

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILES 86/2

979 SCOMM44: HOUSE POWER ALTERNATIVES STUDY COMM. 1979-80 979

Project financing --- if attainable --- carries two advantages for sponsoring utilities: (1) the debt ratio can be comparatively high (70 to 100 percent), and (2) the debt is secured by means other than placing the assets of the parent companies (or the full faith and credit of the governmental sponsor) on the line. It virtually absolves the sponsoring companies from carrying any business risks beyond contributed equity capital, if any. Moreover, because the debt does not appear on the sponsors' balance sheet, they can use project financing to sidestep provisions in their existing debt obligations that would otherwise limit their ability to incur further debt.

Project financing is not, however, a means of shifting construction, operating, or marketing risks to the lenders. All such risks must be assumed by some other party or parties at least as firmly as the sponsors would have assumed them in a conventional financing. There are essentially two methods of securing debt without recourse against the sponsors --- guarantees from consumers, and guarantees from governments or other third parties.

The first approach relies on revenues from project customers, secured by "all-events", "minimum-bill", "take-or-pay" contracts, whereby the wholesale customers (Alaska utilities) bind themselves to pay the costs of operation and maintenance, interest and the scheduled repayment of principal --- however high those charges may be, and whether or not the service or product is actually delivered. There are three preconditions for this kind of project financing:

1. Distribution utilities must be willing to sign all-events, minimum-bill, take-or-pay contracts, in advance of construction, obligating themselves to pay all of the project's debt service and operating costs, however high those costs might be.

2. The Alaska Public Utilities Commission (APUC) must have the legal authority, and use that authority, to assure in advance that those contract obligations will be "perfectly tracked" into the bills of the final electricity consumers, no matter how great the charges may be.

3. Lenders must be confident, despite these contractual and legal assurances, that an adequate market exists for the power, and that the bills paid by final consumers will in fact be enough to meet the utilities' contractual obligations to the project entity (along with their other obligations).

These conditions are not implausible, but they are exceedingly demanding. If they can not be met, a non-recourse (revenue bond) project financing will be impossible, and capital can be raised for plant construction only by means of general obligation bonds or some other form of state loan guarantee, or by direct governmental financing.

Construction financing. Take-or-pay contracts do not normally take effect until projects are complete and operating. There is little chance that private lenders will agree to assume the risk that a major Alaska power project will not be completed, will be completed only after an extended delay or, if completed, will not work properly. Thus, while the three assurances described above might attract financing of post-construction long-term debt, it will be far more difficult to find lenders who are willing to carry the project over its construction period.

There are only two parties capable of securing the construction debt of a large project-financed generating

plant in Alaska: final consumers and the state government. The preconditions for consumer guarantees of construction debt are even more demanding, and considerably less probable of achievement, than those for securing long-term debt by means of take-or-pay contracts:

1. The utilities that contract to buy power from the project entity must agree to pay interest and to begin repaying the principal on all funds used for "construction work in progress" (CWIP) during the entire construction period. This arrangement is in contrast to the more conventional one in which all pre-operational costs, including interest on construction debt (the "allowance for funds used during construction" [AFUDC]) are "capitalized," with all charges to customers postponed until the facility begins operating.

2. The APUC must have the authority, and must use that authority, to assure that these pre-operational charges are perfectly tracked into final consumer bills, despite the fact that consumers might not receive any electricity from the project for ten or more years (if ever).

3. Lenders must be confident, despite these contractual and legal assurances, that the existing market for electricity in the Railbelt can bear the additional charges, and that the bills paid by final consumers will in fact be enough to meet the utilities' contractual obligations to the project entity in addition to their other obligations.

We have not rigorously calculated the expected impact of this method of financing on consumer electric bills, but in the case of the Susitna project it would likely double or triple the average cost of electricity to Chugach Electric

Association customers over the entire period of ten years or more before they even began to receive Susitna power. Consumer bills after the facility went on line would be correspondingly lower because much of the project's capital cost would already have been paid. This attraction, however, probably would not be sufficient to override the consumer outcry against taking on huge price increases now.

The implication of the foregoing is that construction of the Susitna project, or any generating facility of comparable size in Alaska, is unlikely to be financed without some kind of government loan guarantee or direct government investment.

CHAPTER III: HISTORY OF THE SUSITNA PROPOSAL

During the first half of the Twentieth Century, hydro-electric generation (with its high reliability and its freedom from recurring fuel costs) was the preferred source of electricity wherever suitable damsites existed. One of the chief missions of the Interior Department's Bureau of Reclamation was to identify potential hydropower sites, particularly on the Western federal lands.

Origins of the Susitna project.

Alaska's rivers were included in the federal site identification program, but they were too remote from the continent's population centers to draw much attention during the federal dam-building programs of the 1930's. Major developments, instead, centered on the Tennessee, Columbia, Colorado and other Lower 48 river systems. Federal interest in Alaska's hydropower potential was almost nonexistent until the late 1940's.

[In 1950,] the Department of the Interior provided \$150,000 to be used by the Bureau of Reclamation to update its Alaskan investigations of 1948. The results of these studies were to be used as a basis for legislation authorizing the development of the territory's water resources.

In its final report, published in 1952, the Bureau of Reclamation identified a large number of possible hydro-electric power sites throughout Alaska. The Bureau pointed out that, among all the potential rivers, the Susitna River was the most strategically located of all Alaska streams because of its proximity to Anchorage and Fairbanks and the connecting railbelt. [Naske & Hunt, 1978]

The Bureau of Reclamation report identified three Susitna River damsites as having special potential --- Vee, 17 miles below the mouth of the tributary Tyone River; Watana, 36 miles downstream; and Devil Canyon, 28 miles

further downstream. In view of the still-limited demand for electricity in the region, however, Congress only authorized construction of a smaller dam closer to the Anchorage load center: the Eklutna project, which was completed in 1955.

Bureau of Reclamation interest in the Susitna continued nevertheless, with release of a feasibility study in 1960 that favored a two-dam project at Devil Canyon and Denali; a site between Vee and Watana, about 10 miles below the Susitna River Bridge on the Denali Highway. In 1961, the Interior Department recommended Congressional authorization of this project with transmission lines to move Susitna power to both Fairbanks and Anchorage.

The Army Engineers' Rampart proposal.

About the same time, however, a rival project promoted by the Army Corps of Engineers and the Alaska Congressional delegation began to draw off much of the political support for Susitna development both within Alaska and in Congress. Advocates of the gigantic Rampart Dam on the Yukon River successfully persuaded Congress to defer action on the Susitna concept until studies of Rampart were completed.

Although Governor Egan, two major Railbelt utilities, the Anchorage Daily News and the Fairbanks News-Miner, the Alaska Chapter of the National Electric Contractors Association, and the Alaska Conservation Society all preferred the Susitna development, the Corps of Engineers and Senator Ernest Gruening captured the public's interest for the much more dramatic Rampart project throughout the mid-sixties. A recent review of Rampart's political history by Klaus Naske and William Hunt [1978] concluded that obsession with the grandiose and unrealistic Rampart scheme delayed serious consideration of the Susitna by more than a decade.

A 1967 report by the Interior Department effectively eliminated Rampart as a contender, finding that the project was neither economically nor environmentally sound. Instead, Interior recommended creation of a power pool that would interconnect the Cook Inlet and Interior Alaska load centers, and construction of new gas-fired plants in the Cook Inlet area and a mine-mouth coal-fired plant at Healy. For the longer-term it recommended further consideration of hydroelectric projects on the Susitna River and at Bradley Lake near the head of Kachemak Bay.

By the time that Interior issued its report, two organizational changes had occurred that affected the outlook for the Susitna project. First, the Army and Interior Departments, responding to Congressional annoyance about their competitive posture on river-development schemes, agreed to end their rivalry. The lead in hydropower policy and research was to be located in the Bureau of Reclamation (Interior), while design and construction responsibilities went to the Corps of Engineers (Army).

Creation of the Alaska Power Administration.

Subsequently, in 1967, the Interior Department withdrew the Bureau of Reclamation from Alaska entirely, and transferred its duties to the Alaska Power Administration (now part of the Department of Energy, and not to be confused with the state's Alaska Power Authority). The new agency is charged with forecasting electricity demand, and planning water resource development and electrical transmission facilities. The Administration also operates and markets power from the existing Eklutna hydroelectric installation near Anchorage and the Snettisham project near Juneau.

New federal interest in Susitna.

In 1972, the U.S. Senate Public Works Committee, of which Alaska's Mike Gravel was a member, passed a resolution requesting the appropriate federal agencies to assess the electricity needs of Alaska's railbelt area, and to take a fresh look at development of the Upper Susitna. In 1974, the Alaska Power Administration responded with an update of the Bureau of Reclamation's 1961 report and again recommended construction of a two-dam system, using the Denali and Devil Canyon sites.

In 1976 the Corps proposed to proceed with Phase I of the project's engineering and design on the basis of the 1974 studies. That year, Congress authorized \$25 million for the Phase I effort, conditional upon "notification to Congress of the approval of the Chief of Engineers." All the required procedures for this approval had been completed by May 1977, when the office of Budget and Management (OMB) blocked the expenditure, insisting instead on supplementary geological, engineering, and economic studies. The Corps issued its supplemental report in February 1979; OMB approved it, and in the summer of 1979 the Corps forwarded it to Congress, where it is still under consideration.

State initiatives: The Kaiser proposal and establishment of the Alaska Power Authority.

Meanwhile, the State of Alaska had begun to consider independent initiatives to advance Susitna hydropower development. The state contracted for an economic and engineering feasibility study with the Henry J. Kaiser Company, which was considering Alaska locations for a major aluminum refining plant. Kaiser's 1974 report proposed a wholly different construction strategy, composed of a higher

dam (Susitna I) about five miles upstream from the Devil Canyon site recommended by the Bureau of Reclamation and the Corps of Engineers, with smaller dams downstream (Olson) and upstream (Vee and Denali), to be built later. This concept appears to have no active support today.

The 1976 session of the Alaska Legislature created the Alaska Power Authority (to be distinguished from the federal Alaska Power Administration) as a vehicle for direct state initiatives in the design, financing, construction and operation of a Susitna hydroelectric project or other electrical generating and transmission facilities in the state.

The Authority was empowered to conduct engineering, economic, and financial feasibility studies; finance power projects directly through issuance of revenue bonds; lend to existing utilities or regional power authorities through a power project revolving loan fund; and contract with producers for the purchase of electricity. While legislation creating the Authority was enacted in 1976, it did not get any staff or funding until 1978.

Senator Gravel's funding proposal.

In 1976, the Susitna development was not moving very rapidly on the federal level. Moreover, Alaska's Senator Mike Gravel was concerned that Congressional attitudes toward federal power were changing and that the time was quickly running out on the practice of appropriating vast amounts of money for river-development projects whose benefits were wholly local. The Susitna proposal was clearly in this category: It would require a large portion

of total federal outlays for power development to an oil-rich state, for the benefit of as little as one-tenth of one percent of the nation's population --- and in the richest state in the nation, to boot.

Senator Gravel argued the urgent need for a break with tradition. Alaska must rely upon another means of financing hydroelectric projects. The senator proposed that Congress appropriate monies to a revolving fund equal to the phase one or the advanced engineering and design portion of any one project. The sponsoring state agency, in this case the Alaska Power Authority, soon to be created by the state legislature, would issue bonds based on the proposed project to pay the Corps for the phase-one work.

In the event that the proposed development was not feasible, the federal revolving fund monies would be used to pay off the state bonds. If, however, the proposed project proved to be feasible, the Alaska Power Authority would issue revenue bonds and contract for the work. Under the Gravel plan, the federal revolving fund would act solely as a guarantee for the phase-one costs incurred by the state sponsor. [Naske and Hunt, 1978]

Current investigations.

The Gravel proposal as such was not adopted by Congress, but Phase I work for Susitna was conditionally authorized in the Water Resources Development Act of 1976. The Act did incorporate Gravel's concept of a cooperative federal-state effort in detailed feasibility studies, and required the state to reimburse the federal outlay for Phase I if the project proved feasible.

As an alternative to executing a cooperative agreement with the Corps of Engineers, the state had the option of arranging for and financing its own studies. The creation of the Alaska Power Authority in 1976, combined with suspicions in Alaska that the federal government was both out of sympathy with Alaskan goals and unable to move with dispatch or competence, led the state legislature to appropriate

\$8.17 million to the Authority in 1979 for a series of feasibility analyses and design studies that may ultimately cost more than \$50 million.

The Acres study.

The Alaska Power Authority treated the Corps equally with three private consulting firms as competitors for the Phase I effort. In November 1979, nevertheless, the Power Authority contracted for the studies with a private group led by Acres American, Inc. of Buffalo, N.Y. and Columbia, Maryland. Acres' subcontractors include ---

- *** R & M Consultants of Anchorage (geotechnical field studies);
- *** Frank Moolin & Associates of Anchorage (construction management);
- *** Terrestrial Environmental Specialists, Inc., of Phoenix & New York (environmental assessment);
- *** Woodward-Clyde Consultants of Anchorage & San Francisco (seismic studies);
- *** Salomon Brothers of New York (financial advisors); and
- *** Cook Inlet Region, Inc., and Holmes and Narver, of Anchorage (logistical support).

Work began in January, 1980, and will continue for about 30 months. There is no guarantee that the engineering, environmental, and economic findings will be favorable. Further, even with the most positive study conclusions, the state and federal permitting process would take another three to five years before construction could begin.

Chapter IV of this report summarizes Acres' February 1980 Plan of Study, identifies some weaknesses in the Plan, and proposes some modifications to it.

The legislature's study of alternatives to Susitna, and this report.

In 1979, the Alaska legislature, fearing the attention and funding devoted to the Susitna project would obscure potential alternatives, which might be more economical or less environmentally disruptive, appropriated \$200,000 to the Division of Legislative Research to "(1) analyze existing assumptions and findings concerning power needs and population growth projections of the Railbelt . . . [and] . . . (2) analyze energy supply alternatives, including Susitna . . ."

When the research division was disbanded in the Summer of 1979, the House of Representatives established a Power Alternatives Study Committee, composed of Representatives Brian Rogers and Hugh Malone, to oversee this appropriation. [The Committee funded the present report out of the \$200,000 with a \$25,000 contract to Arlon R. Tussing and Associates, Inc.]

The Alaska Power Authority subsequently augmented the legislative appropriation with \$30,000 to increase the scope of a power market demand study for Acres by the Institute of Social and Economic Research, so that ISER might consider end uses of energy in Alaska.

CHAPTER IV: THE ACRES PLAN OF STUDY

Introduction

In February 1980, Acres American, Inc., published its Susitna Hydroelectric Project Plan of Study. This document is the refinement of a preliminary plan that Acres submitted to the Alaska Power Authority in September 1979, in the firm's original study proposal. Eric P. Yould, executive director of the Power Authority, introduced the Study Plan "to the public at large and all interested agencies and organizations," stating:

1. The fact that a feasibility study is to be undertaken does not necessarily mean that a hydroelectric project of any kind will ever be constructed on the Susitna River. It will provide the basis, however, upon which an informed decision can be made as to whether the State could or should proceed in the matter.

2. The publication of this plan does not permanently fix the manner in which the proposed work is to be accomplished. On the contrary, I regard it as a dynamic document which will, I hope, be steadily improved with your assistance. It has already undergone an important metamorphosis as a result of testimony and correspondence received during the past four months, and I have no doubt that further editions will be responsive to your suggestions and comments.

In line with the Power Authority's request, the Alaska House of Representatives' Power Alternatives Study Committee contracted with Arlon R. Tussing & Associates to review the Acres Study Plan, in order to propose further improvements. After examining the February 1980 document, the reviewers concluded that the plan needs serious changes in its emphasis and in the scheduling of its study tasks if it is to serve as the basis for informed decisions by the state. This chapter briefly summarizes the Study Plan, identifies those shortcomings in subject areas that we are competent to address, and proposes a number of amendments in the substance, funding level, and sequence of study tasks.

General description.

The \$30 million Acres American, Inc., study plan is intended to establish the technical, economic and financial feasibility of the proposed Susitna hydroelectric project for meeting the future power needs of the Railbelt region, and to evaluate its environmental consequences. If the Alaska Power Authority determines that the venture is feasible, Acres and its subcontractors would prepare a license application for submission to the Federal Energy Regulatory Commission.

The study itself is scheduled to take 30 months and involves a multidisciplinary team of consulting firms:

- *** Woodward-Clyde Consultants --- power studies and seismic analysis;
- *** Salomon Brothers --- financing plan;
- *** R & M Consultants --- hydrologic investigations;
- *** Frank Moolin & Associates --- project and construction management;
- *** Terrestrial Environmental Specialists --- environmental assesement; and
- *** Cook Inlet Region, Inc., and Holmes and Narver --- logistical support.

The project team will undertake essentially thirteen tasks as follows, at a total cost of \$29,604,249:

1. Power studies --- demand forecasts, generation alternatives, expansion sequence and plant mix, and impact assessment. (\$359,200)
2. Survey and site facilities --- land tenure and jurisdictional analysis, field studies and surveys, aerial photography and mapping, and access roads. (\$7,858,600)

3. Water resource studies --- development of stream flow data; reservoir operation; glacial movement, flooding, ice, sedimentation, etc. (\$1,826,000)
4. Seismic studies --- seismic risk analysis, and development of seismic design criteria for dams, transmission lines and access roads. (\$1,139,000)
5. Geotechnical exploration --- data collection and analysis for surface and subsurface geology and geotechnical conditions. (\$3,620,500).
6. Design development --- development of preliminary engineering design and cost information for Watana and Devil Canyon damsites. (\$1,769,000)
7. Environmental studies --- assessment of alternatives for power generation, access road and site facility locations and power transmission corridors; preparation of FERC license application exhibit. (\$6,570,300)
8. Transmission --- selection of transmission route, preliminary engineering designs, and cost estimates. (\$729,300)
9. Construction cost estimates and schedules --- cost estimate summaries and construction schedules suitable for the application to FERC; analysis of possible delays, changes and their effects on costs and schedules. (\$185,000)
10. Licensing --- preparation and assembly of all necessary documentation for the application to FERC. (\$293,500)
11. Marketing and financing --- examination of financial feasibility and development of a financing plan. (\$383,100)
12. Public participation --- establishment of a public information office; conduct of public workshops and meetings; and preparation of information, materials, and action lists. (\$383,000)
13. Administration --- project management. (\$467,700)

Information for decision-making.

The Study Plan assumes that the Power Authority will base a choice between the Susitna project and one or more alternatives on the findings of a Power Alternatives Study Report to be completed 11 months into the overall study, containing ---

- "load forecasting for the Railbelt region;
- "selection of alternative energy and/or power generation scenarios;
- "evaluation of viable expansion sequence scenarios; and the
- "recommended expansion sequence."

This first phase of the study is thus its most vital element from the standpoint of deciding whether or not the state should concentrate its efforts on developing the hydropower potential of the Susitna River or pursue other alternatives in earnest. Unfortunately, this phase seems to be both the most superficially considered part of the Acres plan, and the least adequately funded, accounting for only 1.2 percent of the total study budget (\$359,200).

The gravest defect in the current plan of study is the fact that neither Acres' findings nor the Power Authority's decision regarding Susitna's viability would be based on its economic or financial feasibility. This is not a fault that Acres or the Authority can remedy simply by providing more funds or a more sophisticated work plan for some of the study subtasks but is, rather, one that demands an overhaul of the organization and scheduling of the study as a whole.

As it now stands, the Acres plan proposes to choose among alternative generation strategies before making any cost, scheduling, or contingency analyses of the Susitna project itself. The contractors would not begin making even preliminary cost and scheduling estimates for the

project until the 73rd week --- five weeks after all other alternatives have been rejected --- nor does it begin to consider "potential contingencies/risks and to evaluate their effects upon cost estimates and schedules" until the 115th week. The study plan, moreover, would begin considering the marketability of Susitna power and the project's financibility only after the Power Authority had made a decision to proceed.

The contractors would look at cost and risk comparisons for alternative methods of electric generation (to Susitna) in the power alternatives study prior to the go/no-go decision, but according to the plan information on even the alternatives would be "developed for each technology (cost/unit energy) based on . . . existing studies." [emphasis added] The sources that the plan explicitly references are 1976 documents, while the whole work tasks of analyzing alternative power generation strategies and determining the optimal plant mix account for only 4/1000 of the total project budget (\$126,000). Even if this information on alternatives were adequate for making a choice among them, it is hard to see what use it would be in the absence of cost, scheduling, and risk estimates for the Susitna project itself.

Demand studies.

The "need" for Susitna power, its marketability, its cost to consumers, and the project's financibility all depend upon the total amount of electricity demanded by residential, commercial and institutional, and industrial consumers in the Railbelt. In order to choose the best combination (or indeed, even a workable combination) of generating facilities, power system planners need to know two dimensions of future demand: (1) the total demand for

electrical energy, which is usually measured in megawatt-hours over the course of a year, and (2) the peak load, which is the highest number of megawatts demanded at any time during the year.

In the Acres plan, the Institute of Social and Economic Research of the University of Alaska (ISER) will prepare forecasts of total demand, while Woodward-Clyde Consultants are to produce peak power demands and load duration curves "in a manner which is consistent with the economic, social, political, and technical assumptions made by the ISER when developing their energy consumption forecasts."

ISER's demand scenarios. This report does not review or criticize the scope or methodology of the ISER study. It is important, however, to recognize one crucial limitation of the "scenario" approach to demand projection used by ISER and most other forecasters. The scenario method uses an economic model to produce results that are consistent with some set of assumptions about (say) future oil discoveries or petrochemical development in Alaska, world energy prices, federal regulations regarding the end-uses and pricing of natural gas, and the like. But the scenarios themselves will say nothing about the truth or even the likelihood of such assumptions, and most forecasting technicians hesitate to express strong opinions on their truth or likelihood.

Using the scenario method, therefore, ISER will surely present several forecasts of future electricity demand, some of which will seem to argue in favor of, and others against building the Susitna project, but Acres and the Power Authority will have to decide which, if any, of these forecasts they should take seriously in planning new electrical

generating facilities for the Railbelt. If a rational decision is ever to be made, in other words, somebody ultimately must (1) make an implicit or explicit judgment which scenario describes Alaska's future most plausibly, and (2) be prepared for that judgment to turn out quite wrong.

In our judgment the most likely scenarios for the state's future are ones that no recent power demand forecast (including ISER's 1976 study) has even mentioned, let alone formally considered: scenarios in which no combination of existing and new basic industries can equal or replace government revenues from Prudhoe Bay oil and gas as a source of Alaska income and employment. In these scenarios, the inevitable decline in Prudhoe Bay production will mean that the Railbelt's business activity, employment, population --- and electricity demand --- will peak in the late 1980's or early 1990's, and fall sharply for at least several years.

We do not expect the Alaska Power Authority to agree with our judgment that this is the most probable course for Railbelt electricity demand, but it is vital for power planners in Alaska to recognize that it is a wholly plausible course, and to consider the implications for the State of a decision to build Susitna if power demand did actually begin to decline at just about the time the project was completed.

It would be a relatively simple matter for ISER to add one or more boom-and-bust scenarios to the demand forecasts if such scenarios are not already part of ISER's program. Our more serious concern is that the Study Plan does not seem to deal systematically with any kind of uncertainty or risk (demand forecasting errors, delay or non-completion risks, construction cost overruns, uncertainties regarding

the availability of alternative fuels, or interest rates and other financial risks) in choosing among different strategies for providing electricity to the Railbelt.

Forecasts of peak loads and load duration curves.

The amount of generating capacity a region requires in a given year stems directly from (1) the need to meet the highest anticipated peak load for the year, and (2) the need for sufficient reserve capacity to serve unanticipated peaks, while allowing for scheduled and unscheduled equipment outages. Estimates of total annual requirements for electrical energy by themselves reveal very little about the need for peaking and reserve generating capacity.

A utility's total energy demand and its peak demand are both functions of population, per capita income, climate, the regional industrial mix, and the like. Its load factor --- the ratio between the average annual demand for electrical energy and the annual peak load --- also depends on all of these variables, and moreover, can be powerfully influenced by the utility's rate structure, and by various "load management" measures. While the Study Plan discusses a number of arcane theoretical issues in the forecasting of load duration curves, the meager funding for this subtask implies that Woodward-Clyde must derive its peak load forecasts and load duration curves from ISER's projections of annual demand for electrical energy, on the apparent (and unwarranted) assumption that peak loads and load patterns are are a relatively simple function of total demand.

The total annual demand for electrical energy can always be derived from a load duration curve, but Woodward-Clyde will not be able to make forecasts of future load

duration curves or peak loads consistent with ISER's assumptions without working from the original data and methodology for each of ISER's scenarios --- in other words, without repeating ISER's work and adding new analyses to it. But the Acres study plan provides only \$43,700 for this effort. No credible forecast can be produced for this sum, and we do not believe that any credible firm would offer to produce one for this amount.

Peak-responsibility pricing and load management.
Peak-responsibility pricing and other techniques of load management can reduce costly peak loads, enhance the operating efficiency of base-load generating capacity, and provide a partial substitute for reserve generating capacity. While these measures are relatively novel in the United States, European experience suggests that they can reduce the need for total generating capacity by 20 to 30 percent, and thereby postpone the need for new investment for several years.

Conceivably, peak-responsibility pricing and load management might eliminate any need in the foreseeable future for new large-scale generating facilities to serve the Railbelt, and at the same time spare consumers large rate increases necessary to help finance new construction. Federal law now requires utilities and the federal and state agencies that regulate them to consider such measures, and the failure of the Susitna planning process to give them sufficient attention could, at the very least, jeopardize or delay the project's ultimate approval. The Acres plan does consider rate design and load management, under the heading of "non-hydro alternatives," but as with peak-load forecasting, their placement and funding level suggest that they are being treated only as an afterthought or parenthesis, rather than as central issues in assessing the need for new generating capacity.

Selection of new generating facilities.

Acres plans to combine the ISER and Woodward-Clyde demand forecasts with existing capital and operating cost estimates for various power alternatives (but not, apparently, for Susitna itself), by means of a mathematical model that will " . . . determine the total system costs of selected future Railbelt expansion sequences, both with and without incorporation of the Susitna Hydroelectric Project, and rank the preferred generation expansion scenarios . . ." according to the cost of electricity.

The program Acres has selected for choosing among the various generation strategies would combine " . . . system reliability evaluation, operations cost estimation, and investment cost estimation." Even the most sophisticated, state-of-the art planning model of this type would be wasted, however, on the incomplete or questionable information inputs Acres intends to process. In the context of the current study plan, therefore, the model's output will be of little use to the state in making an informed decision on Susitna. The fact that Acres plans to spend only one-tenth of one percent of the project budget (\$30,000) for the systematic comparison of generation alternatives is a dramatic signal of the contractor's lack of regard for the entire power alternatives study task.

Financial Feasibility.

As we pointed out earlier, the current Acres plan would begin to consider the marketability of Sustina power and the project's financial feasibility only after the Power Authority had made its decision whether or not to proceed. Even so, the plan's approach to financing is based upon two

assumptions that are doubtful at best and which, in any case, warrant a close and early examination. The first is that the Susitna project can be financed by revenue bonds (preferably tax-exempt), and the second is that the electric utilities of the Railbelt will voluntarily enter into full-cost-of-service take-or-pay contracts for Susitna power with the Alaska Power Authority.

In recent years, a substantial number of electrical generation projects (fossil-fueled and hydro, as well as nuclear) have foundered in mid-construction because of design faults, poor management, revised demand forecasts, or legal and regulatory hurdles. It is not surprising, therefore, that financial institutions are reluctant to buy bonds whose only security is project revenue. There has never actually been any utility venture as large as the Susitna project whose construction has been project-financed entirely, or even as much as 75 percent, with non-recourse debt (that is, with revenue bonds). While there have been many attempts at such financings, sponsors in each case have had to choose between pledging their "full faith and credit" (that is, by selling general obligation bonds), finding third-party guarantors, or abandoning the project. This has been the case even for projects of proved design in familiar environments, facing guaranteed markets.

Rightly or wrongly, lenders are bound to perceive the Susitna project as bearing even greater risks of non-completion, extended delays, cost overruns, or market deficiencies than the Lower-48 projects they have already declined to finance on a non-recourse basis. Moreover, since Salomon Brothers first reported to the state on possible methods of project financing for the Susitna proposal, inflation has severely damaged the bond markets; and unless economic

conditions improve radically between now and the time a Susitna financial plan is completed, debt in the quantities it requires may be unavailable at any price, on any terms.

Thus, it is very likely that the state will be faced with the choice between financing Susitna with a direct appropriation, guaranteeing the project's bonds, or compelling Railbelt power consumers to begin paying for Susitna's enormous capital costs in their electric bills many years before they receive any power from the project. It is probably imprudent to count on selling revenue bonds as the principal means of financing Susitna and even more imprudent to assume that the costs or availability of financing will not influence the project's viability or merits. Although we are considering a facility project whose completion is at least ten years away, the feasibility of project financing may indeed be an important consideration in choosing a power supply strategy for the Railbelt.

Marketability.

The second assumption, concerning the utilities' willingness to enter into take-or-pay contracts, should not be taken as given. Railbelt utilities are not a single entity, and unless the legislature is willing to impose Susitna power on reluctant utilities and their customers, the Alaska Power Authority will have to negotiate individual contracts with each utility. Non-recourse financing, moreover, would require all-events contracts (compelling consumers to pay for Susitna whether or not they ever got Susitna power, and no matter how much it turned out to cost) prior to construction. Since Susitna power is likely to be more expensive than conventional Railbelt power generation, at least at the outset, the Power Authority could face a

buyer's market, especially if gas prices remain relatively low or if Beluga coal development proves economically feasible.

Chugach Electric Association is by far the biggest electric utility in the Railbelt, and its service area together with the service areas of its wholesale customers encompasses the region in which most of the future growth of population and power demand in Alaska is likely to occur. Susitna power may or may not be the lowest-cost alternative for Chugach customers, but it is very likely that, absent Chugach and its customers, Susitna power will not be marketable or financially feasible and that, as a result of the project's underutilization, it would not be the lowest-cost alternative for anybody.

Chugach Electric Association has not thus far been an enthusiastic backer of the Susitna project, and its management is not now convinced that Susitna power is the lowest-cost or most practical way of serving its customers --- who are the owners of the utility and elect its management. Curiously, these realities have not yet been mentioned in any of the public literature on the feasibility of Susitna, and it is not alluded to even indirectly in the Acres plan of study.

Study findings, incentives, and credibility.

The Plan of Study does not explicitly presume that the Susitna project is feasible, and its introduction explicitly rejects any such presumption. The substance and sequence of work tasks, however, strongly imply that Acres and possibly the Power Authority have already decided that Susitna is in fact the best generation alternative for the Railbelt, and that the project should go ahead.

Clearly, the \$13.5 million already spent on the study at the time the power alternatives report is issued will create substantial momentum for the contractor and subcontractors to complete their work in progress. Even more importantly, the \$16.1 million remaining to be spent if and only if the initial go/no-go decision is affirmative cannot help but be a powerful incentive for the study team to arrive at a favorable conclusion.

The current study plan's treatment of economic, financial, and institutional issues is consistently inadequate, and it does not provide the funding necessary for timely and professionally competent demand forecasts, cost and risk analyses, or studies of marketing and rate design, reliability and load management, or financial feasibility.

The Acres plan apparently does not even intend that its cost, risk, and scheduling analyses, or its study of marketing and financing, be used for decision-making in Alaska. The place of these studies in the project schedule, and the language of the Plan itself, state implicitly and explicitly that the main or only reason for including the studies is the fact that FERC requires them as part of a power facility license application.

This strategy, if endorsed by the Power Authority, the governor, and the legislature, means that Alaska is willing to postpone any realistic and credible analysis of Susitna's feasibility to the FERC licensing proceeding, and to delegate the real go/no-go decision on Susitna to FERC and other federal agencies.

As it approaches construction, the Susitna project will become more rather than less controversial. It will arouse

controversy within the state's utility industry, in the legislature, and among the public at large; before FERC, EPA, and other federal agencies involved in the licensing process, and possibly in the Congress; and it will be controversial at best in the financial community. If the project is indeed the best alternative for the Railbelt, an inadequate information-base or patently biased decision-making process at the state level will hinder rather than speed the federal review process, and it will not make ultimate approval any more likely. On the other hand, if the project is unsound, Alaskans ought to find out earlier rather than later, and in a study process that they control, rather than in adversary proceedings before federal regulatory bodies.

The established philosophy of Alaska's capital budgeting procedures is that planning, and particularly the projection of capital needs, can be objective and rational only if they are independent of the parties that have a material interest in construction. The legislation that established the Alaska Power Authority explicitly set out such a procedure, placing the responsibility for power facilities planning in the Department of Commerce and Economic Development, and requiring a thorough executive-branch review of any major power project the Power Authority proposes for legislative approval.

The current study plan and decision-making schedule for the Susitna project are quite inconsistent with this philosophy. The Division of Energy and Power Development in the Department of Commerce and Economic Development has apparently not yet attempted to assert the role the legislature contemplated for it, and the division's staff and funding

have in any case been inadequate for that role. As a result, forecasting and planning responsibilities have fallen by default to the one party the legislature intended should not bear them --- the Power Authority. And the Power Authority has, through the Acres contract, delegated these responsibilities to a consultant group that has a compelling material interest in approval of the Susitna project.

Under the present plan, the Governor is scheduled to make his recommendation to the legislature in late 1980 whether to concentrate the state's effort on Susitna or on some other alternative. There is now a serious danger that the information available at that time will not be (or appear to be) objective, credible, or even wholly relevant to informed decision-making on this issue.

Recommendations.

We therefore recommend four major changes in the Study Plan and decision schedule:

A. Decision date. The initial go/no-go decision should be delayed until about the end of 1981. There is virtually no possibility that sufficient information will be available for an informed decision before that time. This recommendation does not mean that study tasks currently scheduled by Acres for 1981 should be postponed until the later decision date, but only that neither Susitna nor any of its plausible alternatives should be rejected before that date.

B. Divorcement of forecasting and analysis from construction design and management. The combination of demand forecasts and analyses of power alternatives into a facilities investment strategy should be directed by, and responsible to, someone other than Acres or the Power Authority.

The location and administration of these studies for bookkeeping purposes is not at issue, nor is the need for the contractors to coordinate their assumptions and methodology with Acres and its subcontractors. In the absence of an established power planning capability anywhere else in state government, timely attention to the issues identified in this report probably demands a continuity of effort that can be achieved only within the framework of the existing Acres contract, but the Plan should be restructured so that the analysis of generation alternatives, and the input to that analysis, is more independent of the Power Authority and Acres, both in fact and in appearance.

One way of achieving this independence might be for the Power Authority to contract (or Acres to subcontract) management of an expanded "power studies" phase to a consultant firm that has no other role in the study, and for that firm to be responsible for its assumptions, methodology, and results to an interdepartmental task force in the executive branch or to a joint executive-legislative task force, rather than to Acres or the Power Authority.

C. Scope and funding of power studies. The "power studies" phase of the Susitna feasibility study needs to be expanded in scope and funding, at the same time as it is extended and made more independent of entities that have a material stake in the study outcome. The following recommendations for additional time and funding are little more than preliminary, intuitive estimates, but we offer them in order to indicate the shift in emphasis we believe is necessary to an adequate, objective study plan:

1. Total and peak loads, and load duration curves, must be derived in a single coordinated effort, and

must explicitly take into account the potential impact of peak-responsibility pricing and load management on the need for peak and reserve generating capacity. A credible effort would require at least \$250,000 and one year.

2. Preliminary cost, risk, and scheduling analyses for alternative Susitna scenarios should be available as inputs to the decision on generating strategy. These preliminary analyses would cost at least \$300,000, and require one year.
3. Cost, risk, and scheduling analyses for the most promising alternatives to Susitna identified at in the initial study phase should be as thorough and reliable as those for Susitna itself. At least \$150,000 and six months would be necessary.
4. The potential of natural gas liquids and fuel-grade methanol as turbine or boiler fuel should be added to the list of generation alternatives to be studied. Initial consideration of these alternatives (at least sufficient to determine whether or not to reject them summarily) would cost about \$30,000.
5. Preliminary marketing and financial analyses are necessary as inputs to the demand, cost, risk, and, scheduling studies, and to any practical decision regarding Susitna. The cost of these studies would probably be about \$75,000 over six months.
6. A multidisciplinary panel of contractor, subcontractor, agency and outside experts should examine and reexamine the major assumptions used in the demand, cost, risk, scheduling, marketing, and financing studies. The views of these experts should be translated into probability distributions and systematically incorporated into the assump-

tions by means of "Delphi" or comparable methods. This process would cost on the order of \$75,000, and run concurrently with the other studies mentioned here.

7. The program used to rank expansion strategies for Railbelt electrical generating capacity should take account of all of the information generated in the power studies, and should be operable within a "Monte Carlo" framework so that its results can be expressed in terms of probabilities. Operating a state-of-the-art power planning model with the information described here would cost at least \$100,000.
8. The results of the decision model should be "run backward" through the process that led to those results. That is, those strategies that the model identifies as having the greatest expected net benefit, or having the greatest benefit in the most likely scenario, should be analyzed under other plausible assumptions in order to compare (say) the consequences of not building Susitna if it turned out to be "needed", with the consequences of building the facility if its power turned out to be unmarketable. The costs of this process are incorporated in the previous figures, which total (at minimum) \$980,000.
9. Because circumstances and knowledge about the Susitna project and its alternatives will change substantially during the overall study period, all of the assumptions, methods, and results of the preliminary study phase should be reevaluated and updated before any construction actually takes place. This process is likely to cost about one-fourth the original studies, or \$250,000.

D. Fallback strategy. It is likely that the Alaska Power Authority, the governor, and the legislature will choose Susitna hydropower over other Railbelt generating alternatives at each decision point in the present study schedule. The project may nevertheless fail to obtain a federal license, sales contracts with Railbelt utilities, or financing on terms that are acceptable to Railbelt consumers or Alaska voters. Even with a license, sales contracts, and financing commitments, actual construction or operation may be delayed indefinitely by regulatory indecision or litigation. For this reason, the state and the utilities of the Railbelt should always keep alive one or more fallback strategies that involve smaller fixed investments and shorter lead-times. The study of alternatives, in other words, should never be totally given up.

ALASKA POWER AUTHORITY

333 WEST 4th AVENUE - SUITE 31 - ANCHORAGE, ALASKA 99501

Phone: (907) 277-7641
(907) 276-2715

May 2, 1980

Mr. Arlon R. Tussing
Arlon R. Tussing & Associates, Inc.
2720 Rainier Bank Tower
Seattle, Washington 98101

Dear Mr. Tussing:

We have had the opportunity to examine your review draft entitled "Susitna Hydropower: A Review of the Issues" and appreciate the opportunity to offer our comments before your preparation of the final version. In this response we initially summarize the purpose of the Susitna Plan of Study (POS) and discuss its intended philosophy. This is followed by a discussion of some specific issues raised in your Report.

The Susitna Plan of Study is a dynamic document which has been and will continue to be modified and expanded as the concerns and needs of various agencies and the general public become known. There are obviously a number of courses of action which the Power Authority and the utilities might take over the next decade to meet the future electric power needs of the Railbelt Region. As presently conceived, the Susitna POS embodies but one of these courses of action. The scope of work will:

- establish the criteria by which the technical, economic, financial and environmental feasibility of the Susitna Project should be measured;
- assess whether Susitna or some other alternative future Railbelt generation expansion plan satisfies such criteria; and finally,
- if such criteria are satisfied, pursue the FERC licensing of the Project.

In other words, the study will establish whether the Susitna development is appropriate and if so, how best to proceed with that development.

The POS has since its inception undergone a continuing process of evolution in satisfying the overall objectives. At the same time, provision has been made for tapping the input of those concerned through reviews, public meetings and the action list. As a result, the scope and direction of the Susitna study may be changed at any time or the study even terminated, should the evidence indicate that some other course of action should be pursued instead.

Your Report constitutes probably the most detailed assessment yet made of the POS, and is welcomed as a positive contribution to the development of an acceptable course of action. By and large, it is well prepared, thoughtful, and well written, but a significant flaw is its preoccupation with

Mr. Arlon R. Tussing
Page Two
May 2, 1980

making explicit judgements about the Project before all the evidence is in. Many of the comments may prove to be valid, but until studied, cannot be verified. More specific comments follow.

1. The Report seems to be based on a misunderstanding of the Go/No Go decision points. In the POS there are essentially three such decision points. During the proposed 30-month study period, each of these decision points relate to "continue-to-study" or "not-continue", rather than "build the project". We wholeheartedly agree with you that a project as large as Susitna requires extensive study and cost expenditures to fully determine whether it is the appropriate course of action. In our judgement and that of Acres, a 30-month period and at least a \$30 million expenditure is necessary for a license application decision to be made which adequately considers all issues involved. Nevertheless, it would clearly not be cost effective to defer an obvious No-Go decision until the end of the 30-month period. The Power Authority has not only fiscal responsibility, but also cannot delay its power generation expansion planning activities for that long. The first Go/No Go decision in early 1981 will consequently be made on the basis of an initial comparison of alternatives essentially based on available information and considerable well-informed judgement.

There is no question that, with the constraints imposed on data collection, load forecasting, alternative energy studies, etc., it will be difficult enough to make the decision whether or not to proceed with the study within one year; it would be entirely impractical and imprudent to make the much more profound decision regarding whether or not to build at that time, unless some overwhelming factor(s) intervene (either for or against).

2. Nowhere does the POS propose that "Woodward-Clyde will derive . . . load duration curves from ISER's projections". The first paragraph of Page 5-11 of the POS states that various recognized methodologies and their applicability will be studied for the problem at hand.
3. Contrary to the assertion that peak load pricing is not mentioned in the POS, Subtask 1.03 has load management activities as an integral part.
4. In response to your concern regarding the lack of some sort of probability assessment for ISER's scenarios, it should be noted that the ISER contract calls for an evaluation of " . . . the probability of each of the projections generated . . .".
5. Your Report presents a useful overview of the planned Susitna hydro-electric project in relation to likely future developments and economic trends in Alaska's Railbelt Region. In this regard, however, the Report seems biased towards a general scenario which sees preferential pricing of natural gas continuing into the next century and a resource-depletion-led slow-down in the mid 1990's. This bias strongly influences the arguments presented in relation to the marketability of Susitna power

Mr. Arlon R. Tussing
Page Three
May 2, 1980

and energy. Further, the Report seems to view Susitna hydroelectric development as a single project coming into operation all at once. In fact, the present proposal is for a two stage development phased to meet market area requirements, and we are pursuing studies to assess the possibility of more numerous smaller stages. While there is some support for the cautionary attitude regarding competitiveness of Beluga coal and other alternatives, the situation regarding these must certainly be taken at the time as "not proven". The level of relative competitiveness with Susitna hydroelectric power production will be only partially established one year from now when the decision is taken whether or not to proceed with the study (let alone the project).

The lack of support for Susitna development from the management of Chugach Electric is readily acknowledged, but Chugach can hardly be expected to commit itself to the Project in advance of completed feasibility studies. At the same time, it would be foolish to drop further consideration of Susitna because Chugach has not committed itself; to do so would be to accept a Catch-22 situation. Also overlooked in your assessment of marketability is the opportunity to provide power to industries which now produce their own power. Certain marketing arrangements are conceivable that would induce the purchase of Susitna power to the benefit of all Susitna power customers.

6. The content of Task 11 as proposed in the POS does not appear to be properly understood. You state with emphasis that "Susitna's viability will not be based on either its economic or financial feasibility". This is incorrect. Task 11 requires incisive studies and reports on:

- "Possible Economic Limits to Project"
- "Overrun Possibilities"
- "Security of Project Capital and Structure"
- "Evaluation of Alternative Markets of Susitna Output"
- "Evaluation of Alternative Options for Meeting Railbelt Power Needs"

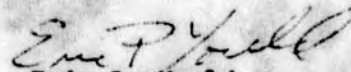
All of these are to be completed before the third Go/No Go decision point and before a decision is made on submitting the license application.

7. It is fully realized that one of the problems to be faced with a capital intensive development such as a hydropower plant is that the cost of service with the project in the system is likely to exceed the cost of service without the project in the system for the first several years (probably 8-10). Particular attention will be necessary to find ways and means of alleviating the burden on Alaskan consumers in this century of costs of service which will benefit the next generation. This is a very major issue which will require review of a number of options and it should not be readily assumed that past practices will prevail.

In two places in your report, the burden imposed on consumers by the Construction Financing burden (AFUDC) is referred to. It is suggested that the consumers will pay in advance for electricity they may not receive for 10 years or, in your words, "if ever". Capitalization of AFUDC is yet another issue that will be exhaustively studied and treated in the marketing and financing tasks. It is quite improper to assert at this stage that "non-recourse financing would require all-events contracts (compelling consumers to pay for Susitna whether or not they ever got Susitna Power and no matter how much it turned out to cost) prior to construction". The statement is correct if the words in parenthesis are omitted; but the inference with the words left in is, to say the least, provocative and misleading. You may claim that under Alaska PUC rules this has occurred in the past on other arrangements between wholesaler and utility delivering to consumers, but it is a gross assumption that it is necessarily to be the approach for Susitna.

In closing, I want to reiterate my sincere appreciation for your helpful review of our Susitna Plan of Study. While I believe there were a number of inaccuracies or misunderstandings in the review draft, there were also a number of very worthwhile suggestions. A revised plan of study has already been prepared and presented to the Legislature and to the Administration for their consideration. If approved and funded, I think it will be extremely responsive to your recommendations.

Sincerely,



Eric P. Yould
Executive Director

SCOMM

#44:23

HOUSE
JOURNAL SUPPLEMENT

April 20, 1979

Friday

No. 44

HCS
SB
63

April 19, 1979

TO: Rep. Terry Gardiner, Speaker
House of Representatives

FROM: Rep. Bill Miles, Co-chairman *BM*
House Resources Committee

COMMITTEE REPORT

HCS SB 63 - SUSITNA HYDROELECTRIC PROJECT

During several meetings and the teleconferenced hearing regarding the Susitna Hydroelectric Project, numerous issues were brought up. As many of the issues were technical in nature, the issues raised and findings herewith are submitted for consideration.

1. Energy demand for project is unrealistic

a. The project is to be developed in two stages: Watana on line in 1994 (3.1 billion kwh) and Devil Canyon on line in 1999 (3.0 billion kwh).

b. Battelle¹ indicates an energy demand range for the Susitna market area in the year 2000 of 8 billion kwh to 27 billion kwh annually.

c. The Department of Energy² indicates an energy demand range for the Susitna market area in the year 2000 of 8 billion to 20 billion kwh annually (pp. 4.28 - 4.29).

d. It has been suggested that if these load projections do not prove out that the railbelt will have an energy glut that will stimulate unwanted industrialization. This would be precluded by project staggering. In addition, Battelle³ indicates that cheap power alone will not attract industry (page 22).

2. Economic feasibility is questionable

a. Battelle¹ indicates a year 2000 Susitna energy cost of 26 cents per kwh while the costs for coal, diesel or natural gas generation would range from 64 cents per kwh to 82 cents per kwh.

HCS
SB
63

b. In present-day dollars, Department of Energy² estimates the cost of Susitna power in the year 2000 to be 10 cents per kwh while the most feasible alternative--coal--will cost 16.5 cents per kwh (page 107).

c. The Corps of Engineers³ studies, in which a number of sensitivity analysis were performed, indicate the project to be economically feasible.

3. Project threatens fisheries and wildlife

a. Salmon do not presently migrate above the proposed dam sites.

b. The Corps EIS acknowledges possible adverse environmental impact but also indicates the "possibility" of an enhancing affect on downstream fisheries.

c. The Phase I studies will provide for extensive analysis of project impacts on the environment. Until such studies are conducted, it is not possible to determine either negative or positive environmental impacts which might result from the project⁴.

4. All alternatives have not been analyzed

a. Alternative studies have been conducted by 1) the Bureau of Reclamation, 2) Corps of Engineers, 3) Department of Energy, 4) Battelle, 5) private industry, and 6) the Federal Energy Regulatory Commission. In each case, of all the alternatives reviewed, the Susitna project was found to be the best long range option, and in the event Susitna does not come to fruition, coal-fired steam generation is the next best alternative.

b. Coal-fired plants, however, cost in excess of 10 times the cost of comparable generation capacity.⁶

c. The Fuel Use Act of 1978 and other National Energy legislation regularly reduce the number of alternatives available for use.

5. Corps shouldn't study then build the project

a. If the Corps of Engineers' is used for the study, the option remains to use a private firm for construction.

b. The House Resources Committee substitute provides a choice between the Corps of Engineers and a private Engineering firm for the Susitna studies.

c. In that construction financing would likely come from the revenue bond market, prudent conservative investment practices would preclude commitments based on biased analysis.

HCS
SB
636. Why not delay funding?

- a. The cost of the studies will increase with inflation.
- b. The ultimate cost of the project will increase with inflation and this would be passed along to consumers.
- c. Local utilities especially in Anchorage and Fairbanks, are looking for early commitments to major sources of power in lieu of less cost-efficient smaller sources.
- d. Approval of contingent funding now would allow necessary winter work to be done later this year and early in 1980. The first year's summer work would follow. Delay would postpone necessary winter work until late 1980... thereby losing not only this summer season but next summer as well.

7. Seismic risk

- a. Analysis to date has been based on a design that could protect against an 8.5 magnitude earthquake occurring 40 miles from the project.
- b. Corps studies will provide for extensive seismic analysis during Phase I studies.
- c. If a private engineering firm conducts the Phase I studies, extensive seismic analysis will be conducted by that firm too. In addition, a private, independent study will be conducted.

FOOTNOTES

- 1/ Alaska Electric Power - An Analysis of Future Requirements and Supply Alternatives for the Railbelt Region, Battelle Pacific N.W. Laboratories, March 1978.
- 2/ Upper Susitna River Project Power Market Analysis, United States Department of Energy, Alaska Power Administration, March 1979.
- 3/ Southcentral Railbelt Area, Alaska, Upper Susitna River Basin Supplemental Feasibility Report, U.S. Army Corps of Engineers, 1979.
- 4/ Susitna Hydropower Plan of Study, U.S. Army Corps of Engineers, June 1978.
- 5/ Energy Intensive Industry for Alaska, Battelle Pacific Northwest Laboratories, Sept. 1978.
- 6/ Electrical Energy Requirements for the Greater Anchorage Area Through the Year 2000, Municipality of Anchorage, Municipal Light and Power, Feb. 1979.

MEMORANDUM

October 21, 1979

TO: Representative Brian Rogers and Representative Hugh Malone,
Co-Chairmen of the House Power Alternatives Project Committee
FROM: Mark Wittow M
RE: Activities of the Committee, Status of Power Alternatives Study

A. Alaska Power Authority's Selection of a private firm to carry out the Susitna Phase I Plan of Study

The committee analyzed the three voluminous proposals submitted to the Authority by Acres American, International Engineering and Harza. Larry Katkin, a geotechnical consultant, was retained by the committee to review the quality of the geotechnical aspects of the proposals. The committee focused on the sections of the study dealing with power market demand projections, power alternatives, environmental impacts and public participation.

Rep. Rogers presented detailed testimony to the board of the Authority. The testimony strongly supported the choice of Acres American for several reasons:

1. Acres possessed the greatest experience with sub-Arctic construction and planned to retain the most experienced firm in Alaska for geotechnical work.
2. Acres planned to spend a greater portion of the budget in-state than any of the firms.
3. The Acres proposal contained the most objective and detailed studies of power market demand and power alternatives.
4. The Acres proposal provided for the most extensive and direct public participation process.
5. The Acres proposal provided for the most expert, objective check on the quality of seismic work.

Concurring with the committee analysis and other testimony, the Board chose Acres to be the firm to carry out the Plan of Study if the Board chooses to have a private firm, and not the Army Corps of Engineers, build the project. The decision on whether to use the Corps or a private firm will be made at the end of this month. (Committee testimony supported the use of a private firm, due to the greater degree of flexibility and control that the state would have.)

B. Basic Study Design

The legislation authorizing the Power Alternatives Study mandated the completion of a \$200,000 study discussing the assumptions of the Susitna project and the feasibility of alternatives including coal, natural gas and small hydro.

Representative Rogers
Page Two

A complete analysis of the alternatives has been put off until next year, when the Power Authority will have to review all of the available alternatives in detail as part of the Phase I FERC licensing procedure. The committee will attempt a detailed analysis of the power alternatives section of the Susitna Plan of Study at that point. The Committee's efforts to date have focused on the areas where the most serious gaps exist, and the areas where work could most constructively be accomplished before the April 15, 1980 deadline for the report.

Part of the explanation for reworking the structure of the study lies with the demise of the Legislative Research Division. The \$200,000 study was originally to be managed by the Division, along with a concurrent appropriation of \$150,000 for a study of the in-state use of natural gas. The funding for the Susitna study was not freed up until the August Legislative Council meeting, when you and Representative Malone were appointed to be committee to manage the study. The additional \$150,000 appropriation for gas use is still in limbo. Since August, you and I have talked with a variety of interested parties to see what could best be accomplished before April 1980.

The Alaska Power Authority has been receptive to the concerns of the Committee, and we have decided to cooperate with them as much as possible in order to prevent duplication of effort while providing criticisms of their work at the most useful times. The key areas of concern before April will include work in the areas of power market demand projections, conservation, renewable energy sources and natural gas, as well as a broader look at the basic financing and management issues involved in providing power to the Railbelt area.

The Committee will present a report to the legislature on April 15, 1980, as specified in the legislation. However, some of the sections will still be in draft form then. A final report should be presented sometime in May, although additional work will be necessary after that date if the Power Alternatives Study is to continue checking the work of the Power Authority.

C. Specific Study Contracts

1. Power Market Demand Projections -- by the University of Alaska Institute for Social and Economic Research.

The section of the study is being done in cooperation with the Power Authority. They have shared in the design of the contract,

Representative Rogers
Page Three

and will participate in the funding. This portion of the study will also serve as the power market demand projection for the Susitna Phase I Plan of Study.

The particulars of the scope of work include methodological review, data collection and updating, economic projections, assessment of interfuel substitution possibilities, electricity use projections, and an assessment of the probabilities of the various scenarios and projections. The Institute will hold a workshop in December to review the assumptions behind the economic projections, and will cooperate with a variety of other Committee consultants.

2. Review of the ISER Demand work

Brad Tuck, an economist with the University of Alaska School of Business, and Energy Probe, of Toronto, will separately analyze and criticize past demand projections as well as the work ISER is undertaking for the committee.

3. Potential of Conservation and Renewable Energy

The Alaska Center for Policy Studies will manage the various portions of this section of the study. The work will include an analysis of the end uses of energy in the Railbelt area, a determination of the potential for energy conservation and the use of renewable energy sources, a discussion of the social, economic and political measures necessary to achieve the conservation and renewable energy potential, and work on conservation legislation for the 1980 session (HB 364). A variety of subcontractors will carry out the specific tasks.

4. Natural Gas

This portion of the study will address institutional limitations on the future use of natural gas for power generation, the future price and availability of gas, the efficiency of gas-fired generation facilities, and the potential for the use of natural gas in direct consumer applications. A proposal by economist Greg Erickson is pending.

5. Overview

This section would address the historical background of the supply of electric power in the railbelt, survey the basic policy questions at stake in the Susitna decision, delineate financing questions and address the decision-making structure for Susitna and other power alternatives. A proposal by economist Arlon Tussig is pending.

6. Soci-cultural impacts

This section would investigate the effect of the construction of the Susitna dam on both the local area and Alaska, and relate those effects to both a historical and anormative context. A proposal by the Arctic Environmental and Data Center of the University of Alaska is pending.

7. Other sections of the study

Additional work is contemplated in the areas of coal-fired generation. A review of the adequacy of Phase I study of environmental impacts is also contemplated.

C. Coordination, Misc.

The committee contacted a variety of consultants both inside and outside the state about possible participation in the study. The consultants with the greatest abilities to address questions in an Alaskan context were selected. Constraints of funding, time and experience prevented the Committee from contacting all possible participants.

The committee is coordinating the study with other legislative committee and administrative agencies who are doing related work.

These other contacts include:

- Small Hydro (Renewable Energy) Committee
- Rural Energy Interim Committee
- House Resources Committee
- House Finance Committee
- Alaska Power Authority
- Division of Energy and Power Development
- Division of Policy Development and Planning
- Department of Environmental Conservation
- Department of Fish and Game

The committee has also kept various public groups apprised of our work.

to Vic

MEMORANDUM

October 9, 1979

To: Representative Brian Rogers
From: Mark Wittow
Re: Progress on Susitna Alternatives Study

1. Organization of the Study

The Committee has developed a rough outline for the plan of study, which works in cooperation with the Alaska Power Authority's proposed Plan of Study for the Susitna Dam. The outline calls for a detailed power market demand study, an analysis of conservation and renewable energy sources, coverage of various geotechnical and engineering questions, and a review of the potential of power from coal, natural gas and small hydro sites. In addition, the Committee will develop "criteria for evaluation" of power alternatives for use by the Power Authority.

2. The Power Market Demand Study

A draft Scope of work has been negotiated with the Institute for Social and Economic Research, in conjunction with the Power Authority.

3. Conservation and Renewable Energy Sources

A draft scope of work has been received from the Alaska Center for Policy Studies. Proposals for various parts of the study have been received from the Fairbanks Federation for Community Self-Reliance, and Richard Seifert, and Energy Probe, MERDI and other consultants.

4. Criteria for Evaluation

A draft proposal has been received From Masoni Assoc., and several other economists have been contacted about possible participation. Arlon Tussig will be submitting a proposal to do an overview of important issues.

5. Supply

except Greg Erickson

No specific contacts have been made on the coal, gas or small hydro questions. The committee will seek the advice of Rep. Miles, who chairs the pertinent legislative committees.

6. Engineering, Technical and Environmental Questions

The Committee contracted with Larry Katkin for a geotechnical review of the APA Proposed Plans of Study. Other architects and engineers have been contacted about participation in the study. The Arctic Environmental Information and Data Center will be submitting a proposal for a review of downstream effect questions.

7. Coordination with State Agencies

The Committee has been working closely with the Alaska Power

Authority, [↓] the Division of Energy and Power Development in designing the study. The committee has also worked with the Council on Science and Technology, DPDP and the appropriate legislative committees-- House Resources, Rural Energy and Small Hydro.

8. APA Hearings to select a Private Firm for the Plan of Study

The Committee attended these hearings, analyzed the voluminous study proposals, and offered detailed testimony on the proposals. The committee strongly endorsed Acres American, the firm that was finally selected.

9. Community Contacts

The Committee has talked with several members of environmental and public interest groups who have been involved in the Susitna issue, as well as other private citizens.

10. The future

(me, hopefully)
Hire a coordinator, finalize contracts.

Brian Rogers testimony to HOPA 9/27

A

- ① Procedure Kudos - more for it
- 1a) Private vs. Corps - local hire, + no need to guarantee
- ② Studies Responsibility of APA (Unlert)
- ③ Legislation Interest - low cost, adequate power
economic & environmental impact,
safety
[part of a larger energy policy / local jobs
+ financing - legislative role]

④

Integrating of Planning Process -

conflicts between planner, developer, builder
power market studies should be separated or duplicated
or 2/3 stringent oversight

study in
3 discrete
segments

- 4a) Conservation, falling demand in Eb.
- ⑤ Demand projection - ISEK + critiques
suggestion of joint effort

⑥ Alternative + conservation contract work pool

⑦ Geotechnical - northern experience (no Texas experience)

⑧ Transmission lines - risk of failure - answered by
you'd

B - Comment on 3 firms - Acres led - northern experience
reducing line

C - Legislative Study - demand
conservation + renewable energy research
oversight

OMB gives go-ahead to Susitna studies

By LAURIE MCGINLEY
News-Miner Bureau

WASHINGTON—For more than a year Sen. Mike Gravel, D-Alaska, tried unsuccessfully to persuade the federal Office of Management and the Budget to give the go-ahead for final design studies on the Susitna hydroelectric project.

Then, a few months ago, Gravel found a lever: The administration wanted to win congressional approval for a proposal that would require state governments to pay the bill for five to 10 per cent of federal water projects. The cost-sharing bill was referred to the

Water Resources subcommittee Gravel chairs.

Holding the cost-sharing bill hostage, Gravel demanded action on Susitna. He refused to schedule hearings on the administration's proposal until the Susitna dam issue was settled.

Today, the day after Gravel conducted the first public hearing on the cost-sharing proposal, OMB announced its approval for final Susitna dam studies.

"It was all a matter of seniority," said Gravel. "It was easy enough for me to withhold my support until they did something about Susitna. There are

so many problems within your field of vision. You naturally have to pick and choose between them."

OMB's decision, according to Gravel, means the \$2 billion Sustina project won't encounter any more opposition from the Carter administration.

"If they lose their enthusiasm for Susitna, it will be just as easy for me to lose my enthusiasm about cost-sharing," he said. "But I don't expect that. We made commitments, and I expect everyone to honor them."

With OMB's approval, the hydroelectric project now can enter the so-called Phase I stage, which includes final pre-construction engineering

design, a cost-benefit analysis and an environmental impact statement.

Phase I is expected to take 46 months and cost \$25 million. More than \$5 million in federal money already has been appropriated for the project and is now in the Alaska Hydroelectric Development Fund.

Gravel said the money would enable the studies to begin. He plans to request an additional \$20 million from the Senate Appropriations Committee later this year.

It is still undecided how the federal funds will be used in the two-dam project to be located on the Susitna River between Anchorage and Fair-

banks.

"The money either will be used to finance Phase I directly or to guarantee the state's spending for Phase I activities," a Gravel aide said. "We want to find out what path will produce the quickest results."

Under the 1976 Hydroelectric Power Development Act, the enabling legislation for the project, the Army Corps of Engineers would build the dams as a contractor for the state.

The state government would pay for the construction and would own the dams and the power they produce, unlike water projects built by the corps and owned by the federal government.

Under the legislation, the federal

government would guarantee the corps' work and would reimburse the state for costs if Phase I produced a no-go decision.

Preliminary project plans call for a 635-foot concrete dam at Devil Canyon and an 810-foot earthfill dam at the Watana site, 31 miles upstream.

The Watana dam would be built first, with a generating capacity of 792 megawatts. Devil Canyon would generate 775 megawatts.

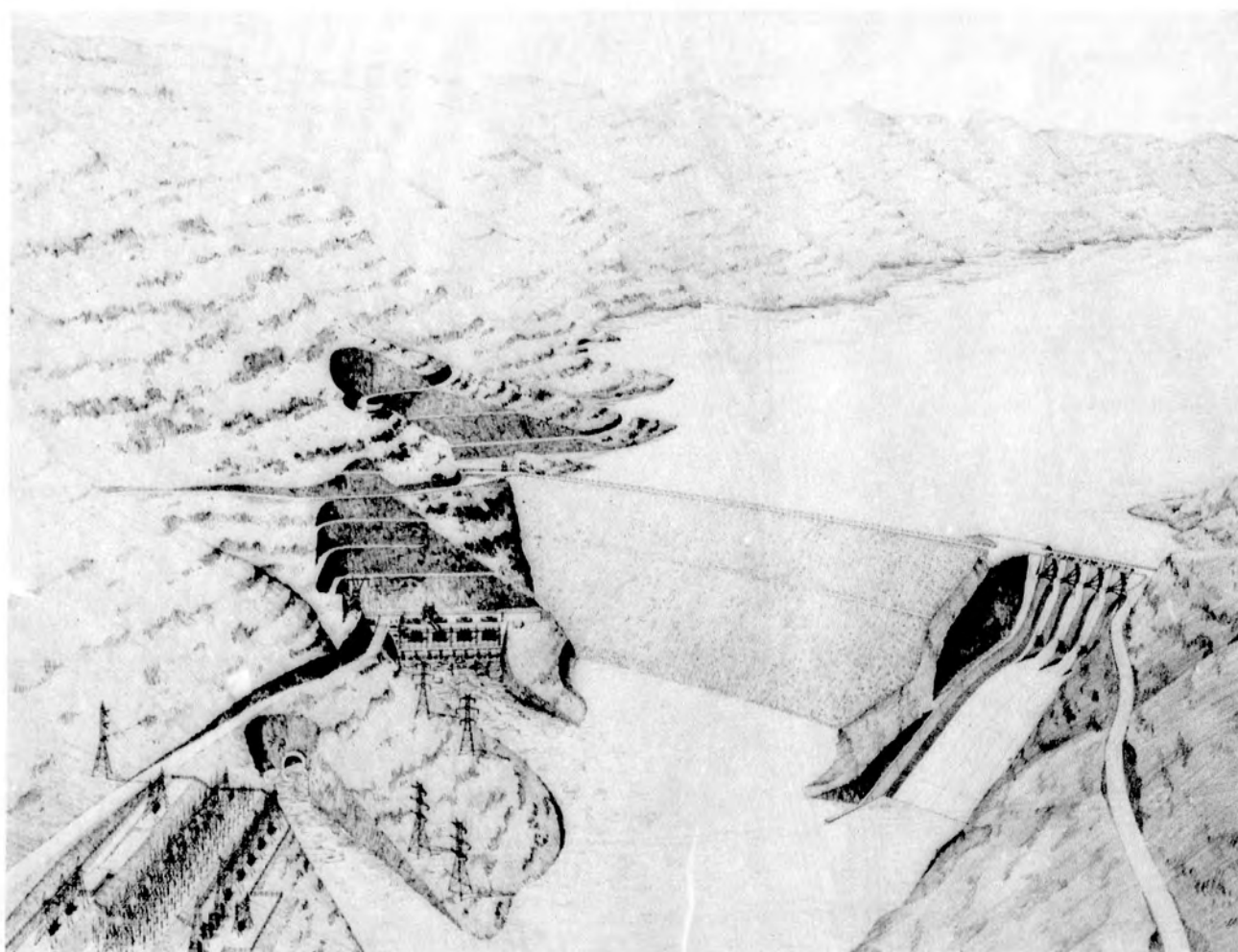
When completed in the early 1990s, the dams are expected to meet about 60 per cent of the electrical demand of the railbelt area, including Fairbanks, Anchorage and Seward.

THE ALASKA POWER AUTHORITY

Susitna Hydroelectric Project Plan of Study

Presentation by International Engineering Company

September 1979



INTERNATIONAL ENGINEERING COMPANY, INC.
A MORRISON-KNUDSEN COMPANY

Susitna Study Project Team

Project Executive



R. B. Christensen - Vice President

Mr. Christensen, Vice President and Regional Manager/North America, will be responsible for administrative and financial control. He will also maintain close liaison with the management of the Alaska Power Authority. Mr. Christensen has over 25 years of engineering experience and has been the Project Executive for all North American IECO projects since 1974.

Environmental Studies Principal-in-Charge



David H. Blau - Principal - EDAW Inc.

Mr. Blau is an experienced environmental planner and landscape architect with over 15 years of experience, principally in energy related projects. As Principal-in-Charge of Environmental Studies, he will provide direction and guidance to the Environmental Study Group to assure that environmental studies will be carried out in an efficient and orderly manner. Previous projects under his direction include the Environmental Report, Recreation Plan, and Fish and Wildlife Report for the 320-MW Stanislaus River Hydro Project, and the Environmental Report for the Pine Flat Hydro Project in California.

Exhibit "W" Environmental Report Coordinator



John W. Everingham - Associate - EDAW Inc.

Mr. Everingham, a system ecologist who has specialized in urban and rural environmental analyses, will be responsible for the project management and coordination of all aspects of Exhibit W-related studies including work program, work product, scheduling, production, and quality control. As Project Manager with EDAW, he is currently directing the preparation of Environmental Reports for three potential hydro projects in Idaho, as well as a Fish and Wildlife Resource Study for the Wiley Hydro Project on the Snake River.

Fish and Wildlife Resources Principal-in-Charge

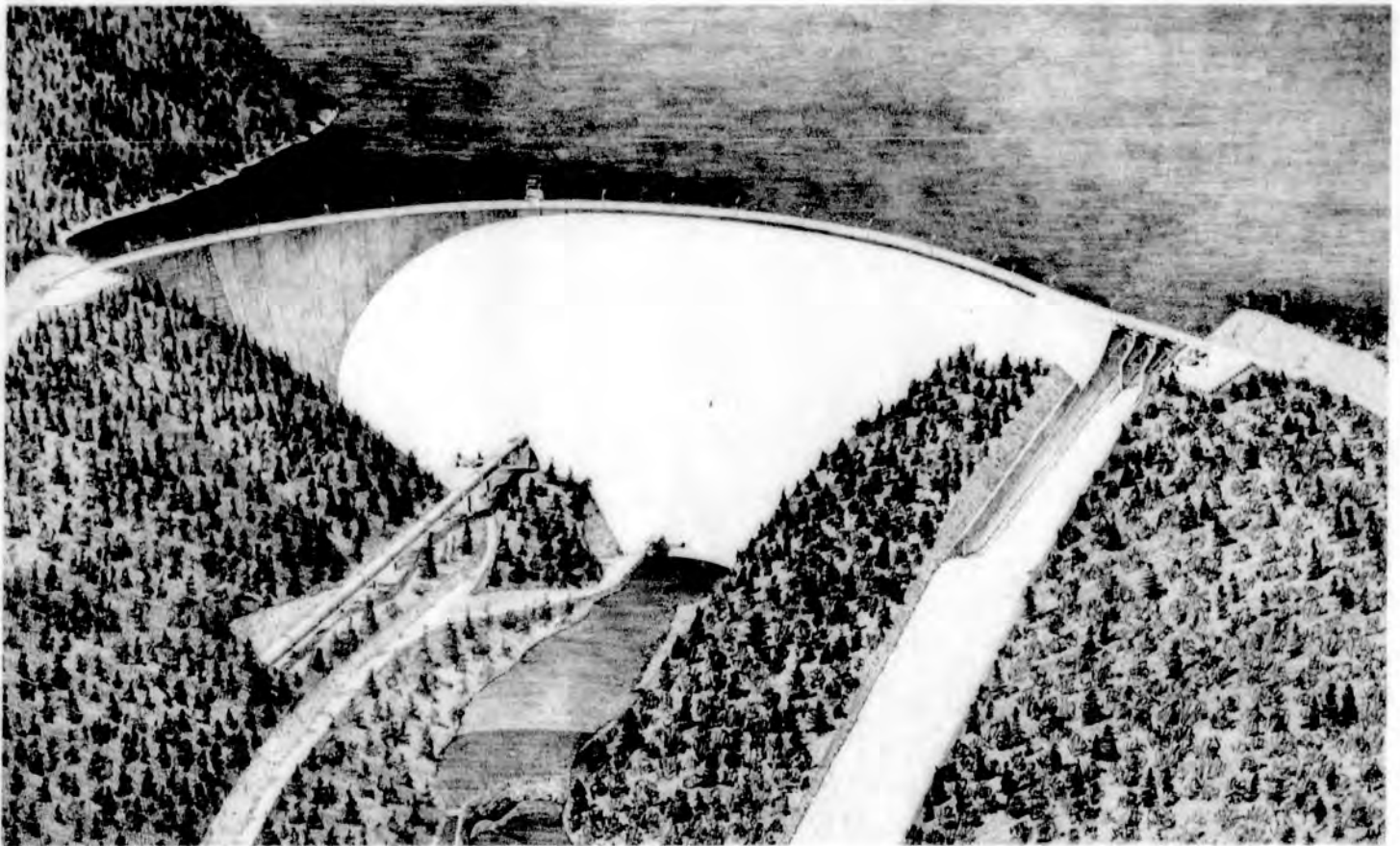


James E. Hemming - Principal-in-Charge, Biological Services

Mr. Hemming, Principal-in-Charge of biological services in Alaska for Dames & Moore, will be responsible for the project management and coordination of all aspects of the biological studies for Exhibits W and S including input, scheduling, production, and quality control. He has over 17 years of experience in fish and wildlife evaluations. Having worked in Alaska since the early 1960's, he is a recognized expert on Alaskan Wildlife.

A World of Experience

Pioneering in the development of new engineering concepts and designs for dams and related projects is a tradition with INTERNATIONAL ENGINEERING COMPANY, INC. (IECO)... a tradition built on over 30 years of experience in more than 50 countries around the world. Our services for hydroelectric projects include everything from initial studies for site selection and feasibility, through preparing specifications for equipment procurement and final construction drawings, to construction management.



With an inventory of 23 multi-purpose water projects, 50 major dams, 170 km of tunnels, 43 hydroelectric powerhouses, 3000 km of transmission lines and 3 major pumping plants, we at IECO have a world of experience in the investigation and design of major dam and dam-related projects to offer.



INTERNATIONAL ENGINEERING COMPANY, INC.
A MORRISON-KNUDSEN COMPANY

HEADQUARTERS OFFICE
180 HOWARD ST. SAN FRANCISCO, CA 94105
TELEX (ITT) 470040 - (RCA) 278362 - (WUD) 34-376
CABLE INTERENGCO TELEPHONE (415) 442-7300

Management Project Manager



Eric B. Kollgaard - Principal Engineer

Mr. Kollgaard, Principal Engineer and Chief of the Dam Design Department, will serve as the Project Manager. He will be in full charge of all technical services provided under the terms of the contract. This will include continuous liaison with representatives of the Alaska Power Authority and coordination of the activities of the various study and design groups involved in the Susitna Project. With over 24 years of water resources experience, Mr. Kollgaard has recently served as Project Manager for the Copper Creek Hydroelectric Project, the raising of Ross Dam, and the Windy Gap Water Supply Project.

Deputy Project Manager



Robert W. Retherford - Vice President - Arctic District

Mr. Retherford, Arctic District Vice President and Manager, will serve as Deputy Project Manager. He will be in charge of the Public Participation Program, in addition to his duties as the project management representative in Alaska. Mr. Retherford, who has received numerous awards in recognition of his valuable contribution to advancing engineering in Alaska, has over 25 years of experience in the power industry including design, construction, operations, economics and rate analysis.

Plan Synthesis Chief Planning Engineer



A. Ragnar Engebretsen - Principal Engineer

Mr. Engebretsen, Principal Engineer with over 30 years of experience, will be in direct charge of the Plan Formulation Studies, and the Definitive Project Studies. He serves as Chief Planning Engineer in the Water and Power Resources Planning Department and has been involved in Master Planning Studies in Peru and Bangladesh, water resources feasibility studies in the western United States, and the planning and design of hydro projects in the U.S., Australia, Taiwan, Iceland and Norway.

Preliminary Design Design Coordinator



Ram P. Sharma - Principal Engineer

Mr. Sharma, Principal Engineer will serve as Design Coordinator. He will be in charge of design input to the Plan Formulation Studies and preliminary design of project features for inclusion in the Definitive Project Studies report. Mr. Sharma has over 27 years of experience in the field of water and land resources development with particular emphasis on the design and analysis of dams, spillways, power intake structures and other major structures associated with water resources projects.

Technical Review Board Chairman



Archie A. Stone - Executive Vice President, Engineering

Mr. Stone, Executive Vice President, will serve as Chairman of the Technical Review Board. He will be responsible for monitoring the technical development of the project and advising the Project Manager in major decisions. His 30 years of experience in water resource development includes 16 hydroelectric projects for which he served as Design Engineer and Project Manager. Mr. Stone has served in a similar capacity on various other projects including the 12,600-MW Itaipu in Brazil.

Hydrological Studies Principal-in-Charge



Cyril J. Chan - Chief Hydrologist

Mr. Chan, Chief Hydrologist, has conducted hydrological studies for such major projects as the 12,600-MW Itaipu Hydro Project, the 2,100-MW Itumbiara Hydro Project, and the Nicaragua Master Plan. As Principal-in-Charge he is responsible for evaluating and defining the scope of hydrologic studies required for the project; directing and coordinating the activities of the Task Group Leaders in the study group; and establishing criteria guidelines, and overall technical supervision of all hydrological studies.

Geotechnical Studies Principal-in-Charge



Joseph S. Long - Chief Geologist

Mr. Long, Chief Geologist with over 20 years of experience in engineering geology, will serve as Principal-in-Charge of Geotechnical Studies. He will direct and review the studies undertaken by the Geotechnical Studies Group to ensure efficient execution and high quality performance of the work. Typical recent hydroelectric projects include the 12,600-MW Itaipu Project, the 2,800-MW Sao Simao Project, and the underground powerhouse and arch dam foundations at the Paute Hydro Project in Ecuador.

Anchorage Support Operations Principal-in-Charge



Ray S. Samuelson - Deputy Manager and Administrator, Anchorage

Mr. Samuelson, Deputy Manager and Administrator of the Anchorage office, will be responsible for overall coordination of support operations to ensure that the activities are scheduled properly and executed in a timely manner. Support operations under his direction will include: office support; field camps and logistics; permit applications; real estate; surveys and mapping; and other field activities.



**International Engineering Company's Project Team for the
Susitna Hydroelectric Project Plan of Study is composed of**

- IECO, established in 1945, a consulting engineering company specializing in water resources work throughout the world

in association with

- EDAW, Inc. and Dames and Moore, consultants in the environmental sciences, with wide experience on studies for hydroelectric projects and special expertise in the Alaskan region
- Hydrocomp, Inc. specialists in computer based hydrologic analysis

and supported in areas of their particular expertise by

- Cook Inlet Region, Inc./Holmes and Narver Inc.
- University of Alaska's Geophysical Institute, Museum and Institute of Social and Economic Research
- Shannon & Wilson

STATE
of ALASKA

MEMORANDUM

TO: George Matz, Budget Analyst
Division of Budget and Management
Office of the Governor

DATE: October 31, 1979

FILE NO:

TELEPHONE NO:

FROM: Eric P. Yould
Executive Director
Alaska Power Authority

SUBJECT: Capital Budget Revision

000114

Attached please find revised sections of the Power Authority Capital Budget. A drilling program of the Moonlight Springs aquifer resulted in a determination that the hydroelectric potential does not exist and the project is not feasible. Therefore, Moonlight Springs is removed from the Budget Request.

Information was recently received from the Alaska Village Electric Cooperative and the Alaska Power Administration of potential hydroelectric developments which appear feasible for 9 of 42 AVEC villages surveyed. Funds are requested to perform feasibility assessments of the potential hydroelectric sites for all 9 villages.

In addition, a capital program request for Discretionary Study Funds is submitted to permit flexibility and responsiveness within the authority to initiate reconnaissance studies and feasibility assessments of small alternative energy projects when a critical need is identified.

Attachments:
as noted

APA 10/28

APA will review seismic - nationally recognized

~~APCO~~

Decision on Corps vs Private - early Nov

IECO

66% of spending to Alaska

- 1 Determine Needs
- 2 Develop best plan
- 3 If Susitna, detail study $\Rightarrow$ FERC

Approach

- 1 Unbiased
- 2 Staged

Citizen Advisory Panel

CIRI - locations

S. Watan Camp operation

Synthesis: Future energy requirements

ISER

No new work on alternate sites

Alt energy sources $\Rightarrow$ hydro, coal, gas, geotherm, wind, solar, etc.

GOOD
IDEA

$\Rightarrow$ Optimum w/ w/o Susitna

Recommend plan

Energy alternatives $\rightarrow$ resource, socioeconomics. Downstream effects

Transmission routing (visual) Field work / Climate / F&W / Vegetation / Archaeology

Kollgaard Q: what is cost of 1st stage
Q: If at end of 1st stage, Susitna is not most feasible, then what is your role?

Petherford Q: Experience in public info + participation?

TAKE AVG. - MAX/MIN

How will you establish economic energy consumption?

Engbretsen Q: Optimum plan w/ w/o $\Rightarrow$ different demand assumption.

Bligh Q: will your downstream impacts include effects on

Houghton Q: The Susitna tidal flats. How? flow rates + turbidity (use AEIDC modeling also?)

Long Q: Other than Geophysics / Shannon + Wilson Lab testing, any AK contractors? What permafrost experience does your company have? Will you construct thermal model? Drilling program?

1. CONFLICTS OF INTEREST

- A. Planner eligible to build dam
- B. Feasibility study team is planner
- C. Power plan ~~for~~ contracted to dam builders

2. GEOTECHNICAL

- A. Thermal model of dam area (pond, thaw bulb)
- B. Geologic map of dam area
- C. Details of drilling program

3. ENVIRONMENTAL

IECO 4.1
ACRES 4.9 HARZA 4.8

- A. Downstream effects

4.

4. ALTERNATIVE ENERGY

- A. Conflict of interest on demand studies
- B. Non thermal-fired plants tidal, solar, wind
- C. Potential for energy conservation

5) Building dam in increments,

- effect a power supply of tunnel concept.

6) Timing of ^{power} market studies - Acres vs. Harza
+ dam feasibility

DICK

HARZA

Identify project suitable to Ak power market

Mrs Dwight Garside Engr Dick Mahan Ph.D. Don Nichol
Mkt Econ Fin George Valland Engr Jim Thrall ^{Pres} Mrs Herb Scholt

- Alt Sources - adequately explored?
- Project right size for Alaska
- Seismicity - suggest APA do independent
- Fish & Wildlife -
- Cost estimates - encourage independent review; also more background
- Socioeconomic - look at smaller projects
- Financing - project be sized for market so financeable
- Licensing - Small project first while designing larger

Ak - surv map drill lab test

⇒ Sr Technical Staff - how much involvement?

- Technical feasibility
- Environmental assessment
- Public participation
- Economics & Financing
- FERC license
- Consider ^{more} moderate-sized

3 Phase ① Brain planning (9 mos) - is Sust. the best source, define project ② Feasibility (15 mos)
③ FERC (3 mos)

Geotech - subcontract AK firms -
60% effort; 70% effort in AK
Cold Regions Engineering Aspects
(disturb types of permafrost)

GODD

Transmission system

- Criteria for performance + reliability
w/ participation of operating utility
load flow studies, routes, etc

HARZA

Good Old Regions Engineering:
Ice cover
Permafrost

Mkt/Economy/Financing Exhibit 4 - Power + Energy Utilization
Power Market
Alt Sources of Generation
Power System Expansion
Economic Analysis
Financial Analysis
historical Residual
Conventional thermal
other hydro small-scale
Indust Natl Def

Most probable alternative is thermal
① Sustana plus thermal ② thermal only
Using Naveen (Gallagher)

Good → Open access to information

○ Harza-water resources. Don't design thermal or nuclear projects

Q: Your company is a hydroelectric engineering company. Will this ~~present~~ result in a conflict as you assess alternative sources, including thermal, solar-associated or energy conservation?

HARZA

#2 Q ^{Mr. Harman stated} your company is a hydro ^{engineering} company. What precautions ~~with~~ ^{have} you taken to ensure the assessment of alternatives — thermal, solar/wind/tidal/geothermal, and energy conservation — will not be biased towards hydroelectric?

#1 Q ^{Mr. Walling} ~~Mr. Harman~~ said you would look at optimum energy development of ① Susitna plus thermal and ② thermal only. Will this be undertaken using varying demand and energy conservation scenarios?

will handle non-thermal alternatives themselves. Experience is that non-thermal are not competitive. Energy conservation/load mgmt have info. Small hydro would be used to replace existing thermal.
what we are doing is evaluating Susitna.

ACRES AMERICAN

John Lawrence - proj mgr

Team: R&M / TES / WCC / CIRI-H&N / SALOMON / FMA
Terrest Envr Wood Clyd Frank Molin

good idea External Review Panels + Environmental Review Panel
extensive northern experience — 5000 MW Churchill Falls/Labrador . 13500 MW North of 49°N //
9100 MW permafrost 7350 MW Underground
— DNR, ADF+G down // to APA in hierarchy
Power studies — Woodward Clyde (AK)
Project Mgmt — Frank Molin Assoc
DNR — in-stream flow studies
Chuck Debelius — formerly from Corps
Objectives: ① Tech, Econ, Envr Feasibility
② Envr ③ License
Power alt: Acres in major hydro alt (Dickey-Lincoln)
+ Woodward Clyde.
Field exploration — AK experience on location
1/yr — proceed or not
\$/m — go/no go w/o geotech, ~~etc~~ envr
Demand projections — Load Forecasts (WCC/ISER),
hydro, non hydro alts
Risk analysis
\$/million for seismic oversight
New FERC regs

ACRES

Power Studies

Forecast / Growth / Alternatives / Sep
will consider - hydro coal geo, solar, wind,
gas-fired turbines

Will use ERTS + low-angle sun

Tunnel Schemes - (w/Watana)

less environmental. Tunnel mt/s
used for Watana. Same cost as Denali

Recognized furbeavers in env. studies

Transmission lines Churchill 4500 Mw line

Good status reporting / public partic

Acres - consulting engs (1100 people)

Lots of North American projects (Canadian)

hydro / power + energy / industrial

Responsible (Churchill) - power contracts +

grading

Salomon - #1 in revenue bond / power projects public.

Briha Kessal Funk Ath / Socioeconomic ADF+G Mammals / Fish

WCC involved in Beluga Coal Studies

for Kenai Boro

(Nuke, Solar, Geot, Coal)

Since if private, state financing (or thru state)
Q: Methodology of alternatives study. ~~How will~~
~~you decide the least-cost method over~~
~~time to provide power?~~ What experience
does ~~WMA~~ Woodward Clyde have in decentralized
alternative energy sources? How will you
determine the potential effects of
energy conservation methods?

Q: Do you foresee problems in obtaining needed
quantities of earth materials if not
tunnel plans? ~~Will your geotechnical~~

Range of load forecasts for dif/ scenarios
Consider all alternatives

No experience in FERC large-
scale licensing

Wataha is the major site

Start financing (5 1/2 - \$6.11/m) planning early
follow load growth, customers, risks of
marketing, defaults, outages, etc.

Confident we can obtain financing
70% in State of AK

Use (gent elect) model

Consider Railhead @ Gold Creek - only access

House Approves \$8 Million For Susitna Feasibility Study

JUNEAU (AP) — The House Resources Committee has approved an \$8 million conditional appropriation for Susitna dam feasibility studies.

The measure now goes to the House Finance Committee.

The bill, as amended by the resources panel, would appropriate \$8,178,000 to the governor's office for the first of the four-year studies for the two massive dams on the upper Susitna River. But the money couldn't be spent unless Sen. Mike Gravel was successful in getting federal repayment should the dams not be built after an Army Corps of Engineers study, or unless a "reasonable alternative program" was created for a private firm to do the studies.

Should the bill clear the full House, it would go back to the Senate for approval or rejection of House changes.

The draft bill initially before the resources panel would have appropriated the funds to the Alaska Power Authority. But the committee changed the measure to give the money to the governor.

Rep. Bill Miles, D-Anchorage and co-chairman of the committee, also sent a number of committee findings along with the bill, including information on questions raised about whether the dams' power output would be needed.

The bill (SB63) also would appropriate \$150,000 to help line up a private firm to possibly start the studies.

It took little time for the committee to approve the bill Wednesday. Most of the debate on the issue took place in a long Tuesday night meeting.

"All the utilities would like to

have a decision on Susitna as soon as possible," Eric Yould, executive director of the power authority, told committee members.

Yould urged the lawmakers to speed up the decision. But environmentalist spokeswoman Virginia dal Piaz said she feared the decision to spend \$8 million on feasibility studies was actually a decision to build the dams, and questioned whether the need for the dam's power output had been adequately studied.

The committee turned down a proposed amendment by Rep. Hugh Malone, D-Kenai, for an additional \$200,000 study into alternatives to the Susitna project.

Before "committing railbelt consumers to a multi-billion dollar project," the state should study whether it is "probably as good as the next best alternative," Malone said.

Yould said the power authority would wait and see if Gravel was able to line up federal financial backstopping for the studies. The federal guarantee, which was cut from the last Congress in the heat of the Alaska land debate, would require use of the Corps of Engineers for the studies.

But if the federal legislation is not obtained, Yould said "there are a number of private engineering firms that have the capability of doing a project of Susitna's magnitude."

If a private firm does the studies, then the \$25 million figure could be lowered, Yould said. A private firm would only have to present information to the Federal Energy Regulatory Commission, which would then do the actual writing of the environmental impact statement, he said.

The ultimate test for the feasibility of the project would be whether Wall Street was willing to finance revenue bonds for actual construction, Yould said.

Construction costs for the dams have been estimated between \$2 billion and \$3 billion, with the first dam ready for use in about 15 years.

The committee debated whether smaller coal-fired plants or the huge hydro project could provide cheaper power in the future.

Yould argued that dams have long lives, and he cited lower electricity costs for Northwest states already using a high percentage of hydro power.

But Ms. dal Piaz said the "need for the large amounts of electric power that will be provided by the Susitna River dams project has not been demonstrated."

Backers Of Fish Tax Lower Rate

JUNEAU (AP) — Backers of a new raw fish for Alaska apparently have decided to lower their proposed taxation rate.

The Alaska Senate has passed a bill that would put an across-the-board 6 percent tax on raw fish. The measure (SB132) is now in the House, where amendments are expected.

Senate President Clem Tillion, R-Halibut Cove, says a new proposal under discussion would put the tax at 4½ percent for most species. As an encouragement for on-shore facilities, Tillion said floating processors would be taxed at 6½ percent.

Tillion said the pollock tax would remain at 1 percent and the tax would be set at 2½ percent for developing fisheries.

But Tillion cautioned that he was just relaying the proposal apparently worked out by House Speaker Terry Gardiner.

Gardiner declined to comment on the new proposal.

Meanwhile, Rep. Al Osterback, D-Sand Point and co-chairman of the House Resources Committee, expressed opposition to the newly proposed tax structure.

He said he was amazed that Tillion and Gardiner "are supporting such a radical tax increase to fishermen, without, at least, a study to review present fish tax laws and to determine what revenues are needed."

The Turkish ferry *Uskuda* capsized in the Sea of Marmora during a storm in 1958 and 361 lives were lost.

Antiquities Suit Will Be Heard Monday

Times Juneau Bureau

JUNEAU — Alaska's lawsuit against the Antiquities Act will come alive in hearings before U.S. District Court Judge James von der Heydt in Anchorage Monday, Attorney General Avrum Gross said.

The judge has kept the state's suit on hold pending congressional action on the Alaska lands issue. He allowed President Carter's 1978 withdrawal of federal lands under

Weekend Session Possible

Times Juneau Bureau

JUNEAU — The Eagle River delegation in the Legislature has canceled hearings tentatively planned for this weekend because of

STATE OF ALASKA THE LEGISLATURE

LEGISLATIVE AFFAIRS AGENCY

POUCH Y - STATE CAPITOL
JUNEAU, ALASKA 99811
907-465-3800

MEMORANDUM

April 4, 1979

SUBJECT: General obligation bonds for Susitna Phase I
(Work Order No. 6999)

TO: Representative Brian Rogers
Representative Hugh Malone

FROM: Billy G. Berrier, Director *BGB*
Division of Legal Services

A difficult question arises under Section 8 of Article IX, Constitution of the State of Alaska, which provides:

"SECTION 8. No state debt shall be contracted unless authorized by law for capital improvements and ratified by a majority of the qualified voters of the State who vote on the question. The State may, as provided by law and without ratification, contract debt for the purpose of repelling invasion, suppressing insurrection, defending the State in war, meeting natural disasters, or redeeming indebtedness outstanding at the time this constitution becomes effective."

The phrase "for capital improvements" is an unusual limitation on the power to issue general obligation bonds. (This limitation does not apply to enterprise revenue bonds because of the specific exemption in Section 11 of Article IX.)

Our court has not had before it that section of the constitution. Section 9 of Article IX which is the political subdivision lending section and which also contains the limitation that general obligation bonds be "for capital improvements" has been before the court. Section 9 provides:

"SECTION 9. No debt shall be contracted by any political subdivision of the State, unless authorized for capital improvements by its governing body and ratified by a majority vote of those qualified to vote and voting on the question."

In City of Juneau v. Hixson, 373 P.2d 743, (Alaska 1962), the constitutionality of the issuance of general obligation bonds of the city to provide land to the state as a site for its capital without cost to the state was before the court. The court decided the case solely on the constitutional question of whether or not the bond issue was for a capital improvement. It held the proposed bond issue was not for a capital improvement as required by Section 9 and enjoined issuance and sale of the bonds. The court in that case stated:

"The convention did more than substitute a new term -- it adopted a concept. We believe that it would be unwise for this court to attempt to provide an abstract definition of 'capital improvements'. We have concluded that it is beyond human ability to permanently circumscribe with mere words at a given point in time, a concept which, though limiting in one aspect, is otherwise intended to provide a broad, permanent and continuing authority for municipalities to finance present as well as unforeseeable future needs.

The trial court was correct in holding that the bond issue herein was not for a capital improvement. Assuming for the moment that the expenditure of the money could accomplish the desired objective, the end product would lack most of the attributes usually associated with the completed public project for which general obligation bonds have been sold. No permanent asset in the form of real or personal property would accrue to the city. The property acquired by the proceeds would be donated to the state. No thing of value would remain the property of the city. No improvement of general use or service to the taxpayers of the city would have been created by the expenditure. No tangible security for the bonded indebtedness would have been created -- in fact, the total security would have been reduced by the removal of some seven acres of downtown property from the city's tax rolls."

The court then held:

"Improving the welfare and prosperity of its residents and eliminating economic insecurity are legitimate laudable purposes, but we do not believe they can be financed on borrowed funds under the circumstances of

this case. If accomplished, the purposes would without doubt be improvements, but they would not be capital improvements."

The question of whether a project was a capital improvement was again before the court in Wright v. City of Palmer, 462 P.2d 326 (Alaska 1970). In that case the city proposed to issue general obligation bonds for the purpose of encouraging industrial development within the municipality. The mechanism contemplated was that the city would issue its general obligation bonds and use the proceeds for purchase of a site and the construction of a manufacturing and processing facility within the city. The facility would then be leased to a corporation for a period not less than 20 years which was the maximum permissible maturity of the bonds with the rental being fixed in an amount so that the total costs of the project, including amounts necessary to amortize the bonds would be payable as rent. Numerous conditions for economic benefit of the city were also to be included in the lease. Under this arrangement title to the property remained in the city and on termination of the lease, the right of possession of the property would be in the city. The court held that the bond issue and plan of expenditure did not violate the capital improvement requirement of the constitution stating:

"It is argued that in City of Juneau v. Hixson, 373 P.2d 743 (Alaska 1962), this court laid down a strict test of what constitutes a 'capital improvement,' rendering that term synonymous with 'public works of a permanent character.' Because an industrial development project is not clearly within that category, it is said that the plan before us must fail.

We do not read the Hixson case so narrowly. There we struck down a bond issue because no capital improvement would have resulted from the expenditure of the proceeds. The vice in the Hixson case was that raw land would have been acquired with the proceeds and would then have been donated to the State of Alaska as a proposed capitol site. As a result of the plan, the City of Juneau would have been left with no tangible asset in place of the indebtedness. Furthermore, the State of Alaska had entered into no agreement for and had not otherwise shown an interest in the acquisition or use of any capitol site.

By contrast, in the case before us the City of Palmer will own a tangible asset. The plan is that the indebtedness shall be retired out of the rental money received over the life of the bond issue. The land and building fulfill the definition of 'capital improvements' which was stated in the Hixson case as being 'associated with value represented by real or personal property in some form and with relative permanency.' 373 P.2d, at 747. There is here no giving away of the asset. On the contrary, the city's real ownership of the structure should increase as the years of rental payment go by. Even if the tenants should default, the building probably would be susceptible to a number of other beneficial uses. We conclude, therefore, that the bond issue and the plan of expenditure does not violate the capital improvement requirement of our constitution."

As mentioned earlier these cases construe Section 9 of Article IX relating to bonding by political subdivisions of the state not Section 8 of the article relating to bonding by the state itself. It is not uncommon for courts to construe powers of local governments more strictly than powers of the state. Nevertheless, the key phrase is identical and the purpose appears identical. Logic indicates the courts would construe both phrases as substantially identical in meaning. In my opinion, the court would adopt the reasoning in these cases in construing Section 8.

A feasibility study by definition does not of itself result in a capital improvement. While in this instance a tangible physical asset, the dam, is contemplated, the end product of the study would not be a dam but a "firm basis for recommending for or against construction of the project." (Army Corps of Engineers Plan of Study). No capital asset owned by the state would be acquired. If, in fact as in this instance, a capital asset is not being acquired, the statement in Hixon that "if accomplished the purposes would without doubt be improvements, but they would not be capital improvements" applies.

In my opinion general obligation bonds issued to pay costs of the feasibility study of phase one of the Susitna project would be a violation of Section 8, Article IX of the Constitution of the State of Alaska.

Page 5
April 4, 1979

In answer to the general question whether general obligation funds may constitutionally be issued to finance feasibility studies, it is conceptually possible that a fact situation could arise in which financing a feasibility study would necessarily result in a capital asset of the state being created although this seems unlikely. Each situation must be evaluated on the facts of that situation.

BGB:nem

SENATE JOURNAL

ALASKA STATE LEGISLATURE

ELEVENTH LEGISLATURE - FIRST SESSION

JUNEAU, ALASKA

Friday

January 19, 1979

Fifth Day

Pursuant to adjournment, the Senate was called to order by President Tillion at 10:06 a.m.

The roll call showed all members present except Senator Sackett who was excused from a call of the Senate today.

The prayer was offered by the Chaplain, Danny Plotnick, Lay Rabbi of the Juneau Jewish Community.

Senator Colletta moved and asked unanimous consent that the journal for the fourth legislative day and Senate and House Supplement No. 2 be approved as certified. Without objection, it was so ordered.

INTRODUCTION AND REFERENCE OF SENATE RESOLUTIONS

SENATE JOINT RESOLUTION NO. 6 by the Rules Committee by request of the Governor,

SJR
6

Relating to the Alaska Power Authority, the Phase I environmental, economic, social and engineering studies of the Susitna Hydroelectric Project, and the incurring of indebtedness for Phase I,

was read the first time and referred to the Resources Committee and the Finance Committee.

Governor's transmittal letter accompanying SENATE JOINT RESOLUTION NO. 6 follows:

SJR
6

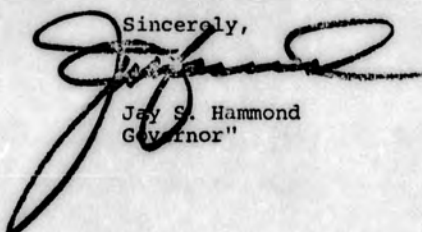
"January 18, 1979

President of the Senate
Alaska State Legislature
Juneau, Alaska 99811

Dear Mr. President:

Under the authority of art. III, sec. 18, of the Alaska Constitution, I am transmitting a resolution relating to the Alaska Power Authority, the Phase I environmental, economic, social and engineering studies of the Susitna Hydroelectric Project, and the incurring of indebtedness for Phase I.

Sincerely,



Jay S. Hammond
Governor"

INTRODUCTION AND REFERENCE OF SENATE BILLS

SB SENATE BILL NO. 63 by the Rules Committee by request of
63 the Governor, entitled:

"An Act making a special appropriation
for the Alaska Power Authority for the
Susitna Hydroelectric Project; and pro-
viding for an effective date."

was read the first time and referred to the Resources
Committee and the Finance Committee.

Governor's transmittal letter accompanying SENATE BILL
NO. 63 follows:

"January 18, 1979

SB
63

President of the Senate
Alaska State Legislature
Juneau, Alaska 99811

Dear Mr. President:

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 for the Susitna Hydroelectric Project.

Last year the Legislature passed House Committee Substitute for Senate Joint Resolution 50 amended House which authorized the Alaska Power Authority to sell bonds necessary to finance the completion of the Phase I studies which would lead to a determination of the environmental, economic, social and engineering feasibility of the Susitna Hydroelectric Project. Included in that resolution was a provision which made such a bond sale contingent upon the passage of federal legislation which would provide a federal guarantee of the bonds and allow reimbursement to the State if the project was determined unfeasible. Because the last Congress failed to pass this guaranteeing legislation, the Legislature no doubt wishes to reassess its prior action.

It is Senator Gravel's intention to resubmit his proposal to Congress, in order to continue with the previously contemplated schedule for the completion of Phase I studies. Nevertheless, it is necessary to consider other interim financing alternatives because federal authorization would come too late to do geological, biological and engineering tests during the 1979 summer season. The possibility of a one year delay must be carefully weighed along with the many uncertainties surrounding a project which I believe will prove to meet the three pertinent criteria by which all such projects should be adjudged: is it environmentally acceptable, economically feasible and do the majority of the people desire it.

Several weeks ago, upon the recommendations of the Alaska Power Authority, I agreed to submit a request for funding sufficient to keep current evaluation studies on track. Subsequently, developments attending imposition of the Antiquities Act and projected revenue losses have, of course, raised additional questions.

Regardless, in fulfillment of that commitment, I am submitting for your consideration a supplemental appropriation request in the amount of \$8,178,000. These funds will be used to guarantee the sale of the necessary bonds to finance the first year of the Phase I studies. I have been informed by the Alaska Power Authority of the necessity for positive action on this

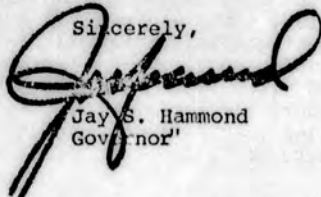
January 19, 1979

SB
63

proposal by approximately mid-February if the Corps of Engineers is to mobilize contractors and move equipment to the study sites before breakup. However, legislative approval of this supplemental request is only one of a number of actions which must be taken if the studies are to proceed on time. In addition, the Corps must receive approval by the federal Office of Management and Budget to enter into an agreement by which the State finances its activities in regard to the project. Approval must also be received from village corporations which have lands adjacent to the project sites, and finally, the Internal Revenue Service must sanction the complex financing arrangement which the APA has proposed.

Due to the obvious complexity of the situation, including the possibility of complete State financing of the entire \$25 million study effort should the Congress fail to adopt Senator Gravel's proposal, I request that you take the earliest opportunity to consider this appropriation and its companion resolution in order to satisfy yourselves that this is the proper way to proceed on this project.

Sincerely,



Jay S. Hammond
Governor

CONSIDERATION OF THE CALENDAR

CITATIONS

Senator Colletta moved and asked unanimous consent that the Citation - In Memoriam - Clarence Kramer - by Senators Meland and Ziegler, be approved. The Senate approved the Citation unanimously and it was referred to the Secretary for transmittal to the House.

Senator Colletta moved and asked unanimous consent that the Citation - Honoring the Memory of Ann Stevens - be sponsored by all Members of the Senate. Without objection, it was so ordered.

Senator Colletta moved and asked unanimous consent that the Citation - Honoring the Memory of Ann Stevens be approved. The Senate approved the Citation unanimously and it was referred to the Secretary for transmittal to the House.

UNFINISHED BUSINESS

President Tillion appointed the following members to a Special Committee on Electoral Reform:

Senator Kelly, Chairman
Senator Fahrenkamp
Senator Malcahy

SPECIAL ORDERS

Senator Kerttula moved and asked unanimous consent that he be excused from a call of the Senate, January 22. Without objection, Senator Kerttula was excused.

Senator Summer moved and asked unanimous consent that he be excused from a call of the Senate, January 22. Without objection, Senator Summer was excused.

ANNOUNCEMENTS

Budget & Audit	Rm 423, Capitol	1:30 p.m., 1/20
Resources SB 51, SJR 5 SB 21, SB 14	Rm 207, Capitol	1:30 p.m., 1/22
Judiciary SJR 2, SB 7, SB 28, SB 52	Rm 209, Capitol	1:30 p.m., 1/23

ADJOURNMENT

Senator Colletta moved and asked unanimous consent that the Senate adjourn until 10:00 a.m., January 22. Without objection, the Senate adjourned at 10:21 a.m.

Peggy Mulligan
Senate Secretary

January 1979

Dear Brian

From reading the News-Miner, it sounds as if the Susitna study funds are not yet ~~dead~~ dead for this year. If they are resurrected, I thought you might like the following information.

The justification for the project is based on 1) increasing population 2) increasing per capita consumption of electricity and hence 3) increasing load demand (annual and peaking). Projections for these three factors were made in 1974 by the APA and, with some modification, seem to be still used by Susitna advocates. Therefore justification for the project can be validated by looking at the five years of data that now exists relative to these projections. When this is done, some interesting things appear, such as

Population - FNSB	1974	1978	avr. annual change
Actual	58,007	60,845	+1.7%
Projected	—	67,230	+3.7%

Energy / Customer (MUS & GVEA)

Actual			
• Residential sector	12,110 kWh	10,152 kWh	-3.5%
• Commercial sector	73,621 "	83,156 "	+2.5%
• Total customers	23,367 "	21,295 "	-1.9%
Projected			
• Residential sector	—	12,753	+7.0%
• Total customers	—	24,608	+7.3%

Annual Load Demand

Actual	343.8 million kWh	429.3 million kWh	+4.6%
Projected	330.0 " "	550 " "	+10.7%

Regarding the annual load demand, it is interesting to see how accurate the projected rate of increase is.

Projected		Actual	
1978	550 mil kWh	1978	429.3 mil kWh
1979	330 " "	1979	343.8 " "
projected increase	<u>220</u> " "	actual increase	<u>85.5</u> " "

~~220 / 85.5~~

85 $\overline{) 220.00}$ 2.57

In other words, the APA forecast in only five years had an error of 257%. Considering that 1979 doesn't look much different, every consumption wise for Fairbanks, their marginal error should become even greater.

I hope you can use this information to prevent a lot of expense for a useless study. [The state doesn't need to spend \$25 million to determine ^{that} the project, as presently described, is a loser.]

Sincerely
Georg Weitz

The Soft Path . . .

AN EXCITING CHALLENGE FOR ALASKA

by George Matz

Two hundred years ago, an Englishman named Adam Smith laid the foundation for the Industrial Revolution when he published *Wealth of Nations*. Essentially, this led to an economic era based on the exploitation of nonrenewable resources rather than renewable resources. Today, this exploitation extends to virtually every corner and pocket of the earth.

The Energy Crisis of 1973, followed by a sequence of other resource crises, has brought industrial societies face to face with the realities of the law of diminishing returns. All but the most staunch industrialists now recognize that changes are needed. A more renewable post-industrial society must be forged.

It was another Englishman, E. F. Schumacher, who described the foundation for a post-industrial society when he published *Small Is Beautiful* in 1973. Schumacher called his concepts intermediate technology although most people now refer to them as appropriate technology or a.t. The thrust of a.t. is almost the opposite of industrialization in that it emphasizes development which tends to be of a smaller-scale, less complex, labor-intensive and less disrupting to the environment. It also relies on resources which are local and renewable. That does not ignore, however, that some products of industrialization are beneficial and have no acceptable alternative.

Amory Lovins, with his publication of "Energy Strategy: The Road Not Taken" in *Foreign Affairs* (Oct. 1976), has put Schumacher's thesis into more technocratic terms by referring to a.t. as the "soft path" and energy/capital-intensive industrialization as the "hard path." As a result, the terms a.t. and soft path are often used interchangeably by many of its advocates.

Every society needs a challenge to which they can respond. Consequently the concepts of Schumacher, Lovins and others have been spontaneously and enthusiastically endorsed by many throughout the world.

Alaska is no exception. A.T. advocates in Alaska see it as a means by which the state can go from a pre-industrial to post-industrial society without having to contend with the environmental and cultural desecrations that usually come from industrialization. In fact, Alaska may be the barometer by which to gauge the acceptance of a.t., nationally and perhaps internationally.

Why Alaska? A simplistic answer is that old adage "if it works here it will work anywhere."

But there is more. In essence, Alaska has all of the reasons to follow the soft path and few justifications to even consider the hard path.

To delve into this, we need to look at some of the key features of Alaska. As we all know, Alaska is a large state with nearly all of its population in widely dispersed clusters. This argues against the development of large centralized electrical power generating facilities with interties throughout even portions of the state (i.e. proposed Susitna hydroelectric project) but favors alternative energies that are community oriented (i.e. windpower).

Alaska's physiography is one of contrasts. There are vast areas of the state which are flat, mountainous, wet, dry, cold, temperate, windy, calm, etc. Each of these conditions require a custom made human environment rather than some assembly line package from the lower-48. Often, standardized products do not work very well in Alaska.

Alaska's infrastructure, both institutional and physical, is not highly developed. Choosing the soft path requires adoption not change. We don't have to rework a lot of obsolete laws or public projects. That's an especially important point.

By virtue of statehood and Prudhoe Bay, Alaska is a wealthy state. Its land and revenues provide a generous public resource for its residents. Consequently, the state is in a position where it can afford to experiment with a.t. projects, yet not sacrifice vital public services. Also, the soft path may provide the best approach for Alaskans to perpetuate their public nest egg.

Relative to what is left in the lower-48, Alaska has vast renewable resources, but most are thinly spread. A sustained yield harvest of these resources may often limit resource utilization to small-scale, decentralized projects.

Alaska has some vast concentrations of non-renewable resources, but the high cost of labor, energy and transportation often makes exploitation uneconomic. Of course, the government can intervene and subsidize much of the risk and costs (i.e. Delta barley project) but that runs counter to public sentiment. Alaskans have been firm in demanding that development pay its own way.

Advocates of (d) (2) often state that Alaska represents our first and last chance to do it right; to establish land management systems which protect a significant portion of Alaska's wildlife, scenic, wilderness and cultural values. What few have stated however is that Alaska also has the opportunity "to do it right" with business management systems. For example, most Native regional corporations, which are beginning to play a significant role in the state's economy, have demonstrated a social consciousness for their respective region. They tend to make a distinction between being profitable and maximizing return-on-investments. A corporation that is concerned only with ROI can not afford to internalize diseconomies or intangible social costs.

If Alaska is to follow the soft path, its greatest resource will be its people. Alaskans, by tradition, are resourceful, self-reliant people who know the land and who tend to dislike big government, big business, or big labor. They insist on having control of their own destiny. Such attitudes are a good match with the spirit of a.t.

From what has been said it may sound as if Alaska is a natural for the soft path. It is, but there are significant barriers. There are strong pressures from outside and even from within to have Alaska become part of the world economy, to increase our level of import and export. To do so requires a social and economic infrastructure which comfortably interfaces with standardized industrial operations rather than an infrastructure which is tailor made to the land and its people. In other words, industrialization requires that the land and its people change even more than the accelerated changes that have already been stimulated by the trans-Alaska pipeline.

What has not been fully realized is that change to an industrial society is one of following a well worn path. There are 49 other states that we can look at as examples. By contrast, the unblazed soft path requires imagination and leadership. It's a new era of pioneering.

Alaska is now at a crossroads; to follow or to lead. Our choice will determine whether Alaska will be the last frontier or the lasting frontier.

Funding Information:

General Fund: \$ 8,178,000
Other Funds: -0-
\$ 8,178,000

Introduced: 1/19/79
Referred: Resources and
Finance

BY THE RULES COMMITTEE BY
REQUEST OF THE GOVERNOR

1 IN THE SENATE

2 SENATE BILL NO. 63

3 IN THE LEGISLATURE OF THE STATE OF ALASKA

4 ELEVENTH LEGISLATURE - FIRST SESSION

5 A BILL

6 For an Act entitled: "An Act making a special appropriation to the Alaska
7 Power Authority for the Susitna Hydroelectric Project;
8 and providing for an effective date."

9 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

10 * Section 1. The sum of \$8,178,000 is appropriated, subject to the con-
11 ditions set out in sec. 2 of this Act, from the general fund to the Alaska
12 Power Authority for the purpose of providing a reserve for revenue bonds to
13 be issued by the authority to finance Phase I feasibility studies of the
14 Susitna Hydroelectric Project.

15 * Sec. 2. The appropriation in sec. 1 of this Act is conditioned upon
16 (1) repayment, of the full amount appropriated, to the State of Alaska when
17 it is no longer required, due to the availability of other funding, for the
18 purpose specified; and (2) payment of any earnings on the amount appro-
19 priated in sec. 1 to the State of Alaska.

20 * Sec. 3. This Act takes effect immediately in accordance with AS 01.-
21 10.070(c).

22 *amend*
23 *Sec. 2/ approval by the federal gov't of ~~payment~~ ^{funding} for*
24 *the study*

25 *Sec. 3/ This act takes effect after the report by UAA*
26
27
28
29

4/17/79 Susitna / House Resources

Yould

① number of studies of a/k/a

② excess demand - will not attract industry, & many other costs

③ load projections - all studies to date
state Susitna power will be fully utilized when it comes online
lacked by utility projection

④ Project will be staged
Watana - ~~B~~ > 6.9
Devil's Canyon

1.9
2.8
4

... "come under scrutiny by NEPA..."

- what is ~~NEPA~~? I thought it was an act?

EPA signoff needed

area - selected by 6 Native Villages
overselected by Cook Inlet

Chatterton - wants State to have title & land,
not draft agreement.

DNK - wanted value for buying, need results
of study

Have agreement for access

Will have to buy them out - cheaper now
than later, but maybe zero later.

Private Sector's plan of study - less than 8 million.
FERC will write EIS

Will not be able to spend 8 million
until ~~September~~ Oct 1

I'd like to do some encumbering of that 8 million
myself.

Malone - prefer out-front direct app. to
revenue bond approach

Should appropriate money for independent economic
analysis

appropriate \$17 million to Governor -
let him make decision for Plan B

~~Oversight Committee~~ - No

Feel guarantee may be essential for financing

Susitna

The proposed Susitna dams site feasibility study is another example of government's habit of wasting taxpayers' money to obtain bits of irrelevant information. Such a study would make sense only if it promised to provide some information essential for making a sound decision. If, for example, the proposed project were well conceived and soundly thought out, and the only preliminary question remaining was that of the physical suitability of the site, then the study would be worthwhile. Such is not the case, however, with respect to the Susitna dams project. With a few minutes' thought it becomes obvious that:

- (1) the project makes no economic sense;
- (2) it's not needed;
- (3) it's downright harmful; and
- (4) there's very little chance of the feds' giving it to us for Christmas.

The current advertised cost is \$2.6 billion. As these things go, it's safe to say that the final tab would be substantially higher: probably \$3 billion or more. Even a low simple rate of interest of, say, 10%--one that barely stays ahead of inflation--would mean an annual cost of about \$300 million for interest alone. That comes to about a thousand dollars a year for every man, woman, and child in the railbelt. To repay the principle over the life of the dams would, of course, require much more. (How much more can't be determined with any certainty, since nobody can predict how long a high dam on a glacial river in earthquake country would last.) Then, if one actually wanted electricity, instead of to just have a couple of dams to look at, the costs of operation, maintenance, and distribution would also have to be added on. This isn't a very promising path to cheap light bills.

It's often assumed that if a lot of electrical generating capacity were available the railbelt would bloom into a major industrial center. While that's certainly a possibility, it doesn't necessarily follow. That assumption is a version of Say's Law, which says that supply creates its own demand. Though that law has been useful in economic theory, it obviously has its limitations if one tries to apply it too literally to a particular enterprise, since in the marketplace merely producing something doesn't guarantee that it can be sold at a profitable price. Location decisions are based on a complex of considerations. Electrical generating capacity is a significant factor for only certain industries. Aside from the question of whether those industries would be desirable neighbors, there's little evidence that lack of generating capacity is their limiting factor at this point.

Another assumption that's often made is that money spent, no matter how wastefully, somehow stimulates the economy and adds to the general welfare. This isn't very sound reasoning, since it ignores opportunity costs. In a finite world, resources allocated to one use are not available for another. For a true evaluation of an enterprise, the benefits attributable to it must have deducted the benefits that could have been derived from the best available alternative use for the resources. While private enterprise in a free market is subject to this discipline, public works projects are able to sidestep much of it by assigning dollar values to intangibles that are claimed as social benefits, and by using a lower-than-market rate of

interest when figuring costs. Much of the public confusion about this stems from the fact that the benefits, in the form of the thing built, the payrolls, etc. are concentrated and visible; whereas the costs, in the form of taxes, inflation, and environmental degradation are diffused and hidden.

It's a shell game that governments have been putting over on us for a long time now. It only works as long as the con artists are few and slick, and the suckers are numerous, gullible, and have real, hard-earned money to keep putting up. There are indications that the marks are catching on. This is cause for either alarm or hope, depending on how we react to our enlightenment. If many of us try to indulge the fantasy of ourselves becoming successful cons, then we're in for hard times. If, on the other hand, we call off the game and start insisting that those in positions of trust behave responsibly, then maybe there's hope.

The assertion that this project is vital to our well being; that without it we'll freeze in the dark, or at least stagnate, and maybe slip back to the stone age, doesn't stand up very well to close scrutiny.

Most estimates of projected electrical demand are grossly overstated. Electricity is a specialized form of energy that is only needed for certain tasks. Low grade uses such as water heating, space heating, and cooking are handled more efficiently by other forms. Then, too, much of the electricity that is used for appropriate tasks is wasted by sloppy habits and inefficient appliances. This pattern of misuse and waste has come about, in large part, as the result of pricing policies utilities have had in the past that served to encourage consumption.

To meet the real needs of the future, utilities have available any number of options for increasing generating capacity in increments at the proper time and place. We have ample supplies of hydrocarbons to meet our immediate needs and to give us time to develop the technology needed to move from our present system to a sustainable one. Oil and coal will play their part, and natural gas is especially promising as a transition fuel. It is clean burning, abundant, and its appliances and distribution system can later be used with methane and hydrogen.

Alaska's energy potential for the more distant future must be one of the highest on the planet. It would be hard to imagine a more energized environment than a tectonically active peninsula of great relief, interposed between the arctic highs and the storms of the North Pacific. The technology for tapping into this is still embryonic, but it seems reasonable to believe it's going to develop. And if it does, a huge, centralized dam and transmission line complex would be a cumbersome fossil; serving only to remind future generations of our shortsightedness. For it's not likely they'll thank us if we, while standing at the threshold of a new era, insist on burdening them with an inflexible 19th century solution to a 21st century problem.

If this dam project were only a foolish waste it would be bad enough, but it goes beyond that. It's a wounding of the life sustaining systems of the whole region. The richness of the life in the

waters off Alaska and on the land itself is dependent on the complex, intimate interaction between the land and the sea through the rivers and streams. If we're going to live here, we must be careful to nurture this process, and to certainly avoid needlessly interfering with it. Every time a stream is carelessly blocked by logging slash, every time sewage or poisonous chemicals are allowed to escape into the living waters, every time silt is allowed to choke spawning gravels, the system that sustains us is put under a little more stress. Damming a major river represents a crippling blow. Such an act could only be excused if done out of dire necessity.

Money spent by summer visitors is an important part of Alaska's economy. People are lured north by the promise of something different from their everyday surroundings. Wildness is the most important part of that difference. Man-made attractions are a dime a dozen, but real wildness is rare. When the highest mountain and the wildest river of a continent are found within sight of each other, one can only hope mother nature's pearls aren't wasted.

The pattern in the past has been to build anything, no matter how wasteful, unnecessary, or harmful it might be, so long as the federal government could be conned into paying for it. That may be harder to pull off in the future. For the new perception of Alaska that has emerged in the lower 48 over the past few years, coupled with the economic winter coming on, may make the lambs reluctant to come to their fleecing. Concerning this project, if the feds won't cough up a few paltry millions for the feasibility study, it's unlikely that they'll later fork over billions to build it. More likely, in fact, would be constituents tarring and feathering any lower-48 congressman who voted to fund a multi-billion-dollar project whose only beneficiaries were what were seen as a handful of oil-rich boomers.

Actually, the bill to fund the study should be more properly titled, "The Alaska Power Authority Bureaucrats' Lifetime Employment Security Act." The plan seems to be to use these studies to keep the scheme alive; and then, in a few years, some time when we're feeling flush from gas pipeline construction and there's a lot of oil and gas revenue flowing into the state treasury, to slip a big construction bond issue by us.

Soapy really should give those boys a few more lessons. They think big enough, but they lack style.

Frank Ivy

Box 81116
 Volney 99708

 rec'd 4/6/79

clat
Pia 2
H.S. Roach
fil

April, 1979

Concerns About the Susitna Hydro-Project

1. The projected energy demand used by the Army Corps of Engineers is totally unrealistic.

The need for the large amounts of electric power that will be provided by the Susitna River Dams Project has not been demonstrated. Total residential industrial electrical energy consumption in the railbelt area was about 1.9 billion kilowatt hours (KWH) in 1977. The two Susitna dams will produce 6.9 billion KWH, over 3-1/2 times the amount of energy needed to meet 1977 consumption. The Army Corps of Engineers has continued to use the highly inflated and unrealistic growth projections made by the Alaska Power Administration (APA) to justify the Susitna project. [Public involvement in APA's (a federal bureaucracy) projections has been conspicuously lacking, and APA has commonly manipulated statistics to suit their needs and bolster their arguments for excessively large future energy demands.] For example, when APA has projected energy demands for the Alaska railbelt (i.e., the Anchorage-Fairbanks area), they have included the energy needs of the Kenai Peninsula and of the military. In fact, the power needs of the Kenai Peninsula will primarily be met by the Bradley Lake hydro-project. The military in Alaska has always generated its own power in the past and very probably would not use a centralized, highly vulnerable energy source such as Susitna, in the future.

The APA's projected growth patterns include a doubling to tripling of railbelt population in less than 20 years and a continued annual increase in per capita energy consumption of 3% or more per year. These projections result in energy demands of four to ten times present needs by 1995. The most recent trends in population growth and energy conservation in Alaska make such projections totally unrealistic. In fact, statistics from Golden Valley Electric Association (GVEA), the major commercial utility in the Fairbanks region, show that their per customer energy consumption is declining in Fairbanks. During the past three-year period, GVEA residential and commercial/industrial per customer usage has declined at average rates of 12.5%/year and 5.5%/year, respectively. Statistics from Anchorage utilities and from APA show that the annual increases in per customer usage have tapered significantly in the Anchorage area over the past three years. Total energy consumption in the Fairbanks area actually declined in 1978. Present energy consumption in Fairbanks is running considerably below what had been projected for this community in the Corps of Engineers' initial feasibility study.

The Corps of Engineers has overestimated future power needs before. This occurred when justifying the construction of the Snettisham dam near Juneau. The dam was built by the Army Corps of Engineers and is administered by the Alaska Power Administration. Although brought on line in 1973, the Juneau Power Utility is buying only one-fifth of the total capacity of the project. Consequently, the cost of power to the utility company is over twice the rate the Corps originally anticipated. Because of the slow growth in load, in order to cover the interest rates on the bonds that funded this project, it is expected that the price will again be increased in 1985 by 75 to 80 percent. With a much bigger project such as the Susitna, such a mistake would be a financial disaster.