds to complete project construction, the Power Authority will receive title to the project and as operation of the project [begins] will provide sufficient power for the City of Ketchikan's needs via a Power Sales Agreement.

The total construction cost for the Swan Lake project is now estimated at $93.5 million in nominal dollars. The target completion date is April 1984; however, the construction work is ahead of

schedule and the project may be completed as early as January 1984. Swan Lake will have an installed generation capacity of 22.5 megawatts and an annual firm energy production of about 70 million KWH. The project is expected to have about 50 percent utilization in its first years of operation; that is, about 35 million KWH of the 70 million KWH available will be used by Ketchikan Public Utilities. The year in which the full capacity of Swan Lake will be consumed depends largely on the rate of increase in future power demand, which is uncertain. However, current Power Authority projections show the project being fully utilized in about 2002.

Lake Tyee

I believe that you have seen a copy of my memo on the Tyee project to Representative Clocksin, dated February 11. Attached to that memo was a Tyee chronology prepared by the Power Authority which focused mainly on cost estimates. This chronology is also attached here as Appendix 2.

The Tyee project was originally proposed by the Thomas Bay Power Authority, a local Petersburg and Wrangell group. This group was first interested in the development of the Thomas Bay hydro site, but a reconnaissance study by the Corps of Engineers indicated that the smaller Tyee project was more feasible and cost-effective. Based on the Corps study, the Thomas Bay Power Authority dropped the Thomas Bay site in favor of the Tyee project. When the Alaska Power Authority became operational in 1978, an agreement was reached for the Authority to take over the development of the project and proceed with design and licensing work.

The Alaska Power Authority prepared the following brief history of the Tyee project.

> On December 19, 1979, the Alaska Power Authority submitted an application to the Federal Energy Regulatory Commission (FERC) for the construction of the Tyee Hydroelectric Project in the vicinity of Wrangell and Petersburg, Alaska. Our engineers, R.W. Retherford Associates/International Engineering Company (IECO), estimated the cost of the project at that time at $53,333,000, including an allowance for inflation at the rate of seven percent per year during the construction period. Procurement of long-lead-time turbines began in July 1981, in anticipation of a FERC license. FERC issued a license August 5, 1981, and the award of several additional procurement and one construction contract followed almost immediately thereafter.

The power-on-line date is scheduled for January 1984. The current estimate of the total project cost is $124 million. Available funds include $82 million in State grants and $50 million in interim financing.

The powerhouse is located in the Tongass National Forest, approximately 40 miles east-southeast of Wrangell, Alaska. The project is designed to develop the energy potential of Tyee Lake--a natural lake at Elevation 1396--convert it to electricity, and transmit the energy to the communities of Wrangell and Petersburg for distribution.

Tyee will have an initial generating capacity of 20 megawatts, expandable to 30 megawatts with the addition of a third generating unit. The project will be able to produce about 110 million KWH per year, of which about 34 million KWH (31 percent) is expected by the Power Authority to be sold to Petersburg and Wrangell in the first year of operation. Based on the Power Authority's estimate of 2.5 percent annual increase in power demand, the power output from the Tyee project will not be fully utilized until the year 2033.

I have also attached as Appendix C a memorandum by George Matz of the Office of Management and Budget which outlines the history of the Tyee project from the perspective of studies and approvals.

If you have any questions or would like more specific information on any of these hydroelectric projects, please do not hesitate to contact me. Also, I plan to complete a response to your research request on Swan Lake power rates (#83-89) by March 25. This analysis will compare projected power rates for the Swan Lake project with current power generation costs in Ketchikan and discuss alternatives for reducing Swan Lake rates, if necessary.

ALTERNATIVE HYDRO PROJECTS
SUMMARY OF CHARACTERISTICS

	Swan Lake Project	Lake Grace Project	Mahoney Lake Project
BASIN HYDROLOGY			
Drainage Area Above Dam, Sq. Mi.	36.5	29.2	2.05
Avg. Drainage Area Elevation	1,800	1,500	2,500
Avg. Annual Runoff at Dam Site, A.F. ...	335,000	279,000	33,500
Avg. Annual Runoff per Sq. Mi., cfsm ...	12.7	13.2	22.4
Max. Annual Runoff at Dam Site, A.F. ...	426,360	350,900	43,050
PROJECT POWER DATA			
Avg. Annual Energy Generated, GWh	88.0	105.2	49.7
Avg. Annual Energy at Load Center, GWh .	85.4	102.0	48.2
Annual Firm Energy Generated, GWh	68.0	93.3	29.5
Annual Firm Energy at Load Center, GWh .	66.0	90.5	28.6
Dependable Capacity at Load Center, kW .	18,000	25,000	9,000
RESERVOIR			
Normal Maximum Pool Elevation	330	500	1,956
Minimum Reservoir Elevation	269	458	1,776
Reservoir Area at Normal Maximum Pool ..	1,500	2,580	68
Active Storage Capacity, A.F.	86,000	150,600	7,150
DAM			
Type	Conc. Arch	Conc. Arch	None
Crest Elevation	344	509	-
Height Above Foundation, Feet	190	150	-

TABLE W-7

	Project SWAN LAKE	Project LAKE GRANE	Project MAHONEY LAKE
SPILLWAY			
Length, Ft.	100	200	90
Crest Elevation	330	500	1,956
POWER INTAKE	Single Level on Dam	Multi-Level on Abutment	Lake Tap and Valve Chamber
POWER CONDUIT			
Tunnel:			
Diameter, Ft.	10	9	-
Length, Ft.	2,250	3,400	-
Q Maximum, cfs	1,160	920	-
V Maximum, fps	14.8	14.5	-
Penstock (Steel):			
Diameter, Ft.	9	6.5	3
Length, Ft.	70	875	6,200
Q Maximum, cfs	1,160	920	86
V Maximum, fps	18.2	27.8	12.2
POWERHOUSE			
Turbines (Type)	2-Vertical Shaft Francis	2-Vertical Shaft Francis	2-Impulse
Speed, rpm	450	600	900
Net Design Head, Ft.	291	429	1,709
Rated Capacity, Best Gate, kW Total	22,680	26,700	10,600
Discharge at Avg. Head, cfs	1,014	855	78
Avg. Tailwater Elevation	8	27	88

(Continued)

	SWAN LAKE Project	Lake Grace Project	Mahoney Lake Project
TRANSMISSION LINE			
Voltage, kV	115	115	34.5
Length, Mi. (for New Line)	25	40	4
Type	Wood-Pole	Wood-Pole	Wood-Pole
ACCESS ROADS			
New Roads, Miles	1.0	3.6	7.0

ALASKA POWER AUTHORITY

334 WEST 5th AVENUE · ANCHORAGE, ALASKA 99501

Phone: (907) 277-7641
(907) 276-0001

February 9, 1983

Mr. Jack Kreinheder
House Research Agency
Pouch Y
Juneau, Alaska 99811

Subject: Tyee Hydroelectric Project-Summary of Estimated Total Costs

Dear Jack:

As per your request, following is a brief summary on the sequence of events on the Tyee hydropower project primarily relating to cost. The summary of Board actions was extracted from our corporate minutes. Most of the actions taken by the Board were based on advice from myself and my staff.

On December 19, 1979, the Alaska Power Authority submitted a revised application to the Federal Energy Regulatory Commission (FERC) for the construction of the Tyee Hydroelectric Project in the vicinity of Wrangell and Petersburg, Alaska. Our engineers, R.W. Retherford Associates/International Engineering Company (IECO) estimated the total cost of the project at that time at $39,590,000 (1980$'s). With an allowance for inflation and interest during construction the estimated total capital investment at that time came to $53,333,000.

In September 1980, IECO submitted a revised cost estimate of $50,976,000 (August 1980$'s).

Early in 1981, the Power Authority retained EBASCO Services, Inc., to prepare an independent cost estimate. EBASCO subsequently estimated the total project cost at $96,693,000 (May 1981$'s). Escalated to the midpoint of construction, this would represent a completed cost of approximately $110 million. After reviewing the EBASCO estimate, IECO conceded that its previous estimates were low and IECO raised its estimate to $81,069,000 (June 1981$'s). EBASCO refuted this revised estimate.

Procurement of long-lead-time turbines began in July 1981 in anticipation of a FERC license. The Board of Directors was realigned by Statute in the latter part of July 1981. The FERC issued a license on August 5, 1981 and the award of several additional procurement and one construction contract followed almost immediately thereafter.

IECO continued to make monthly reports on the status of the project, including estimated total project costs. It is important to note that by the end of March 1982, IECO had increased its project estimate to $97,072,000,

including engineering costs prior to construction. In the March report the overhead transmission line was estimated to cost $12,840,000 plus a $6,000,000 contingency. Less than two months later, during the bid opening for that contract, IECO provided an engineer's estimate of $23,280,887.00--an estimate that is 24 percent above any previous estimate, including contingency funds. The actual low bid was even higher at $24,901,466.

Starting with the IECO estimate from the March 1982, report, adjusting for the actual low bid on the transmission line, and adding the estimated cost for a proposed separate substation construction contract, the estimated total project cost was increased by IECO to $110,133,000 (May 1982). This did not include approximately $5 million for owner provided insurance. During the months that followed, the total project cost has decreased and increased, slightly, as adjustments have been made for actual bids on relatively small procurement contracts..

In December 1982, and again in January 1983, senior staff of IECO and IECO's parent company, Morrison Knudson (M-K), met with representatives of the Power Authority to discuss construction management of the project, including total project costs. The latest information from IECO is that the total project cost will not exceed $124,886,100. The Power Authority has asked the parent company, M-K, to completely review this estimate. A report from the M-K staff is anticipated the second week of March 1983.

A summary of Board actions, as extracted from our corporate minutes, is as follows:

October 4, 1978 Board receives report on Tyee Project indicating that, according to the reconnaissance study by Robert W. Retherford Associates, (RWR) the Project looks favorable and that Thomas Bay Power Commission (TBPC) will soon enter into contract with RWR for Federal Energy Regulatory Commission (FERC) work and that TBPC may request the Alaska Power Authority to take over the project.

November 18, 1978 APA Board voted to make $120,000 loan to TBPC for Tyee FERC work and this would supplement the $300,000 available from the Water Resources Revolving Loan Fund (WRRLF) in order to cover the $475,000 contract with RWR.

June 21, 1979 Board makes a loan to TBPC of $60,000 for Tyee Project. TBPC and Representative E.J. Haugen request the APA take over Tyee. The Board directed staff to bring information back at next Board meeting for Project take-over.

September 27, 1979 Tyee Letter of Understanding with TBPC adopted by Board.

November 2, 1979 Board authorized Executive Director to submit FERC license application. Also passed "stop-the-clock" resolution needed for bonding.

February 7, 1980 Board agreed to extend contract for advanced Engineering

and Design to IECO for Tyee but it was later decided with legal council to seek competitive proposals.

April 18, 1980 Board selects IECO for the Engineering and Design from among three proposals.

October 23, 1980 Board informed that costs have increased from $39,000,000 to $51,000,000 and has IECO explain to Board.

April 20, 1981 Board selects consultant panel as required by FERC.

May 14, 1981 Board awards Bids for Turbines.

July 6, 1981 Board considered awarding contract for Steel Towers and Conductors but defers "notice to proceed" until after opening of major Civil Contract so that the Board could get a better fix on the true cost of the Project.

August 18, 1981 FERC license has been received. Bids for Civil construction were reviewed as were the economics of the Project based on new cost estimates. Notice-to-proceed was given on Towers and Conductors. The Board was informed that existing funds were insufficient and that interim financing would be necessary. Board deferred action until the next meeting.

September 10, 1981 Board awards Civil Works contract to Southeast Harrison Western (SEHW) after lengthy debate.

October 2, 1981 Board informed on legal actions against Tyee construction contracts. Need for interim financing was discussed and indicated a proposal would be presented to the Board in December, 1981. Risk Management's desire to use "Wrap-up Insurance" on Tyee Project was discussed and actions that would be taken to effectuate such a program.

December 15, 1981 A Finance Plan was presented to the Board. It was recommended that the Board appoint a subcommittee to review the feasibility of the Tyee Project based on present knowledge of the costs. Commissioners Ward and Mueller and Dr. Weeden were appointed to the subcommittee. The Board moved that final financing documents for financing be prepared. The economics of the Project was reviewed.

January 22, 1982 Senator Dankworth and Representative Haugen addressed the Board and recommended proceeding with interim financing. Board authorized securing of $50,000,000 in interim financing. Board awarded a contract for Underwater Cables.

May 25, 1982 The Board awarded the Overhead Transmission Line contingent upon the Legislature not passing a piece of legislation that was being considered but that subsequently was not passed. Thus on June 3, 1982 the Executive Director informed the Board of his intent to issue the award for Transmission Tower construction.

October 22, 1982 The Board awarded contract for Transformers.

I trust this information is of assistance to you. If there is any further information you need, please call on me.

Sincerely,

Eric P. Yould
Executive Director

CC:
C. Conway
Comm. D. Lyon

MEMORANDUM State of Alaska

TO Gordon Harrison
Associate Director
Office of Management and Budget
Division of Strategic Planning

DATE February 23, 1983

FILE NO

TELEPHONE NO 465-3573

FROM George Matz GM
Division of Strategic Planning
Office of Management and Budget

SUBJECT Tyee Lake Project

There has been controversy recently regarding the Tyee Lake Project. The City of Petersburg has stated that the cost of power from the project is too expensive and they may not want to sign a power sales contract under the terms initially proposed by the Alaska Power Authority (APA). This situation has lead to an examination of other questions including the projects economic feasibility and the process by which this is determined. The purpose of this memo is to provide an historical perspective on the question of economic feasibility. The information in this memo should supplement rather than duplicate information in a February 9, 1983 memo from Eric Yould to Jack Kreinheder and a February 11, 1983 memo from Jack Kreinheder to Representative Don Clocksin.

The feasibility study for the Tyee Lake Project was completed for the APA in December of 1979. The statute at this time (AS 44.56.180) required the Office of the Governor to evaluate APA feasibility studies. Since the APA was in its infancy and the Tyee Lake Project was its first project to have completed a feasibility study, no formal review was undertaken.

In 1980, the Legislature passed an omnibus energy bill (Ch 83, SLA 1980) which amended requirements for APA reconnaissance and feasibility studies. This bill also requires the Division of Budget and Management (now Office of Management and Budget) to review these studies for statutory compliance and provide a recommendation to the Governor and the Legislature for feasibility studies. However, certain projects, including the Tyee Lake Project, had been previously approved by the Legislature and were exempted from review by the Division of Budget and Management. House Joint Resolution No. 62, which had been approved by the Legislature earlier in the 1980 session, stated that the general design of the Tyee Lake Project was approved and that the APA could incur $70,000,000 in revenue bond indebtedness to finance the project.

In 1981, the Legislature once again made significant amendments to the APA statutes (Ch 118, SLA 1981). One of the more significant amendments established a Power Development Fund to be used primarily for financing construction of State owned power projects. Restrictions were placed on the use of this fund. One of these restrictions (AS 44.83.394) states that "the authority may not use money in the fund for a power project except in compliance with AS 44.83.177-44.83.187 and unless the authority determines that the project is economically feasible."

Ch 90, SLA 1981 (which was the appropriation bill which accompanied Ch 118, SLA 1981) made appropriations to begin construction on three power projects. These projects, and the amount of their respective appropriations are Tyee Lake Project - $48,000,000, Swan Lake Project - $53,000,000, and the Terror Lake Project $81,500,000. Additional appropriations in the form of a loan, had previously been made to each of these projects. These loans were converted to grants by another bill Ch 91, SLA 1981.

Although each of these projects had completed feasibility studies and received legislative approval, AS 44.83.394 required a final review of the economic feasibilty of each project before the APA could make expenditures from the Power Development Fund. The statutes are not specific as to how the economic feasibility should be determined. The APA assumed that the feasibility assessment should be treated as an updated supplement to previous feasibility studies rather than repeat the entire process.

Apparently, the APA's first attempt at complying with AS 44.83.394 was an August 13, 1981 memo from Robert Mohn, Director of Engineering to the Record (see Attachment A). The information in this memo was presented to the August 18, 1981 meeting of the APA Board of Directors to demonstrate that even with more recent and higher construction cost estimates, the Tyee Lake Project was economically feasible at the "most likely" load growth rates. Following this presentation, the Board was asked to approve the award of construction contracts which would obligate funds in the Power Development Fund. It should be noted that this was the first meeting of a newly appointed Board of Directors and not all of the Board members were familiar with statutory requirements for power projects.

Ron Lehr, a Board member and Director of Budget and Management at that time, questioned some of the points used in the presentation and requested backup information. This information was sent to Budget and Mangement where staff found the information inadequate to make a determination regarding the economic feasibility of the Tyee Lake Project. APA staff was informed of this and responded in a September 10, 1981 letter with copies of the calculations used for the August 13, 1981 memo.

Budget and Management staff reviewed these calculations, found some technical errors, and requested that corrections be made in the analysis. Apparently, the request led to a decision by the APA to provide a more complete and adequate explanation of the economic feasibility of the project. The product of this effort was a "Findings and Recommendations" report that was completed on December 2, 1981 and distributed to the Board at its December meeting. This report fully explained the assumptions that were being used and provided enough details to review the economic feasibility of the project.

Although a review by Budget and Management of the "Findings and Recommendations" report was not required by statute, a review was undertaken for the benefit of Ron Lehr who's interest was both as a Board member and State Budget Director. Ron Lehr distributed this review to the Board at its January, 1982 meeting.

The Budget and Management review (Attachment B) questioned several assumptions and calculations used in the "Findings and Recommendations" report. The conclusion of the review is that the Tyee Lake Project may not be economically feasible based on the "most likely" load forecast but should be economically feasible if the actual load should exceed the "most likely" load forecast. Some of the more significant points brought out in the review are given below.

1) If and When - The economic feasibility analysis of a power project, particularly projects having a long life such as hydro power, should not only determine "if" the project is feasible but "when" is the most economic time to begin construction. A timing exercise of this nature was not done for the Tyee Lake Project even though such an exercise is most applicable to projects which have initial overcapacity, such as the Tyee Lake Project.

2) Reserve Capacity - Neither this economic analysis or cost of power calculation considered the cost of reserve capacity.

3) Load Forecast - The base year for the load forecast was higher than actual data. Also, the load forecast assumed an increase in electric space heating even though fuel oil appears to be a less expensive alternative.

4) Alternative - A number of smaller and less remote hydroelectric alternatives were not given detailed consideration. U.S. Army Corps of Engineers data indicates that some of these projects could have lower power costs than the Tyee Lake Project. Also, since all of the projects were smaller, overcapacity would not be a significant problem.

The load forecast in the most significant and perhaps the most uncertain parameter which applies to the economic feasibility of the Tyee Lake Project. Since the load forecasts were made a few years ago, we now have the benefit of hindsight to assess the accuracy of the first few years of the forecast. This information is presented below based on the "most likely" forecast for the "Findings and Recommendations" report and the "expected" forecast for the Feasibility Study. The Feasibility Study used 1978 as the last year of actual data. Neither of these forecasts, as presented, subtract out approximately 11,700 MWh of annual generation from an existing hydroelectric facility near Petersburg.

Energy Sales (MWh) for Wrangell and Petersburg

Year	Actual	Findings and Recommendations Report	Feasibility Study
1978	29,981	---	29,981
1979	29,087	---	31,445
1980	29,788	30,535	32,990
1981	29,222	31,726	35,275
1982	30,989	32,963	37,710

In summary, commitments to the Tyee Lake Project have been slightly ahead of establishing a more rigorous process for assessing the economic feasibility of proposed APA projects. Specifically:

1) the feasibility study for the project was completed before an independent review process was firmly established by the Legislature;

2) the Legislature approved the project without benefit of an independent cost analysis as now required by statute; and

3) construction contracts had been awarded before the "Findings and Recommendations" report had been completed and before the provisions of AS 44.83.394 has been met.

Anchorage Daily News Thursday, February 23, 1984

Four towns may agree soon on dams, APA director says

By DEAN FOSDICK
The Associated Press

JUNEAU — The head of the Alaska Power Authority said Wednesday the utility is near agreement on long-term power contracts with four of five communities in the "Four Dam Pool," but Petersburg is uncomfortable with the deal and will let the voters decide in a special election, a spokesman says.

Larry Crawford, APA executive director, told board members that negotiations continued until nearly midnight Tuesday with representatives of Ketchikan, Wrangell, Petersburg, Kodiak and Valdez.

"I think at this point it's probably a little more dialogue with the communities," Crawford said. "I think we're getting closer with four of them."

He indicated, however, that an "all or none" provision that had been carried through the contract talks be modified so the state could act in the place of any community excluded from the agreement — a reference to Petersburg.

The APA has embarked on a $462.5 million hydro program involving four new dams to supply power to the five coastal Alaska cities. The projects, either finished or near-finished, were built with $282.83 million in state loans and the rest in interim financing.

The agency has been trying to get the cities to sign power contracts so the state can refinance about $179.67 million in short-term loans that begin coming due this year. The resulting long-term revenue bonds would be used for paying project costs not covered by grants.

But the cities have resisted, contending they'll not sign contracts until assured that hydro costs don't overly exceed what they now pay for diesel.

They also contend that the "Susitna Blackmail Clause," which was tacked on by the legislature, would increase consumer rates by as much as 50 percent.

The clause states that if $5 billion is not appropriated by 1991 to build two hydroelectric dams on the Susitna River to serve Southcentral Alaska, state grants to other projects would have to be repaid at a rate of 10 percent annually.

Jim Fillingame, manager of the Copper Valley Electric Association Inc. at Glennallen, said customers in the Valdez area served by the new Solomon Gulch Dam were promised two years ago they'd be getting "good, cheap electric power."

"It was no little job to sell the program to the people," Fillingame told APA directors. "Now, I've got to go back and tell these same people that good hydro power will cost several cents more per hour than what we can generate by diesel."

Proposed "entry costs" for that utility would mean about a 40 percent increase for large power users and a 22 percent rate hike for residential users, he said.

Wrangell representatives, meanwhile, said that city was about a week away from making a decision on the proposals.

David Neese, general manager for the Kodiak Electric Association, said that community was ready to agree to the deal.

Ketchikan Public Utility Manager Rick Newland said, "We're very close to agreement on the major issues. There are several yet to be resolved but the groundwork is there to reach resolution."

But Richard Underkofler, Petersburg city manager, told a reporter that city has problems with the entry rate and system increment issues.

"We're about $1.5 million away on their assumption of what the difference between what diesel and hydro costs would be," he said. "That's for the life of the program so it's really not that broad.

"But the system increment issue is philosophical," Underkofler said. "The power authority will have a license to increase our rates over the term of the agreement to pay for its endeavors elsewhere. It's our feeling we should be released from further debt service if we pay off our loans.

684
S89

Alaska Power Authority
Commissioner: D Lyon
Executive Director: Lary Crawford

Board meeting, 22 February 1984

Power Sales agreements;

1. Copper Valley: close to an agreement. Jim Billingame, manager of utilitiesstates that he shows some concern of confronting his public with a cost not seen before. Presently Glennallen diesel generation is .06 PKH and proposed APA power will be .07 PKW. This constitutes a 40% increase to some. Valdez is an emphatic NO! Average monthly consumption in Glennallen is 340 KWH and translates to $90 per month, while Valdez is running an average monthly bill of 550 KWH or $151. per month. A 40% increase can be devastating.

2. Wrangell: Matt Cole (position unknown) will be taking power sales agreement to city council Thursday night (Feb 23rd) for consideration. He says discussion (informal) with council members appears good and contract may be forthcoming.

3. Kodiak: David Neese, Mgr of Muni-power. Municipality has agreed to purchase power from APA. Two suggestions: possible loans to consumers and the establishment of an advisory board.

4. Ketchikan: Rick -?--. mgr of utilities says it looks very good, contract in the making with questions as to wording of legal documents.

5. Petersburg: NO!

Management study (status report) presented by Roger McMannus of Mead consultants for FY 84, FY 85, FY 86.

Presently APA employes 69 persons

Executive Dept----------4
Planning ---------- 9
Projects ----------18
Operations ---------- 7
Finance-Administration ---31

APA is asking for an immediate increase of 16, 17 more FY 85, and an additional 9 for FY 86 to total 111 persons.

1934 Susitna contingency fund: 3.18 Million dollars
Drilling request (wantana dam) 1.9 million. if approved this will leave in the contingency fund 1.28 million.

Competitive bidding on Watana Dam drilling will be let 27 Feb 84 with awarding of contract sometime in mid April 84.