

MEMORANDUM

State of Alaska

TO: DISTRIBUTION

DATE: July 25, 1980 - Estes ✓

FILE NO:

TELEPHONE NO: 465-4100

FROM: Ronald O. Skoog, Commissioner
Department of Fish and Game

SUBJECT: Mitigation Policy

There is a need to develop a Department policy addressing methods of dealing with adverse impacts upon fish, game and their habitat which may result from poorly planned or improper development activities. To this end, I have enclosed for your review a proposed Department policy on mitigation of fish and game habitat disruptions. I have directed the Habitat Protection Section to coordinate the collection of comments from throughout the Department, and to finalize the draft policy or revise it for further review as appropriate. Please give careful consideration to this provisional policy and submit any comments to the Habitat Protection Section by August 11.

Enclosure

DISTRIBUTION

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Steve Pennoyer, Commercial Fish Division
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ALASKA DEPARTMENT OF FISH AND GAME

STATEMENT OF POLICY
ON MITIGATION
OF FISH AND GAME HABITAT DISRUPTIONS

Prepared March 1982

ALASKA DEPARTMENT OF FISH AND GAME

Statement of Policy on Mitigation of Fish and Game Habitat Disruptions

I. The Need for Policy

Logging, construction, mining, agriculture, and other developmental industries which use land or water are of great importance to many Alaskans. When properly pursued, these undertakings can be compatible with proper management and use of Alaska's valuable fish and game resources. However, improper practices can lead to significant degradation of the State's fisheries and game resources through alteration or destruction of important habitat components.

Development includes a multitude of practices such as road building, bridge construction, culvert placing, excavation, dredging, clearing, dragging, dumping, and other activities. At issue is land and water, the very bases of all development and all fish and wildlife habitat. Each development action requires space, and thereby alters fish and game habitat and compromises other types of uses. Development activities, when disruptive to fish or wildlife resources, may, for example, increase erosion or sedimentation, divert, obstruct, alter, or pollute water flow, aggravate temperature extremes, alter and destroy populations of animals and vegetation, reduce food supplies, restrict movement of fish and game, disturb or destroy spawning, nesting and breeding areas, change adjacent or downstream habitats, or change the capacity of a stream or wetland to store and use storm or flood waters.

Often, such habitat losses are inevitable and little can be done to prevent or control them, but often they can, in the public interest, be abated or

"mitigated." The overall mitigative goal of the Department of Fish and Game is to maintain or establish an ecosystem with the project in place that is as nearly desirable as the ecosystem that would have been there in the absence of that project. The decision levels through which a project is reviewed - preventing, minimizing, and replacing ecosystems - is outlined and discussed in this policy.

The magnitude of developmental influences on fish and game habitat is to a large extent dependent on the degree to which development operations and facilities and land or water use projects are properly planned and upon the conscientious adherence to practices designed to protect fisheries and wildlife values. Therefore, it is the primary objective of the Department of Fish and Game that fish, game and habitat values be prominently considered by developers and regulatory agencies prior to development or issuance of regulatory approvals. Consideration should take place during the planning and implementation of land or water associated development to avoid or minimize foreseeable or potential adverse environmental effects before the fact of damage, and early enough to consider beneficial alternatives. Similarly, it is imperative to provide for repair, restoration, or rehabilitation of habitat damage after it occurs, should it occur at all, as well as maintenance of the reconstructed habitat over time. However, it is appropriate that this option of after-the-fact redress assume a second priority status to mitigation planning before the fact of damage.

These concepts--preventing, minimizing, replacing--when molded into a working definition of mitigation, will contribute to the sustained functioning of aquatic and terrestrial systems, and the continued viability of common

property fish and game resources, while providing for the other needs of Alaskans arising from beneficial public land and water use programs. A mitigation policy, therefore, is essential to guide, not stop, development actions by insuring considerations of alternatives to or in land and water conversions and to fulfill the sustained yield management precepts of Alaska law.

II. Authority

The Department's basic responsibility as a conservation agency derives from the Commissioner's authority to manage, protect, maintain, improve, and extend fish, game, and aquatic plant resources of the State (AS 16.05.020). This Statute, in combination with constitutional directives, provides implicit direction for the Department to offset losses to fish, wildlife, and their habitat.

The Department's responsibility to impose mitigation measures also derives from the same laws which authorize it to issue written approvals (permits) for land or water use programs. In each instance the developer must obtain the Department's approval as the sufficiency of the developer's plans to provide for free passage of fish (AS 16.05.840), or provide proper protection to fish and game when conducting projects in anadromous fish streams (AS 16.05.870), State game refuges (AS 16.20.060), State game sanctuaries (AS 16.20.120), the natural habitat of endangered species (AS 16.20.185), fish and game critical habitat areas (AS 16.20.260), and State range areas (AS 16.20.300-320).

Simultaneously, a strong basis for prescribing mitigation lies in the public trust doctrine. In simple terms, this doctrine, founded in common law, asserts the public's right to unimpaired use of public lands and waters for fish and wildlife production. The Department, as trustee for the public, is obligated to protect that right. The public trust doctrine thus provides additional ability as well as an obligation to be rigorous in mitigating disruptions to public fish and wildlife resources, including their habitat.

III. Statement of Policy

A. Definition

The directive to mitigate is clear. The nature of and extent to which mitigation is carried out is left to the Department's discretion. In considering mitigatory options it is essential to recognize the differing degrees of stress that may be placed on natural fish and wildlife habitat. Lightly-stressed aquatic or terrestrial systems adjust to change, and recovery takes place through natural processes when the stress is removed. In contrast, a heavily or overstressed natural system cannot restore itself to original conditions through natural processes alone. In this case, the system's capacity for maintenance and repair has been impeded, and at this point man must provide assistance for the system to be restored. These differences in recovery potentials dictate different priority approaches to implementing mitigation measures.

Accordingly, the Department of Fish and Game, when administering mitigation measures pursuant to its permit authority under AS 16, embraces

the definition of mitigation promulgated in the Federal regulations (40 CFR 1508.20) which effectuate the National Environmental Policy Act (42 U.S.C. 4321 et seq.). Mitigation includes, in priority order of implementation:

- (1) avoiding the impact altogether by not taking a certain action or parts of an action;
- (2) minimizing impacts by limiting the degree or magnitude of the action or its implementation;
- (3) rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- (4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;
- (5) compensating for the impact by replacing or providing substitute resources or environments.

B. Implementation

The Department will implement the five forms of mitigation pursuant to its statutory authority in the following manner:

1. Mitigation to Avoid or Minimize Habitat Damage

a. Avoidance

The Department's primary approach to mitigation is one of preventive conservation designed to avoid an evershrinking base of natural habitats and costly man-assisted restoration efforts. It is founded on preventing adverse, predictable, and irreversible trends or changes in natural aquatic or terrestrial systems. The objective is to maintain as much existing natural habitat as possible, even if the relative importance or interrelationships of living organisms are not fully known. Apart from denying outright the issuance of a permit, this can be accomplished by attaching stipulations or conditions to permits for proposed developments. Discretion at the field level is required to allow tailoring of various developmental activities to sites and times for maintenance of individual or groups of fish and game species and various habitats used annually or seasonally. Mitigation by permit stipulation can be employed to avoid activities in areas with a high risk of adverse impact, such as nest sites, winter ranges, or critical habitat. Development consistent with the objectives for designated areas can proceed according to the stipulations or conditions. This fundamental approach provides for beneficial land and water use programs in natural systems.

b. Minimization

This concept differs from avoidance in that it is acknowledged that some habitat damage will occur. The Department recognizes that land

and water development projects are mandated by public need, legislative or constitutional prioritization or land use, or pervading economic considerations. It is recognized that industrial, agricultural and residential development in Alaska will cause some amount of habitat destruction, and that this damage has been accepted by developers and policy makers as the price of economic benefit. The second priority mitigative approach to habitat management is to make that loss less severe, or to minimize foreseeable disruptions to aquatic and terrestrial systems. The focus of this approach is to maintain habitat diversity and the capacity of each system to restore itself naturally from stress or damage, while accommodating preemptive uses of land and waters frequented by fish and wildlife - uses which may reduce species abundance to some degree or cause some disturbance to natural species behavior.

Minimal adverse habitat disruption may be achieved by permit stipulations which limit development actions when and where necessary and to the extent needed to maximize conservation of fish and wildlife values. For example, temporal mitigation measures, which involve adjusting the timing of project activities to reduce impacts in areas of high risk, can be used to restrict development to the seasons when the impact is least, or to reduce the amount of time spent in a sensitive area. Habitat may be stressed temporarily, but recovery can take place through no-cost natural processes.

2. Mitigation In Lieu of Habitat Damage

3. a. Rectification

The third priority mitigative approach is to repair, rehabilitate, or restore abused aquatic or terrestrial systems. This requires onsite or post-construction evaluations of water and land developments after the fact of damage, or estimation, during the planning stage, of likely environmental damage. Rectification is less desirable than avoidance or minimization because, even if restoration is complete, there is a net loss of fish and wildlife resource and habitat resulting from the time lag between the impact and full replacement. Such time lags may vary from days to decades. Thus, gains or benefits to be realized from this form of mitigation are somewhat less than those of full prevention.

The objective is to restore the same functions as those that were lost, or, to restore the habitat to pre-disturbance conditions. However, if the factor restricting the number of a species using an area is also limited further by the development, it makes little sense to devise and implement factors which cannot alleviate that situation. Additionally, the simplistic view of maximizing one kind of habitat at the expense of another should be avoided. The Department recognizes that there will be situations where no rehabilitation of the loss incurred is possible.

If proper planning occurred and rectification was not considered necessary, rectification should only be necessary when the developer has not complied with his plan, applicable laws, permit stipulations. Rectification of disruptions to habitat may be implemented through permit stipulations and amendments or imposed as a court ordered penalty. It is likely that many completed or partially completed projects can be retrofitted with feasible restoration requirements that could result in the recovery of substantial amounts of project-caused fish and wildlife losses.

4. b. Preservation and Maintenance Actions

Mitigation should be recognized as a continuing obligation, inextricably tied to a project and carried out during the entire life of the project. The Department recognizes that if mitigation measures are approved but not operated and maintained during the life of the project, little or no mitigation, which may have helped justify the project in the first place, will be realized. The Department holds to the principle that costs of mitigation are all normal costs of any land or water development project and must be borne by the developers and beneficiaries of the project.

Preservation and maintenance operations may be imposed through permit stipulations or amendments to permits. For example, drainage structures installed in fish streams should be required to be maintained properly, and erosion must be corrected when it occurs. Revegetated areas which are not successful, for whatever reason,

must be revegetated until they have become established. In these ways, adverse impacts will be reduced or eliminated over time.

A requirement (or permit stipulation) that developers continue to mitigate by maintenance operations during the life of the project will ensure that conservation objectives are met and litigation is avoided.

c. Compensation

5. Whenever a project will cause a reduction or loss of values to the public--losses in terms of fish and wildlife populations or habitat, recreation opportunities, access, and other foregone resource use opportunities--the project sponsor must create or restore an equivalent part of the aquatic or terrestrial ecosystem to compensate for the loss. The most difficult problem encountered with this approach is determining what kind of action is appropriate and how much mitigation is adequate. The problem can be resolved qualitatively, through negotiation and quantitatively through the establishment of evaluation procedures.

It is the Department's position that compensation should not involve a simple payment of dollars, but instead should involve replacement of lost habitat, populations or recreational opportunities.

Compensation by replacing or providing substitute resources or environments is the least desirable form of mitigation because it

accepts loss of habitat at the outset and often cannot result in total reparation for those losses. When it must be implemented, however, the preferred form of compensation is onsite mitigation; that is, all damage caused by a project should be replaced within the development site or project area where damage occurs. The same functions as are lost should be directly restored, replaced, or compensated. Only secondarily should compensation by substitution, or trade-off of an unavoidable ecological loss for an ecological improvement elsewhere, be used. Trade-offs or conversions only change one kind of environment for another, and may be desirable or not, depending upon the viewpoint considered. There are divergent views and interests between local and more distant users regarding the value of the ecological "improvement" to the natural system that was already in place.

Any type of compensation will be costly, and the values of lost resources cannot be measured solely through economic cost/benefit ratios or man-day evaluations. This sort of analysis must be accompanied by evaluations which measure factors other than human uses of land, water, and the resources within. The value of the interdependent biological relationships within an entire ecosystem is too often ignored. Since some ecosystems, such as wetlands, may never be successfully replaced or substituted, it is important that the land owner, developer, and the various government agencies work together to salvage such lands to rectify the loss of the resource values of those areas. The Department recognizes, however, that in

some rare cases, the only compensation negotiable may be prevention of future losses in another or adjacent area.

C. The Role of Planning

Proper mitigation of fish and game habitat losses requires that land and water use projects be properly designed and planned. This requires basic decisions by field personnel at the earliest project conceptualization or design state, before permits are issued.

Proper planning, particularly at the area or regional level, will assist in abating a common cause of fish and wildlife habitat decline, that of piecemeal habitat losses which cumulate from sequential projects. Regional or area planning, when it precedes significant land or water use programs, will allow reduction of the cumulative effects resulting from a variety of projects.

Prior to permit issuance there should be a realistic assessment of the specific losses which likely will be incurred. The losses should be identified first in terms of lost resources and secondly in terms of the uses which may be foregone. This is because human use and resource productivity do not always correlate. The Department cannot accept analyses which equate low human use figures to low estimates of losses. Low human use has no bearing on how much fish, wildlife, or their habitat may have been lost; or how much productivity, biological diversity or critical processes were impaired. However, the loss of human use should be a factor that will need to be mitigated.

Losses of fish and wildlife habitat that cannot be mitigated will affect the people who utilize those resources. Wherever the carrying capacity of the land or water is reduced, harvest of species by subsistence, commercial, and recreational users may have to be reduced. Recreational opportunities to view resources may also decline. As the population of the State of Alaska increases, competition for fish and game resources will surely increase. Decreased abundance of these resources will mean that some resource users will get less of the resource than they may have had in the past. As more and more habitat is damaged or lost, the problem of a growing population base and its pressure on fish and wildlife, will be aggravated.

The impacts of a proposed project and alternatives to it on all the natural resources affected, therefore, should be assessed early in the project planning process. The effects of a project on other resources, such as timber or water, and human use should be assessed, as well as the direct effect on fish and wildlife. Nonstructural alternatives, e.g., providing minimum stream flows rather than a hatchery to maintain a population of fish, for achieving the project objective should be required and considered first since these could be expected to have the least negative impact on the ability of the project area to provide natural resource values.

Including consideration of all natural resources early in the planning process should lead to development of ways to minimize effects on these resources in all phases of project development and reduce the need to later add on the more costly, conspicuous, and less desirable remedies

after the fact of damage. The specific properties and characteristics of the natural system which must remain after development should be defined prior to initial permit issuance. The developer is then allowed to proceed with the project under pre-established mitigation measures, which will guarantee functioning of a natural system and not cause permanent or costly public harm.

D. Assessment of Damages

The combination of population pressures, diminishing space, energy needs, and the necessity of considering economic variables in most decisions have all culminated in questions regarding the intrinsic values of man's surroundings. Attempting to place price tags on an area's worth, whether in terms of its retention as a natural system or its value in an altered condition, is inherently difficult.

The state of the art in habitat valuation will lag behind the need to make permit decisions. The Department holds that fish and wildlife habitat should be preserved unless the expected benefits of the development is demonstrably "large" relative to loss of fish and wildlife values. Of course, what is deemed acceptable must be a broad social decision which necessarily requires assessment of the resource damage likely to be incurred as a result of the development.

In theory, it would seem a simple matter to observe the impact of a construction project, determine if fish or wildlife are killed, and then assess damage. In practice, it is anything but. Damage may be

incremental, and not identifiable without extensive baseline and post-project data. Mortality may affect juveniles as well as adults. Damage to habitat or to populations of juveniles may not impact resource users or be measurable for several years hence when particular species should have reached adulthood. Other damages, such as those affecting migratory species or the lower elements of a marine food chain, may be visible but not amenable to market place valuation. Less tangible aspects of resource damage include decreased aesthetic worth and decreased ability to provide a specific wildlife habitat. Finally, in an environment possessing many, often only partially understood, natural interrelationships - and impacted by any number of man-related activities - definitive assessment of precise cause and effect relationships between development impacts and fish or wildlife mortalities will be difficult and often impossible.

This problem is intensified by the absence of even rudimentary data at a large number of site-specific locations. It follows that assessment of damage will, at best, be a combination of assessment of the partial data base available concerning stock levels, seasonal and cyclical abundance and location, together with a scientific judgement of the "most likely" result of environmental damage, based on a general understanding of fish and wildlife habitat dependencies and tolerances.

These types of judgements put extreme pressure on fish and wildlife scientists and pose unknown risks for the resource. In such cases, and where the only other alternative is to stand mute and observe a steady

erosion of fish and wildlife values - uncorrected and uncompensated for - a judgement decision is necessary.

The Department holds that the appropriate standard for measuring damages to natural resources is the cost which would be reasonably incurred by the State to restore or rehabilitate the environment in the affected area to its pre-existing condition, or as close thereto as is feasible without grossly disproportionate expenditures.

The question is prompted: at what point do indirect or cumulative effects become so remote that mitigation should not be required? The Department recognizes the "without-the-project" baseline assumption for resource evaluation purposes when imposing mitigation measures. It is from this baseline that the degree of project impact, and hence the degree of mitigation required, may be measured.

Because damage estimates will be based upon scanty or incomplete knowledge, and will often be probabilistic in nature, it is possible that estimates of "most likely" level of damage may, from time to time, vary. It is this Department's belief that in such cases of difference, the onus of proof to explain any lower estimates must lie with the developer. This position is based upon the recognition that the developer is the potential beneficiary of both an early start (relative to time required for adequate environmental inventory) and of any lower damage estimate that is put forth.

IV. Summary

- (1) Mitigation is necessary to guide development in order to preclude, abate, repair, or indemnify the adverse effects upon fish, game, and their habitat resulting from development projects in fish streams and in refuges, sanctuaries, critical habitats, and the natural habitat of endangered species.
- (2) Department's authority to approve development plans in streams and special areas, as well as the public trust doctrine asserting the public's right to unimpaired fish and game production on public lands, provide the means and the obligation to compel mitigation measures.
- (3) Differences in recovery potentials due to differing degrees of stress placed upon fish, game, and their habitat dictate that mitigation measures be selected accordingly.
- (4) Mitigation before the fact of damage is the preferred means, with avoidance of damage as the primary objective, and minimization rectification, maintenance, and compensation following in that order. Each may be implemented through permit stipulations.
- (5) Mitigation measures imposed after the fact of damage or in lieu of expected damage, may require rectification of damage, maintenance of corrections over time, or compensation by replacing or substituting resources or environments.
- (6) Rectification, necessary only when the permittee has not fulfilled his obligation, may be imposed by permit stipulation or by court ordered

penalty. Projects may be retrofitted with feasible restoration requirements to recover fish, game, and habitat losses.

- (7) Maintenance mitigation actions are project related. The Department holds that maintenance mitigation costs are normal development costs to be borne by the developer and project beneficiaries. This form of mitigation may be imposed by permit stipulations or later amendment.
- (8) Compensation by providing substitute resources or environments is the least desirable form of mitigation. When imposed it preferably should be implemented onsite rather than by "improving" an existing ecosystem elsewhere. Compensatory mitigation will only be implemented by negotiating a written agreement with the developer.
- (9) Mitigation should be considered at the earliest project conceptualization or design stage. All impacts should be assessed early in the project planning process with first consideration given to nonstructural alternatives to the project objective.
- (10) Fish and wildlife habitat should be preserved unless the public benefit of the project is demonstrably large. Assessment of damages will be a Department decision based in part on existing data bases and in part on "most" likely judgements.
- (11) The burden of proof to justify lower estimates of damage to fish and wildlife habitat lies with the developer.

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DEPARTMENT OF FISH AND GAME

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Statement of Commissioner Ronald O. Skoog to
Alaska Power Authority Board of Directors regarding
Susitna Hydroelectric Project Feasibility Report

FR 16 APR 82

The Alaska Department of Fish and Game appreciates the invitation extended by Mr. Conway to provide the Alaska Power Authority (APA) Board of Directors with this Department's views concerning the "feasibility report" on the proposed Susitna Hydroelectric Project. We have not had sufficient time to review the report in detail, but nevertheless do have some comments to make.

In his January 26 letter to the Department, Mr. Conway stated, "Specifically, we wish to know if, in the area of your agency purview and based on information available to date, you judge the proposed project to be cost effective, environmentally acceptable, technically sound, and in general in the best interests of the people of Alaska." My Department's expertise is limited to the second area of concern--"environmentally acceptable"--and therefore my comments will be confined to that. Higher authority than

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mine will judge whether or not the project is "cost effective", "technically sound", and "in the best interests of the people of Alaska."

In support of my response to Mr. Conway's request, I am providing the Board a copy of a March 12, 1982, letter and enclosures from my office to the Northern Alaska Environmental Center. This correspondence will provide additional background information outlining this Department's views. My comments today restate many of our prior positions, comments, or advices pertaining to the proposed Su Hydro project.

At the present time, this Department does not believe that the potential environmental impacts of the proposed Susitna Hydro Project from the fish and wildlife perspective can be evaluated adequately, because

- 1) The information and analysis to date are not sufficient to identify the full range and magnitude of potential impacts the project will have on fish and wildlife; and, therefore
- 2) It is unknown as to which mitigation alternatives can or should be applied to offset these impacts.

Absent an adequate evaluation of impacts and applicable mitigation alternatives, we cannot hope to evaluate the environmental costs, the feasibility of mitigation, or the

tradeoffs of fish and wildlife resources and habitat that may be involved. The costs of mitigation should be included as an integral part of the appraisal of the overall costs of the proposed project.

This Department also is unable to conclude at this time whether this proposed hydro project is environmentally sound. It has been this Department's general advice that a minimum of five years would be required to assess and understand project impacts to provide the basis for developing mitigation alternatives. To date, the limited data and impact analysis by the APA's contractor, Acres American (Acres), and the incomplete analysis of mitigation measures do not reflect accurately the actual level of knowledge available thusfar from data collected by the Department this past year. Another constraint upon an acceptable environmental evaluation has been the inadequate time scheduled for impact evaluation and mitigation planning to meet the requirements of State and Federal laws, regulation, and policy regarding fish and wildlife resources.

It has been our general perception that in order to meet predetermined project construction deadlines, the Alaska Power Authority has tended to diminish the views expressed by our agency and others concerning important resource issues, including the level of information that agencies

consider essential to minimize or avoid conflicts on unresolved issues or informational deficiencies which can arise during the review process of the Federal Energy Regulatory Commission (FERC) license application. The APA has had an opportunity to address agency concerns on project issues for over two years, yet generally has remained unresponsive to suggestions to develop a process for formal substantive interagency coordination. Instead resource agencies have had to work on an informal basis through the Susitna Hydro Steering Committee (SHSC). ADF&G recommended in 1979 that this committee, which includes members of my staff, be established with a more formal role than it has now.

I would like to reaffirm that I fully support this committee and the advisory role to the APA they have attempted to fulfill. The SHSC has made a serious attempt to provide advices on project deficiencies and on interagency and interdisciplinary study coordination needs to the APA. (See enclosed copy of letter to Eric Yould from Alan Carson.) APA should recognize and give attention to the concerns the SHSC has advanced even though it has operated only on an informal, advisory basis.

I suggest that the resolution of these concerns about the project prior to initiating the FERC license process application might well be a more prudent course to follow

and might well result in a shorter time-frame for license approval than what might occur should the license application later prove deficient. Additionally, to initiate the application process prematurely with insufficient data probably will result in an undesirable polarization between the APA and the State/ Federal agencies on unresolved resource issues. There are two fundamental elements of resolution that we believe would be desirable before the application for a FERC license is made:

- 1) Completion of one additional year of fish and wildlife baseline data collection, including commitment of budgetary and manpower resources, before attempting an evaluation of habitat-wildlife relationships.

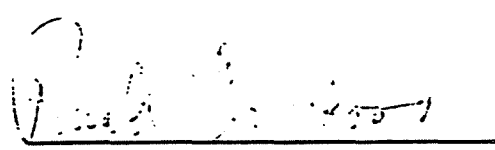
Particular emphasis needs to be given to the aquatic habitat and instream-flow program of the Alaska Department of Fish and Game. The methodologies involved and data collected are essential to quantifying project impacts on Susitna River fishery resources and to some extent can be applied to impacts on terrestrial wildlife resources. This past year, the ADF&G aquatic studies were limited to collection of baseline information.

The impact analysis and mitigation alternative planning role was delegated solely to Acres-American and Terrestrial Environmental Specialists (TES). In our opinion, Acres and TES underestimated the time and manpower resources required to analyze and prepare an impact evaluation from the large amount of information collected by this Department and other project participants. In recent discussions with APA staff, it has been suggested that ADF&G perform the technical analysis of data we collect in FY 83 to assess project effects on habitats. We would accept this role and function provided that a comprehensive interdisciplinary instream flow study program is implemented.

The FY 83 program that ADF&G proposes should be supportive to and supported by field data collection and efforts of other study contractors. There should be some assurance that other important study elements in water quality and hydrology, for example, will be collected and, when applicable, analyzed and made available so the ADF&G can make an objective assessment of project effects on aquatic habitats.

- 2) It is of primary importance that APA initiate a formal program of coordination with State and Federal Agencies to review and identify unresolved project issues, scope of studies, and agency expectations with regard to mitigation planning. APA needs to respond to agency recommendations and to develop an organization, process, and strategy to deal with unresolved project issues prior to submitting the FERC license application as well as with any issues identified after submission during the application review process.

Thank you for the opportunity the APA Board of Directors has afforded the Department of Fish and Game to express our views.


Ronald O. Skoog

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APA

DIVISION OF RESEARCH & DEVELOPMENT

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ANCHORAGE, ALASKA ~~XXXX~~ 99510

The issues identified below have been placed in two categories. The first entitled "Overall Study Approach" deals with those issues and concerns which transcend specific studies. These concerns are not entirely in the scope of the feasibility study contract or necessarily the sole responsibility of the Power Authority. However, the decisions the APA and Legislature may make with respect to the Susitna project in the next 60 days could obviate these concerns. The other category is entitled "Study Specific Issues" and is self-explanatory.

Alaska Dept. of Fish & Game
Sport Fish/Susitna Hydro

The following are the overall study approach problems identified:

OVERALL STUDY APPROACH

1. The most urgent and most important issue is the relationship between the timing of findings from studies conducted by Acres American and its subcontractors and when the State of Alaska will decide whether to build Susitna. The problem is that existing law may result in a decision by the state as to whether the dams should be built before the socio-economic and environmental costs, impacts, and trade-offs are known. Although the March 15, 1982, Susitna Hydroelectric Feasibility Study may assist in determining if the dams can be built in a narrow technical (engineering and constructability) sense, it cannot speak to significant public policy questions such as:

a. is it in the best interests of Alaskans to use their money to build the dams?

b. what are the environmental and socio-economic impacts and trade-offs that have to be made if it is decided to build the dams?

In determining answers to such questions, there are accepted methods which should be rigorously applied. No one would consider building the Susitna dams without answering all questions about soils stability and earthquake hazards. The same level of assured knowledge needs to be acquired to answer questions about environmental and socio-economic effects of the dams.

This issue may be outside the scope of the Acres contract and the sole purview of the Power Authority. A combined effort of the Power Authority and the Governor's Office may be needed to comprehensively frame the issue and devise methods to deal with them.

2. There appears to be a lack of necessary coordination between the various study tasks. Unless extraordinary corrective efforts are made, it is unlikely that an integrated, relevant, and complete environmental assessment which is acceptable to state and federal agencies and to the Federal Energy Regulatory Commission (FERC) will be produced. This need was identified early by the SHSC. The November 21, 1980, review of the Plan of Study says: "The Steering Committee members believe the most compelling need is for a well conceived process to improve the linkage and coordination of the various studies." As an example of this, I refer you to point number 1 below.

The following are studies specific issues:

SPECIFIC ISSUES

1. A coherent and coordinated Fish and Wildlife mitigation policy and plan needs to be established immediately. It is our understanding that, unlike the wildlife mitigation options, the fisheries mitigation options

and the overall Susitna Hydroelectric Project fish and wildlife mitigation policy have yet to produce an agreed upon product. The following issues still require resolution: agreement on mitigation policy, agreement on the roles definition of the APA, the agencies with fish and wildlife authority and expertise, the Federal Energy Regulatory Commission (FERC), and those agencies with land and water management authority. Until these issues have been resolved, determination of the full costs and impacts of the proposed Susitna Hydroelectric project are not possible. Failure to settle these issues will dramatically increase the probability of delay in action by the FERC, unnecessary confrontation between the APA and government management and regulatory agencies and litigation in the courts. Once resolution of the identified issues occurs, the FERC application process may be the appropriate forum to resolve specific mitigation issues.

2. There is a lack of information to describe the relationship between various stream flow levels and the productivity of fisheries and aquatic habitat downstream from the proposed Devil Canyon Dam. Exhibit E of the FERC application for license requires quantification of the anticipated downstream impacts.
3. The fisheries studies have not been going on long enough to acquire the comprehensive data and knowledge needed to assess project impacts. This, coupled with inadequate instream flow studies, provides for a less-than-satisfactory answer to questions on the impact of the proposed hydroelectric project on fishery populations.
4. Wildlife studies and wildlife mitigation appear much further developed than the fisheries issues described above. However, there are issues yet to be resolved in the wildlife area. I refer you to the February 16, 1982, letter from the Department of Fish and Game to Robert Mohn of APA. It appears that additional work is needed to identify realistic mitigation measures for lost wildlife habitat and on relating wildlife use of an area to habitat characteristics.
5. Public review of the Phase I environmental reports and of most mitigation options discussion papers is now scheduled to occur separately from the distribution and public review of the draft feasibility report. We do understand that the decision to delay for 90 days the application for a license to FERC (assuming that that is the decision from the State of Alaska), the public and agencies will be provided the opportunity to review the detailed study results and data reports for a period of 60 days before final agency comments on the feasibility study are due.
6. The Fairbanks-to-Anchorage Intertie study and the Susitna feasibility study should be integrated. We suggest that the intertie assessment be included in the Susitna feasibility study review package.
7. The decision on access to the dam sites and the policies surrounding their use after construction will be one of the most significant impacts

March 5, 1982

of the project. The Yukon River to Prudhoe Bay Haul Road built in conjunction with the construction of the Trans-Alaskan oil pipeline is a comparable situation. There is no need to restate the comments made by the SHSC and their parent agencies to the APA on this matter. However, it is appropriate to identify two of the major issues with respect to the access question. First, APA's need to begin construction of a pioneer road prior to FERC licensing of the dams raises some serious public policy issues. Second, the decision as to the mode of access (rail versus conventional road) may well be the determining factor for the extent and type of public access once construction is completed.

8. The socio-economic implications of the availability of 1600 megawatts of electrical power in the railbelt region of Alaska need to be fully described and discussed in a public forum. It would appear that this amount of electrical energy could result in industrialization and socio-economic impacts on the same order of magnitude as would petrochemical development. Because the State of Alaska is sponsoring this hydroelectric proposal, it is incumbent upon the state to provide and present in a public forum, information regarding the end use of the power and advantages and disadvantages of the socio-economic impacts of this end use. The SHSC recommends consideration of an approach similar to that which was done for the Dow-Shell petrochemical proposal.

The SHSC will be advising their respective parent agencies of the contents of this letter in order to insure that formal agency comments to the proposed Susitna feasibility study fully address the issues and concerns detailed above. In order to alleviate the problems identified above, the SHSC recommends the following: (1) The APA should take an interdisciplinary interagency approach in identifying ways to improve coordination of the environmental and socio-economic studies to insure that the scope of and the methodology used in the studies are acceptable and germane. This approach should be funded and staffed appropriately and should have the responsibility, authority and independence to accomplish this objective. (2) The draft instream flow study plan should be updated and made public to provide opportunity for agencies and other groups to participate in the development of the necessary instream flow studies. (3) Comprehensively evaluate all potential and secondary impacts to fish and wildlife both above and below the Devil Canyon and Watana Dam sites. (4) Provide public participation opportunities to: inform the public of the feasibility study and the socio-economic impacts of this project and to provide an opportunity for the public to give comments and advice to the Power Authority Board of Directors before the state determines what course of action it should take on this project.

Because of the nature of some of these suggestions as well as the extent of discussion we anticipate will be required before APA and its

Eric Yould

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March 5, 1982

contractors fully comprehend our concerns, the SHSC is prepared to meet with you, your staff and contractors whenever you wish.

Sincerely,

Al Carson

Al Carson, Chairman
Susitna Hydroelectric Steering Committee

cc: SHSC Members

Charles Conway, Chairman, APA

Ernest Mueller, Commissioner, Dept of Environmental Conservation

Ronald Skoog, Commissioner, Dept of Fish & Game

John Katz, Commissioner, Dept of Natural Resources

Lee McAnerney, Commissioner, Dept of Community & Regional Affairs

Curtis McVee, State Director, Bureau of Land Management

Robert McVey, Regional Director, National Marine Fisheries

Keith M. Schreiner, Regional Director, US Fish & Wildlife Service

Reed Stoops, Director, Division of Research & Development

S. Leopold

Quentin Edson, FERC

ESTES

SUSITNA HYDROELECTRIC PROJECT

Preliminary Final Plan of Study

Fish and Wildlife Studies

proposed by the

Alaska Department of Fish and Game

NOV 79
FG POS.

November 1979

ESTES

SUSITNA HYDROELECTRIC PROJECT

Preliminary Final Plan of Study

Fish and Wildlife Studies

proposed by the

Alaska Department of Fish and Game

November 1979

ESTES

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

LAY S. HAMMOND, GOVERNOR

111 RASPBERRY ROAD
ANCHORAGE 99502

October 31, 1979

Mr. Eric Yould, Director
Alaska Power Authority
333 W. 4th Avenue
Anchorage, Alaska 99510

Dear Mr. Yould:

The Alaska Department of Fish and Game is providing the enclosed Phase I 25 month portion of the 5-year fisheries and wildlife study proposed to be conducted as part of the Susitna Hydroelectric feasibility investigations. The proposals were developed following discussions with Acres-American and their environmental studies subcontractor, Terrestrial Environmental Specialists. We have also met with representatives of the U.S. Fish and Wildlife Service and the Alaska Department of Natural Resources to obtain their suggestions and advice relative to portions of our proposals and the development of a final revised plan of study. I must indicate, however, that it should not be inferred that USFWS and ADNOR have formally endorsed these proposals in their entirety. Their formal positions regarding the entire revised plan of study will undoubtedly come during the next agency and public review stage.

In his letter to me on October 4, Robert Mohn of your staff discussed a number of issues and subject areas which required our input on the development of the revised plan of study. The information provided herein should satisfy part of those requirements outlined by the APA, but specific refinements addressing our concerns outlined in our attached proposal and comments of other agencies will be needed during the period Acres or the Corps of Engineers is revising the POS next month.

Sincerely,



Thomas W. Trent
Regional Supervisor
Habitat Protection Section

cc: Representative R. Halford
Representative B. Rodgers
Commissioner R. O. Skoog - ADF&G
Commissioner E. W. Mueller - ADEC
Commissioner R. E. LaResche - ADNOR

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PROGRAM JUSTIFICATION

The programs proposed by the Alaska Department of Fish and Game (ADF&G) are the first phase of a five year study program, necessary in the opinion of this Department, to meet the provisions of numerous federal and state laws and regulations providing for the consideration of fish and wildlife values in pre-project planning and evaluation of impact assessment, project possibility determination, mitigation of probable impacts should the project be constructed, and surveillance and monitoring during and after project construction. The biological objectives and justification are explained in the task work plans; the statutory and regulatory mandates for conducting these proposed work plans are outlined hereafter:

Federal/State Laws

Fish and Wildlife Coordination Act (FWCA)

The Fish and Wildlife Coordination Act, draft uniform procedures for compliance; May 1979 further standardizes procedures and interagency relationships to insure, "that wildlife conservation is fully considered and weighed equally with other project features in agency decision making processes by integrating such considerations into project planning, National Environmental Policy Act (NEPA) compliance procedures, financial and economic analyses, authorization documents, and project implementation."

As stated in the Federal Register (Vol 44, No. 98) this Act applies not only in the project area, but wherever project impacts may occur.

Subpart B FWCA Compliance Procedures

Sec. 410.21 Equal consideration

Equal consideration of wildlife resource values in project planning and approval is the essence of the FWCA compliance process. It requires action agencies (the Alaska Power Authority, APA) to involve wildlife agencies (the Alaska Department of Fish and Game and U.S. Fish and Wildlife Service, USFWS) throughout their planning, approval, and implementation process for a project and highlights the need to utilize a systematic approach to analyzing and establishing planning objectives for wildlife resource needs and problems and developing and evaluating alternative plans.

Sec. 410.22 Consultation

(a) Initiation. The FWCA compliance process may be initiated by a potential applicant, an action agency, or a wildlife agency.

(b) Potential Applicants. Implementing procedures of action agencies shall provide that applicants for those non-federal project approvals which require a water-dependent power project approval from the Federal Energy Regulatory Commission (FERC) (also applies to preliminary FERC permit) contain written evidence that they initiated the FWCA compliance process with both Regional Directors and the head of the State wildlife agency exercising administration over the fish and wildlife resources of the state(s) wherein the project is to be constructed.

The intent of this paragraph (a)(1) of this section is to assist applicants in designing environmentally sound projects without waste of their planning resources and to minimize the potential for delay in the processing of applications. Action agency implementing procedures shall advise that consultation should be initiated by the applicant at the earliest stages of its project planning, and that its submissions to wildlife agencies shall indicate the general work or activity being considered, its purpose(s), and the general area in which it is contemplated.

National Environmental Policy Act (NEPA)

The Council on Environmental Quality (CEQ), Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR, Parts 1500-1508, July 30, 1979) specifies provisions requiring the integration of the NEPA process into early planning, the integration of NEPA requirements with other environmental review and consultation requirements, and the use of the scoping process.

Clean Water Act

Section 404 of the Clean Water Act of 1977 and regulations for implementation of the permit program of the Corps of Engineers (33 CFR, Parts 320-329, July 19, 1977) requires that a Department of the Army permit(s) be obtained for certain structures or work in or affecting waters of the United States. The application(s) for such a permit(s) will be subject to review by wildlife agencies.

Executive Order 11990 (Wetlands)

This order was issued "in order to avoid to the extent possible the long-term and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative," and Executive Order 11988 (Floodplains) was issued "to avoid to the extent possible the long-term and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative." All federal agencies are responsible to comply with these EO's in the planning and decision-making process.

Endangered Species Act

Section 7(c) of the Endangered Species Act, 87 Stat. 884, as amended, requires the APA to ask the Secretary of the Interior, acting through the U.S. Fish and Wildlife Service, whether any listed or proposed endangered or threatened species may be present in the area of the Susitna Hydroelectric Power Project. If the Fish and Wildlife Service advises that such species may be present in the area of the project, the APA is required by Section 7(c) to conduct a Biological Assessment

to identify any listed or proposed endangered or threatened species which are likely to be affected by the construction project. The assessment is to be completed within 180 days, unless a time extension is mutually agreed upon. No contract for physical construction may be entered into and no physical construction may begin until the Biological Assessment is completed. In the event the conclusions drawn from the Biological Assessment are that listed endangered or threatened species are likely to be affected by the construction project, the APA is required by Section 7(a) to initiate the consultation process.

Water Resources Council, Principles and Standards

The principles and standards for Planning Water and Related Land Resources (18 CFR, Part 704, April 1, 1978) were established for planning the use of the water and related land resources of the United States to achieve objectives, determined cooperatively, through the coordinated actions of the Federal, State, and local governments; private enterprise and organizations; and individuals. These principles include providing the basis for planning of federal and federally assisted water and land resources programs and projects and federal licensing activities as listed in the Standards. The President in his June 6, 1978 statement further defined federal water policies.

State Laws

Title 16

Title 16, independently of Federal laws, mandates the Alaska Department of Fish and Game to manage, protect, maintain, enhance, and extend the fish and game, and aquatic plant resources and the habitat that sustains them including assisting the U.S. Fish and Wildlife Service in the enforcement of federal laws and regulations pertaining to fish and wildlife.

Sec. 16.05.870 also states that:

(b) If a person or governmental agency desires to construct a hydraulic project, or use, divert, obstruct, pollute, or change the natural flow or bed of a specified river, lake or stream, or to use wheeled, tracked, or excavating equipment or log-dragging equipment in the bed of a specified river, lake, or stream, the person or governmental agency shall notify the commissioner of this intention before the beginning of the construction or use.

(c) If the commissioner determines to do so, he shall, in the letter of acknowledgement, require the person or governmental agency to submit to him full plans and specifications of the proposed construction or work, complete plans and specifications for the proper protection of fish and game in connection with the construction or work, or in connection with the use, and the approximate date the construction, work, or use will begin, and shall require the person or governmental agency to obtain written approval from him as to the sufficiency of the plans or specifications before the proposed construction or use is begun.

Purpose. The purpose of this section is to protect and conserve fish and game and other natural resources. 1964.
Att'y Gen., No. 10

Alaska Coastal Management Program

The recently approved Alaska Coastal Management Program (ACMP) mandates that all State, Federal and Local government agencies must coordinate all planning and development activities in the State's coastal zone to ensure adequate consideration and protection of Alaska's coastal waters and resources. As the proposed Susitna Hydropower project will occur within Alaska's coastal zone and certainly will directly influence coastal waters all planning and development plans must be consistent with the Coastal Standards and the Mat-Su Borough's District Coastal Plan once it is completed and approved. The Coastal Standards are presently in effect and all State and Federal actions must be consistent with them. Section 6AA C 80.130 states that:

(a) habitats in the coastal area which are subject to the Alaska Coastal Management Program include:

- (1) offshore
- (2) estuaries
- (3) wetlands and tidal flats
- (4) rocky islands and sea cliffs
- (5) barrier islands and lagoons
- (6) exposed high energy coasts
- (7) rivers, streams and lakes
- (8) important upland habitat

These habitats which are specifically defined in the Standards must be identified within the Susitna Hydro Study area during the feasibility studies. In addition, Section (b) states that habitats contained in (a) of this section shall be managed so as to maintain or enhance the biological, physical and chemical characteristics of the habitat which contributes to their capacity to support living resources. Specific guidelines are also provided for each coastal habitat. The Coastal Zone Management consistency requirements are mandated in both the Alaskan and Federal CZM Acts and the Fish and Wildlife Coordination Act. The Question of consistency with CZM standards goes well beyond the FERC licensing requirements and should be treated as a separate step in determining the feasibility of Hydro Power alternatives.

The Alaska Department of Fish and Game has a strong mandate under these laws to insure that adequate planning study and evaluation of the fish and wildlife resources in the Susitna Hydro Project area are completed and become a part of the decision making information used to determine project feasibility. If the project is constructed these studies will be the basis for mitigation plans or the formulation of mitigation studies to offset project impacts. Mitigation as defined in Section 1508.20 of the National Environmental Policy Act Implementation Regulations

- (a) Avoiding the impact altogether by not taking a certain action or parts of an action.
- (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- (e) Compensating for the impact by replacing or providing substitute resources or environments.

ISSUES, PROBLEMS, CONCERNS AND RECOMMENDATIONS
REGARDING THE SUSITNA HYDRO PLAN OF STUDY

Project Review and Interagency Coordination

Because of the magnitude of the Susitna Hydroelectric Feasibility Study, continuous coordination in accord with the Uniform Procedures for compliance with the Fish and Wildlife Coordination Act will be best accomplished through formation of a Susitna Hydroelectric Steering Committee. The function of this committee would be to provide coordinated exchanges of information between the Alaska Power Authority and interested resource management agencies. Through this exchange, the concerns of all agencies involved would be identified early and hopefully prevent unnecessary delays in the progress of the feasibility study.

We propose that the Steering Committee be composed of representatives of resource agencies with responsibilities pertaining to the Susitna Hydroelectric Feasibility Studies (ADF&G, ADEC, ADNR, USFWS, USGS, and NMFS). This committee would provide for interagency coordination through joint review of project related materials and for development, through convening the committee, of more informed and uniform positions representing all resource interests to be transmitted to the applicant. This we believe provides that applicant with a more efficient process for information exchange.

The objectives of this committee are to:

1. develop plans of study which are based upon full agency participation throughout each phase of the planning process;
2. select the resource specialists who will undertake the required studies and investigations;
3. insure that the biological and related environmental studies, their timing, and technical adequacy are planned, implemented, and conducted to provide the quantitative and qualitative data necessary to: a) assess the potential impacts to fish and wildlife resources; b) provide the basis for mitigation and compensation of resource losses which will result from the project at the time of submission of a FERC license application; and c) select the favored mitigation and/or compensation alternative from the product generated by "b";
4. provide the forum for continued project review to jointly develop all aspects of the studies and to provide for a timely exchange of information and for redirection of studies should the accomplishment of specific objectives be in jeopardy;

5. assure that the studies are conducted in compliance with all state and federal laws, regulations, Executives Orders, and mandates as they apply to fish and wildlife resources; and

6. provide unified agency comments from the committee to the applicant.

The Susitna Hydroelectric Steering Committee should convene on a regular basis as dictated by planning and review requirements. However, it seems appropriate to meet at a minimum on a monthly basis to exchange reports and to be advised of progress toward objectives by the Alaska Power Authority and principle investigators. A record of agreements reached, recommendations and comments provided, and responsibilities assigned in meetings should be distributed to all parties involved.

Progress reports should be submitted to members of the committee quarterly. Comments from the committee to APA would then be submitted at a pre-established time thereafter. Comments provided to the Alaska Power Authority should be appropriately addressed and incorporated into project documents.

The participating members of the committee must have free access to all data collected during the study. In addition, principal project personnel should be accessible to members of the committee in case clarification of any aspect of the field studies is required.

Phase I Studies Initiation

The programs outlined in the work plans are scoped into a 24 month time frame for Phase I field work and one additional month covering Phase I annual report development during January 1982. The completion of several of these studies between January 1980 and January 1982 is not considered feasible.

A large amount of materials, equipment and scientific gear will be required for these studies. Many of these items will require ordering well in advance of the date on which they would be employed in the field. For example, major sonar and radio-telemetry development is anticipated for anadromous adult stock assessment and migrational work. The Bendix Corporation, the supplier of the sonar equipment the Department uses, has indicated a minimum of 18 months from order to delivery of sonar equipment. Also, members of the USFWS who have utilized radio-telemetry in the State have indicated an up to one year delay in the fielding of that equipment until radio frequencies are approved by the FCC.

New State personnel regulations may also affect this Department's timely implementation of studies unless an expedited procedure for employing staff dedicated to these studies is developed. If funds are released on January 1, 1980, several months will be required to obtain the staff needed to begin field work in 1980. These staff are crucial to the continued progress of specific planning and organizational work which

must necessarily begin as close to January as possible or further study delay will be encountered.

Allowance must be made for the impacts of equipment and personnel constraints on the ability of this Department to conduct the proposed fish and wildlife studies. These are realities which must be dealt with and are fundamental determinants of the adequacy of the work we have proposed to do.

Phase II Studies

A major position of the Department for the past several years is that many of the biological studies must be conducted through a five year period to provide the basic cyclical, environmental information needed to evaluate project impacts and the mitigation requirements or alternatives that are available. In the time availed us, we have not been able to provide a specific budget or work plan proposal for the studies that may be required in the years succeeding Phase I into Phase II, and it may not be reasonable to do so at this stage.

An acceptable Plan of Study must insure that studies are continued into Phase II. It is the position of this Department that study continuation and redirection should be based on the outcome of Phase I information. The proposed Susitna Hydroelectric Steering Committee, which has been proposed herein, is an important group, in our opinion, to insure scoping and budgeting of Phase II studies are executed in a consistent and systematic fashion.

Socioeconomic Considerations

Of primary importance to this Department is Objective 4: to determine the economic, recreational, social, and aesthetic values of the existing resident and anadromous fish stocks and habitat.

This objective will enable the Susitna Hydro environmental studies to assess the socioeconomic impacts on commercial, recreational, and subsistence users and industries supporting them. Over half of Alaska's growing population resides in the proximity of the impact area. Not only this population, but commercial fishermen, recreationists, and businesses from throughout the nation and other countries may be affected by the hydroelectric project. The popularity of Denali State Park and nearby Mt. McKinley National Park further attests to the high social, recreational, and aesthetic qualities of the area.

The basic problem in regard to the Susitna Hydro POS is to define and conduct the studies which will adequately evaluate the socioeconomic (monetary and nonmonetary) and cultural values of fish and wildlife and

the habitat that supports them when comparing them with other (more tangible) monetary resource values and uses associated with hydropower development.

It must be emphasized that to ultimately select the best uses of the natural resources of the Susitna Basin from which society will receive the most long term benefit, the net benefits (total benefit minus total costs) must be adequately evaluated. Consequently, values must be assigned to each potential resource use. When monetary terms are inappropriate, agencies will need to devise nonmonetary means of evaluating impacts to fish and wildlife resources. Existing regulations require agencies such as the Corps of Engineers (COE) or the Alaska Power Authority (APA) to search out, develop and follow procedures reasonably calculated to bring environmental factors to peer status with dollars and technology in their decision-making. NEPA directs action agencies to "the fullest extent possible":

Identify and develop methods and procedures which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations (42 U.S.C. §4332 (a) (B)).

These methods should quantify habitat values which are equivalent to the extent and type of habitat affected by the planned project and estimate the quantity and quality of habitat needed to be acquired and/or improved to mitigate loss. It can then be determined if the socio-economic impacts of the project can be mitigated and at what cost. Furthermore, the Water Resources Council directs action agencies to devise nonmonetary means of evaluating fish and wildlife impacts:

When effects cannot or should not be expressed in monetary terms, they will be set forth, insofar as is reasonably possible, in appropriate quantitative and qualitative physical, biological or other measures reflecting the enhancement or improvement of the characteristics relevant to the type of effect under consideration (38 F.R. 24797).

As a result, the often-cited excuse that the evaluation of supposedly "intangible" habitat values is difficult or impossible is no longer valid (Horvath 1978; Dwyer 1977; Copeland 1976; Morrow 1979).

Specific data to analyze both the nonmonetary and monetary socioeconomic recreational, social, and cultural values of the Susitna River Basin are lacking. It should also be stressed that an adequate assessment of monetary values by traditional methods must be based on commercial,

recreational, and subsistence use data which are not currently available and not being collected. Designs for this data collection and the data collection itself would best be done by the Department of Fish and Game, the traditional collector of data on these users. Therefore, this Department would like to actively participate in planning those portions pertaining to socioeconomics, recreational, cultural and aesthetic values of the Susitna River Basin.

Administrative Overhead and Time Delays

Overhead costs have not been included in the attached budget. The Alaska Department of Fish and Game (ADF&G) normally charges overhead to cover costs incurred by its Division of Administration. On most outside contracts, this amounts to approximately 10 percent of all costs except equipment. However, overhead is usually not charged on reimbursable service agreements (RSA) between State agencies. Susitna Hydroelectric Project studies will place an additional burden on the Division of Administration particularly during the first year when major equipment purchases and personnel hiring will occur. However, this additional work load is not likely to cost 10 percent of the proposed budget (approximately \$600,000 during 1980 and 1981). Surplus money would presumably revert to the General Fund without accomplishing any purpose.

A more reasonable approach would be for the Division of Administration of the ADF&G, the Alaska Department of Administration, and the Alaska Power Authority to design a realistic program for administering the funds and to have APA reimburse the appropriate agencies for actual costs. These costs should be added to the overall budget.

The time normally required to process purchase requisitions and contracts is likely to create problems with APA's time table. A similar problem developed when the Legislature appropriated Bristol Bay disaster relief funds during 1974 after a failure in the salmon run. The problem was solved by funding a position in the Anchorage office of the Department of Administration to expedite purchasing. This allowed the rapid purchase of items without violating purchasing procedures and without excessively burdening the State's regular administrative staff. A similar approach would be beneficial to the Susitna Program. It is recommended that APA and Administration consider it as an option.

Monitoring & Surveillance

Monitoring and surveillance of Phase I and II project activities to minimize the impact of these activities on fish and wildlife and their habitats will be necessary.

The Susitna Hydro Coordinator will be responsible for assuring that the Department reviews and comments upon the host of State and Federal permit actions which may be required each year for land and water use.

He will be specifically responsible for ADF&G Title 16 permit applications review and development stipulations to protect fish and game.

Estuarine Studies

The Department of Fish and Game has not attempted to detail possible estuarine studies for the preliminary final POS. These studies can be delayed pending the outcome of Phase I studies.

If demonstrable hydrologic and water quality changes near the mouth of the Susitna River are shown or projected (based on the analysis of 1980 or 1981 data), estuarine studies should be initiated to identify the potential for project impacts on that environment.

AQUATIC STUDIES

Introduction

The Susitna River drainage, located north of Cook Inlet, encompasses an area of 19,400 square miles. The free-flowing Susitna River is approximately 275 miles long from its source in the Alaska Mountain Range to its point of discharge into Cook Inlet. The mainstem river and its major tributaries originate in glaciers and carry a heavy silt load during the ice-free months, but there are also many smaller tributaries which are perennially silt-free.

The construction of power dams on the Susitna River will adversely affect portions of the fish and wildlife resources of the Susitna River Basin. The two dam system proposed by the Corps of Engineers (COE) would inundate in excess of 50,500 acres of the Susitna River Basin aquatic and terrestrial habitat upstream of Devil Canyon. Regulation of the mainstem river will substantially alter the natural flow regime downstream. The transmission line corridor, substations, road corridor, and construction pad sites may also impact aquatic and terrestrial communities and their habitat. Historically, the long-and-short-term environmental impacts of hydroelectric dams have adversely altered the extremely delicate balance of ecosystems (Keller 1976; Hagan et al 1973).

Background knowledge of the Susitna River Basin is limited. The proposed hydroelectric development necessitates gaining a thorough knowledge of its natural characteristics and populations prior to final dam design approval and construction authorization in order to protect the aquatic and terrestrial populations from unnecessary losses. All engineering, hydrological, biological, and other project feasibility study activities conducted by the various governmental and private agencies will also have to be monitored and regulated to prevent ecological disturbances.

A survey of the fishery resources should cover complete life history cycles. A 30 month program prior to license application (Phase I), although supplying essential information about the fishery, is inadequate and should be continued through supplemental studies in Phase II. The proposed studies should be conducted for a minimum period of 5 years.

Five species of Pacific salmon (chinook, coho, chum, pink, and sockeye) inhabit the Susitna River drainage during their freshwater life history stages. The majority of chinook, coho, chum, and pink salmon production in Cook Inlet occurs within this drainage. An anadromous smelt, the eulachon, also utilizes the lower reaches of the river.

Cook Inlet is one of the major anadromous fish producing areas in the State of Alaska. The commercial catch of salmon reported for Cook Inlet during the five year period from 1971 to 1975 averaged over a million fish per year, and represented an average of 7.4 percent of the total catch for the State of Alaska. In addition to the commercial catch of

salmon, the recreational fishery took about 90,000 salmon a year and the personal-use fishery, an additional 10,000 salmon per year. Sockeye, pink, and chum salmon are by far the most important commercial species in the area, making up over 90 per cent of the total catch from Cook Inlet; coho and chinook salmon make up the remainder. Chinook and coho salmon also are the species most favored by the recreational fishermen.

Grayling, rainbow trout, Dolly Varden, burbot, lake trout, and whitefish are some of the important resident fish species common to this system. Approximately 50 percent of the statewide sport fishing effort occurs within the Cook Inlet area. The recreational marine fishery is, however, very limited with the exception of a popular fishery at the vicinity of Deep Creek on Cook Inlet. The majority of the anadromous sport fish harvest occurs as the fish approach their spawning areas. Most anglers within the Cook Inlet area show a preference for salmon rather than resident game fish when both types of fisheries are available. Resident populations are fished more heavily during fall and spring months during the absence of salmon runs.

Therefore, the proposed Susitna River hydroelectric project will have various impacts on both the indigenous organisms and the natural conditions within the aquatic environment. Potential impacts to fish populations are the most obvious source of concern due to their socioeconomic and recreational importance to the people of Alaska and the Nation.

STUDY PROPOSALS

Individual study proposals are designed to provide the necessary background information to enable proper evaluation of impacts. Six general objectives have been outlined:

1. Determine the relative abundance and distribution of adult anadromous fish populations within the drainage.
2. Determine the distribution and abundance of selected resident and juvenile anadromous fish populations.
3. Determine the spatial and seasonal habitat requirements of anadromous and resident fish species during each stage of their life histories.
4. Determine the economic, recreational, social, and aesthetic values of the existing resident and anadromous fish stocks and habitat.

The Department has not developed a specific work plan for this objective but strongly believes the Acres-American POS must be strengthened to cover fish and wildlife concerns during Phase I.

5. Determine the impact the Devil Canyon project will have on the aquatic ecosystems and any required mitigation prior to construction approval decision. This is the primary objective of both Phase I and II studies. This will be discussed in detail in the Phase II work when it is written.
6. Determine a long-term plan of study, if the project is authorized, to monitor the impacts during and after project completion. This is also an objective of Phase II.

The study areas are generally categorized within the following locations:

- A. Cook Inlet area
- B. Cook Inlet to the Yentna River confluence
- C. Yentna River to the Talkeetna River confluence
- D. Talkeetna River confluence to the Devils Canyon dam site
- E. Devil Canyon dam site to the Tyone River confluence
- F. Proposed transmission line corridor(s), access roads, and construction pad sites

Scaling of the proposed studies with respect to timing, geographic locations, and intensity has been done with consideration of the resource knowledge available for each of the geographic locations identified above.

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

OFFICE OF THE COMMISSIONER

ESTES ✓
JAY S. HAMMOND, GOVERNOR

X
P.O. BOX 3-2000
JUNEAU, ALASKA 99802
PHONE: 465-4100

April 28, 1982

Weltzin
NAF

Mr. Jeff Weltzin, Energy Coordinator
Northern Alaska Environmental Center
218 Driveway
Fairbanks, Alaska 99701

Dear Mr. Weltzin:

Thank you for your interest in the Alaska Department of Fish and Game's involvement in the Susitna Hydroelectric project. In response to your letter dated April 14, 1982, I will attempt to clarify for you my Department's position with regard to the division of labor between the various divisions.

First, as I understand the events of the teleconference you refer to, Director Logan's remarks resulted from a question by Representative Fanning to the effect that, if no additional funding is forthcoming for the Habitat Division, how would the Division do the necessary Su Hydro work? In my Department, when a project is proposed, whether it be a mining, road or port harbor project, the Habitat Division solicits comments and evaluations of the projects probable impacts on fish and wildlife resources from the management divisions before issuing a permit or commenting to the proponent. In this light, the Susitna Project is no different than other projects. I will admit that this project has elicited a large volume of reports, all of which will need to be reviewed.

To answer your specific questions, I have initiated a specific intradepartmental team chaired by Deputy Commissioner Collinsworth to review the feasibility report and provide me guidance on mitigation options. The Team will be made of members of the Fisheries Divisions (FRED, Sport Fish and Commercial Fish) and the Game Division. The Habitat Division, with direction from this Team, will then be able to respond to the requirements of Title 16.

As with most Departments of this type, adequate funding is usually not available to respond to all projects and it is essential, therefore, that we continue to carefully rank our workload. I expect that in so doing, we will give the Susitna Project appropriate emphasis. The adequacy of our staffing and funding will be determined to a significant degree by the FY 83 general fund budget.

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

OFFICE OF THE COMMISSIONER

ESTES ✓
JAY S. HAMMOND, GOVERNOR

X
P.O. BOX 3-2000
JUNEAU, ALASKA 99802
PHONE: 465-4100

April 28, 1982

Mr. Jeff Weltzin, Energy Coordinator
Northern Alaska Environmental Center
218 Driveway
Fairbanks, Alaska 99701

Dear Mr. Weltzin:

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Jeff Weltzin

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April 28, 1982

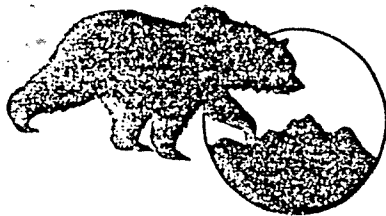
I hope that this has adequately addressed your concerns.

Sincerely,

A handwritten signature in cursive script, appearing to read "Ronald O. Skoog", with a long horizontal flourish extending to the right.

Ronald O. Skoog
Commissioner

cc: Don Collinsworth
Richard Logan



Estes ✓
Northern Alaska Environmental Center

218 DRIVEWAY
FAIRBANKS, ALASKA 99701
(907) 452-5021

U

June 4, 1982

Commissioner Ronald O. Skoog
Alaska Department of Fish and Game
P.O. Box 3-2000
Juneau, Alaska 99802

Dear Commissioner Skoog,

As you know, my organization has worked with others to support a \$200,000 appropriation through the Legislature to study the potential of upper Susitna River salmon enhancement. I wish to thank you and your staff for the helpful background information describing how ADF&G would approach this study.

We based our decision to pursue this funding for the ADF&G on your letter of March 20, 1981 which stated that the present arrangement between your agency and the APA would not include any assessment of upper Susitna River salmon enhancement potential. More specifically, our motivations in supporting this funding are outlined in the following questions that hopefully this study will answer:

1. Can the Devils Canyon hydraulic barriers to the migration of the five species of salmon (chinook, coho, chum, sockeye and pink) be altered or bypassed to permit the passage of these species to both tributaries and connecting lakes above Devils Canyon in absence of the proposed Susitna hydro project?
2. If fish passage through Devils Canyon is feasible, what would the potential benefit of salmon production from the tributaries and lakes upstream of Devils Canyon be to the sport, commercial and subsistence fishermen?
3. What would the biological impacts be to other species presently residing in the upper Susitna?
4. If the Susitna dams are built, how would this effect the potential of upper Susitna River salmon enhancement?

It is our hope that this baseline study can be integrated into the ADF&G's Susitna hydro investigations to obtain the maximum understanding of the feasibility of providing access to and from the habitat of the upper Susitna. We believe that this knowledge is absolutely essential to determining whether the instream flows of the upper Susitna are best suited for fishery enhancement or hydro development or both.

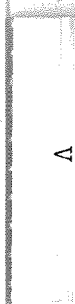
In conclusion, the results of the first phase of the Susitna studies show that if the proposed Susitna dams have benefits, they are over a fifty year or longer period. It is our belief that the benefits of the potential salmon enhancement of the upper Susitna should also be examined in the same context. Just as the Railbelt will experience

increased demand for electricity over the long term, the Railbelt could equally experience increased demand for Susitna salmon. Both potential developments of the Susitna must be understood to allow Alaskans the ability to make an informed decision on what are the best uses of the Susitna River.

In anticipation that the Governor will not veto this appropriation, I would be pleased to meet with you to discuss this appropriation in more detail if you so desire. I would also appreciate being informed on how you intend to implement this study and its progress as it evolves.

Sincerely,

Jeff Weltzin



MEMORANDUM

V V *Estes*
State of Alaska *XL*

TO: John Stewart
Deputy Director
ADF&G - Division of Administrative
Juneau

DATE: July 20, 1982

FILE NO: 02-82-13.03

TELEPHONE NO: 274-7583

FROM: Tom Trent *TST*
Su Hydro Aquatic Studies Coordinator
ADF&G - Su Hydro Aquatic Studies
Anchorage

SUBJECT: ADF&G Su Hydro -
RSA's and Program
Documentation.

Per our telephone conversation of July 20, I have sent to you five enclosures relevant to our program scope and budgeting for the Su Hydro Aquatic Studies.

I hope this information is of use to you in any discussions you may have with staff of the Legislative Budget and Audit Committee.

Please contact me if you require any more information or documentation.

cc: R. Logan/L. Bondirola

*A bridged
version
(minus attachments (enclosures))*

Doug -

FYI.

Allen B.

Enclosure I

July 20, 1982

The November 1979 Preliminary Final Plan of Study for Fish and Wildlife Studies formed a base for subsequent negotiations with the Alaska Power Authority (APA) and Acres American Incorporated (Acres), the prime feasibility study contractor, on the study program needed to fill the informational and data requirements of the Federal Energy Regulatory Commission (FERC) for a Susitna Hydroelectric Project license application.

This document also lined out many mandates, issues, constraints and recommendations regarding the studies and the need for them. Please note our commentary on pages 7 and 8 regarding Phase I Studies Initiation.

Negotiations with APA and Acres continued through to April and May 1980 and the Plan of Study (POS) on June 2, 1980 formed the conceptual base and established the funding level for the FY 81 RSA's of the Sport Fish and Commercial Fish Divisions.

Enclosure II

July 20, 1982

The June 2, 1980 memo from me to Robert Mohn of APA transmitted the basic program and agreement statement attached to our FY 81 RSA. A total of 506.7 K was allocated to Sport Fish Division (SF) and 210.5 K to Commercial Fish Division (CF) for FY 81. RSA cover sheets dated in the 6/80 period are attached to this document for your information.

In July and August of 1980 the APA and Acres approached the Department about accelerating certain SF field programs and another RSA for accelerated field program was cut in the amount of 218.0 K.

Implementation of the studies, as we pointed out to APA at that time, was contingent upon the classification of Su Hydro positions and receipt of PCN's. These PCN's were not available until October 1980 and we opened the Aquatic Studies office on October 25, 1980.

The accelerated studies RSA amendment 2 is attached. The amount of 218.0 K for this amendment was for accelerated work as indicated previously, and the 74.5 K was an amount from a cancelled Habitat Protection Section RSA (attached) with APA for functions to be assumed by SF Division. This amendment amounted to 292.5 K which added to the other SF-RSA totaled 799.2 K for the FY 81 SF portion of the program.

Enclosure III

July 20, 1982

After being selected for the position of Su Hydro Aquatic Studies Coordinator in October 1980, I began recruitment for Su Hydro Aquatic Studies Staff. I also began a review of our program funding and program direction to evaluate adjustments that would need to be done due to the four months lapse in program implementation because PCN's and hence staff were not available for the project. Following discussions from December through to April 3, 1981 with Acres American and APA our FY 81 SF-RSA's were reduced from a total of 799.2 K to 599.1 K (shown in amendment 3 attached). Amendments 3 and 5 budget figures result of APA and headquarters attempt to reconcile the confusion of the two SF-RSA's by which we were being funded. I don't know all the details on this reconciliation into one set of figures since the original agreement versus all previous amendments budget figures were arrived at by Juneau headquarters and APA's Internal Auditor.

The Commercial Fish Division RSA amendment for FY 81 as a result of our program and budget review was changed from 210.5 K to 247.0 K.

Documentation of our negotiations or review resulting in these amendments are memos from me to David Wozniak of APA dated March 4, 1981, April 2, 1981 and April 3, 1981 (attached).

Enclosure IV

July 20, 1982

In October 1981, we initiated discussions with APA to provide Phase II funding after January 1, 1982 for the Su Hydro Aquatic Studies. Only partial funding for the project after that date had been provided earlier by APA. The unfunded program activities were basically for field activities. We conducted a program and budget review and subsequently funding for FY 81 was established at 623.5 K for CF and SF at 1,185.6 K on a total basis. This brought RSA totals from July 1, 1980 to 870.5 K for CF (RSA-SF Amendment 4 attached and 1,784.6 K for SF (RSA Amendment 6 attached). Documentation on program and revisions occurring for these amendments is shown in memorandum from myself to Dave Wozniak of APA dated November 6 and November 9, 1981 and February 16, 1982.

Enclosure V

July 20, 1982

During March and April of 1982 ADF&G provided proposed plans of study to APA and Acres American for the FY 83 Aquatic Studies Program. The June 8, 1982 submission attached outlines the program concept and budget agreed upon for the FY 83 field season after the review APA completed by May 27, 1982. This program statement is for both the SF and CF portions of the Aquatic Studies.

The RSA amendments No. 7 for SF and No. 5 for CF for FY 83 are also attached.

ESTES ✓

JAY S. HAMMOND, GOVERNOR

DEPARTMENT OF FISH AND GAME

OFFICE OF THE COMMISSIONER

P.O. BOX 3-2000
JUNEAU, ALASKA 99802
PHONE: 465-4100

October 20, 1982

Mr. Jeff Weltzin
Energy Volunteer
Northern Alaska Environmental Center
218 Driveway
Fairbanks, Alaska 99701

Dear Mr. Weltzin:

Your letter dated August 27, 1982, concerning several questions of the adequacy and completeness of the Federal Energy Regulatory Commission license application which the Alaska Power Authority will submit in February 1983 did not arrive in my office until September 21. Your letter was postmarked September 17. In any case, I regret the delayed response.

Our comments to the questions outlined in your letter are as follows:

1. Is the Department's five-year study requirement still necessary in light of the APA's FERC license application time frame?

Yes, in this Department's opinion the minimum five year time frame for the Su-Hydro fisheries study continues to be necessary for reasonably defining potential fisheries impacts and approaches toward mitigation. We must emphasize, however, that the actual time-frame requirements may be modified in succeeding years for certain study segments. For example, some fisheries-impact-related issues may be adequately covered in less than five years, while others may extend beyond that period. It is also likely that studies evaluating proposed mitigation alternatives and testing of their feasibility will be initiated in the next year or two. Among them will be those ADF&G baseline fisheries studies which have evolved into mitigation studies once a better understanding of potential project impacts is attained.

This year the Department will initiate an analysis of pre-project conditions while the Arctic Environmental Information and Data Center (AEIDC) will address post-project aquatic habitat conditions. These studies also will provide a basis for reevaluating the scope of work and time required to complete the various field data collection

components, which will be necessary to describe project impacts. This information will be presented in the spring of 1983.

2. Similarly, how many more years of study does ADF&G need to fulfill your statutory mandates?

We do not believe your question can be answered in terms of the quantity of data collected through time. Instead it must be viewed on the basis of its quality and ability to provide a factual basis for assessing project impacts on fisheries and aquatic habitats. Again, we expect this to be a pivotal year which we hope to have the data to suggest where, when, and how factual impact conclusions can be made. This Department does not intend that fisheries studies be an interminable process. At the same time it would be inappropriate to second guess the full time frame required by presently identified studies. Following APA's license application to FERC, the additional input of the natural resource agencies to the FERC review process may give considerable guidance to the assessment of impacts on fisheries and aquatic habitats and the adequacy of the submitted mitigation planning and data base. I also refer you to correspondence from my office to you of March 12, 1982.

3. Do the APA's plans of FERC license application submittal in early 1983 allow adequate time for fishery information collected during FY 83 to be included in the proposed application?

No. Analysis and interpretation of information collected by the ADF&G during 1982 will not be finalized until June 30, 1983, in accordance with the report schedule agreed upon between ADF&G and APA (enclosed). Both APA and Acres American (Acres), the APA's prime feasibility study contractor, have noted that the analyses of pre- and post-project conditions which will be performed by the ADF&G and AEIDC in the spring 1983 will be a time consuming and complex process. Furthermore, it has been expressly recognized by APA and Acres that these analyses would not be driven by the February 1983 FERC application deadline. Some provisional data reduction of the 1982 ADF&G fisheries data, however, will be made available to Woodward-Clyde Consultants who are drafting the Exhibit E fisheries portion of the license application and the fisheries mitigation plan. These will be limited to provisional escapement and thermograph data.

It is our understanding that FERC has the option of accepting the license application upon demonstration by APA that

Mr. Jeff Weltzin

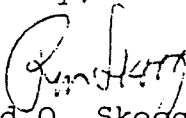
-3-

October 20, 1982

amendment or supplementary data and their analyses are clearly in the process of collection or completion for submittal at a later date. Use of this option by FERC might be based upon formal resource agency recommendations and comments during the FERC license application review process. I also refer you to my comments of April 16, 1982, to the APA on the feasibility of this project.

Thank you again for your continued interest in these questions. Please do not hesitate to contact us again if you have further concerns.

Sincerely,



Ronald O. Skoog
Commissioner

cc: Richard Logan
Steve Pennoyer
Stan Moberly

Enclosure

The following discussion outlines the reporting and planning reports and events the ADF&G intend to follow during FY83. Also included are reports based on the proposed reporting schedule of Woodward-Clyde and the Arctic Environmental Information and Data Center (AEIDC). The information presented is to give a perspective of planning and reporting events related to the ADF&G Su Hydro Aquatic Studies. Some preliminary conceptual detail of our reports is also presented based on preliminary discussions with AEIDC regarding our interfacing role in the analysis and interpretation of pre and post project conditions.

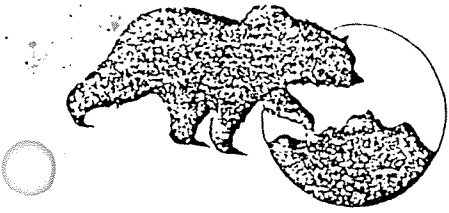
The schedule of planning and reporting events is as follows:

- | | |
|-------------------|--|
| July 15, 1982 | <u>ADF&G</u> Draft Procedures Manual FY 83 Field Programs. This is a basic internal ADF&G planning and field guidance document. |
| July 31, 1982 | <u>Woodward-Clyde (Proposed)</u> Draft Mitigation Outline |
| November 30, 1982 | <u>AEIDC (Proposed)</u> , Internal Working Document, conceptualizing and visualizing project impacts on a non-quantitative basis. |
| January 31, 1983 | <u>ADF&G</u> , Draft Basic Data Report. This is an internal working document and also provides for data transmittal to AEIDC and Woodward-Clyde and others as appropriate. It basically presents what the data is, how and where it was collected. The report would include winter 81/82 data and data for the ice free season from May thru October 1982. This report does not include habitat versus fisheries relationship information. |
| January 31, 1983 | <u>Woodward-Clyde (Proposed)</u> , Draft Exhibit E. |

March 1, 1983	<u>ADF&G</u> , FY 84 Draft Plan of Study (POS)
April 1, 1983	<u>APA-ADF&G</u> , FY 84 RSA and POS Agreement. Contingent on approval of funding by the Legislature..
April 15, 1983	<u>ADF&G</u> , Revised Draft Basic Data Report
May 1, 1983	<u>ADF&G</u> , Draft Fisheries and Habitat Relationships Report. An internal working document which functions as a data/information transmittal to AEIDC and other study participants.
June 1, 1983	<u>ADF&G</u> , FY 84 Procedures Manual.
June 30, 1983	<u>ADF&G</u> , Final Draft Fisheries and Habitat Relationship Report. This is a formal document available for broad distribution by the APA to study participants, agencies and the public.
June 30, 1983	<u>ADF&G</u> , Draft Basic Data Report. This would cover winter 82/83 work and include incubation study data. This is an internal working document and data transmittal to study participants.
October 30, 1983	<u>AEIDC Proposed</u> , Draft Impact Assessment Report

F. Procedures Manual

(The Alaska Department of Fish and Game will provide an annual
update of the aquatic studies procedure manual by June 1 of each
project year.)



Northern Alaska Environmental Center

218 DRIVEWAY
FAIRBANKS, ALASKA 99701
(907) 452 5021

August 27, 1982

COMMISSIONER'S OFFICE

RECEIVED
SEP 21 1982

Commissioner Skoog
P.O. Box 3-2000
Juneau, AK 99802

DEPARTMENT OF FISH AND GAME

Dear Commissioner Skoog:

The Alaska Power Authority Board of Directors has decided to submit an application license to construct the proposed hydroelectric dams on the Susitna River to the Federal Energy and Regulatory Commission (FERC) sometime during the first quarter of 1983. As you know, the adequacy and completeness of a FERC license application are critical variables in any forthcoming FERC deliberations and also serve an important role in the decision as to whether the proposed dams are the best use of the Susitna.

With the APA's current plans of an early 1983 FERC license application submittal, important issues are raised concerning the effect of their actions on ADF&G's stated five year study requirement:

1. Is the Department's five year fishery study requirement still necessary in light of the APA's FERC license application timeframe?
2. Similarly, how many more years of study does ADF&G need to fulfill your statutory mandates?
3. Do the APA's plans of FERC license application submittal in early 1983 allow adequate time for fishery information collected during FY 83 to be included in the proposed application?

Your timely responses to these issues will be of great importance in informing the Alaskan public of the complex considerations required to make an informed decision on the proposed Susitna dams. Thank you.

Sincerely,

Jeff Weltzin
Jeff Weltzin
Energy Volunteer

CC: S. Moberly
E. Logan
S. Pennoyer
FERC
Governor Hammond



STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

Bingham
Estes
JAY S. HAMMOND, GOVERNOR

2207 Spenard Road
Anchorage, Alaska
99503

~~XXXXXXXXXXXX~~
~~ANCHORAGE ALASKA 99503~~

November 19, 1981

02-81-7.10

Mr. Russell J. Nemechek
Terrestrial Environmental Specialists
R.D. 1, Box 388
Phoenix, New York 13135

Dear Russ:

I am still uncomfortable with the attempt to define specific mitigation options based on the currently available data. This is because currently available data does not sufficiently chart potential impacts, the first step in defining the need for mitigation.

At our last meeting it was suggested that a "laundry" list of mitigation options be prepared for our information. Once we have determined if impacts will occur then we could go through the list of options to discuss those which may be viable.

Also, in my opinion, we still have not written off the feasibility of avoiding or minimizing impacts by providing adequate flows for fish habitats in my opinion. We should not be too hasty to look at out-of-kind engineering solutions which are basically compensatory mitigation for lost habitats. As I have indicated before, the Department's draft mitigation policy and to an extent the USFWS mitigation policy, prioritize implementation of the various mitigation options. Compensation is the last priority option for consideration and I believe the fish and wildlife agencies in reviewing mitigation plans will seek proof that the avoidance, minimization, and other options have been adequately considered in dam design and operation by the Alaska Power Authority and Acres American Inc.

At this time, I prefer to wait for completion of the Su Hydro species/subject reports and a review of the substance of these reports and further information on flows, temperature etc., provided by Acres. Then we will describe what ADF&G-Su Hydro believes the impacts of the project on fish in the Talkeetna to Devil Canyon reach and the impoundment area will be.

I suggest that TES develop the list of mitigation options and alternative and references on their success or failure on other projects. I presently don't have time to review or develop the information on these options and feel my time is best spent in working on the completion of our

November 19, 1981

reports which will be most valuable in assessment of project impacts. Until these reports are done, however, I will attend mitigation technical group meetings to keep apprised of the information coming from other sources which is important to the evaluation of impacts.

Sincerely,



Thomas W. Trent
Aquatic Studies Coordinator
Su Hydro Aquatic Studies
Telephone: (907) 274-7583

cc: M. Bell
C. Atchinson
W. Trihey
R. Williams
K. Young
D. Schmidt

*these were
all consultations at
that time*

Dana later came

to ADF+G

to replace

K. Delaney

RJ Pay

Leader

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

OFFICE OF THE COMMISSIONER

ESTES
Bill Sheffield, Governor

P.O. Box 3-2000
Juneau, AK 99802
Phone: 465-4100

January 13, 1983

Alaska Power Authority
334 West Fifth Avenue
Anchorage, Alaska 99501

Attention: Eric Yould, Executive Director

Gentlemen:

Re: Review Comments - Draft Exhibit E - Susitna Hydroelectric Project

The Alaska Department of Fish and Game (ADF&G) has reviewed the Draft Exhibit E, dated November 15, 1982, that was prepared for inclusion in the license application for the Susitna Hydroelectric Project that the Alaska Power Authority (APA) intends to submit to the Federal Energy Regulatory Commission (FERC).

The Department's review of the Draft is based on the adequacy with which the fish and wildlife resources affected by the project, the impacts to those resources attributable to the project, and specific mitigation proposals to offset impacts are identified and quantified.

The types of information required for an adequate assessment of feasibility, with respect to fish and wildlife resources were originally identified for the APA in November 1979 through correspondence relative to the Plan of Study and were most recently identified in Commissioner Ronald Skoog's statement to the APA Board of Directors on 16 April, 1982.

Our review comments on the following chapters are appended to this letter:

- Appendix A - Chapter 2 - Water Use and Quality;
- Appendix B - Chapter 3 - Fish, Wildlife and Botanical Resources;
- Appendix C - Chapter 5 - Socioeconomic Impacts;
- Appendix D - Chapter 7 - Recreational Resources; and
- Appendix E - Chapter 9 - Land Use.

The time afforded the ADF&G to review the Draft Exhibit E has not been sufficient to allow a detailed review of all the chapters, nor has it

enabled us to present our comments in as thorough and refined a manner as we would have liked. We do, however, expect to take advantage of future review opportunities to further address these issues.

The appended reviews (Appendices A-E) contain general statements regarding the overall adequacy of each chapter. Following these are specific comments addressing the technical content of the report. In the specific comment section, we have on occasion clarified the Department's policies and positions with respect to the proposed Susitna Hydroelectric project.

Throughout the chapters of the Draft Exhibit E that we reviewed, both the information presented and the assessment of impacts are generally insufficient for the kind of a planning and source document needed for preparation of an EIS. We are concerned that the benefits and cost aspects of the project have not been presented completely and clearly. The general problems with the Draft Exhibit E chapters that were reviewed by the ADF&G are as follows:

1. Data and information contained in the Exhibit E are, in many cases, incomplete or not properly interpreted.
2. Many potential impacts and issues attributed to the Susitna Hydroelectric Project are not addressed. Impacts to fish and wildlife resources and users that are addressed are not adequately quantified and proposals to mitigate impacts are not sufficiently developed.
3. Not all source materials, other Draft Exhibit E chapters, or the results of other study disciplines that are pertinent to the project are referenced.
4. Throughout the document there is a failure to discriminate between fact and speculation.

Our comments, recommendations, and suggestions to strengthen the material contained in Draft Exhibit E in relation to the problem areas identified above are as follows:

1. The APA should examine the specific comments appended to this letter and clarify or expand sections in the Draft Exhibit E chapters where inadequate treatment of the data or information is suggested. The suggestion here is that while some interpretations by the authors are not necessarily inaccurate, they are incomplete. This type of problem in the Draft Exhibit E may be either editorial or a function of the short time frame allotted to assemble, assess and analyze the information available. The Draft Exhibit E chapters should utilize currently available and relevant information and data sources.

2. The Draft Exhibit E chapters should accurately reflect the current state of resource knowledge and information on impacts which are understood and those which are still undetermined. Consequently, the mitigation plans cannot be considered adequate unless the information and analysis of impacts is current and comprehensive. The mitigation plans should clearly indicate how impacts are considered in the design of the project; what measures will be taken to avoid, minimize or rectify impacts; and how effective these measures will be in mitigating losses.
3. Source material in the Draft Exhibit E is not adequately referenced. Furthermore, data and information reported in chapters of the document should be consistent with other chapters. The lack of coordination between the resource groups and the engineering and construction groups is evident; conflicts have not been clearly identified between uses and disciplines. To remedy this deficiency all conflicts between engineering and economic factors and environmental alternatives should be identified and the consequences of altering those factors should be listed. The environmental concerns should be weighed equally with engineering and economic constraints.
4. Throughout the document, there is not always adequate discrimination between fact and speculation about resource values, concerns, issues, impacts and mitigation alternatives.

In some cases adequate referencing and reporting of data in the chapters may resolve this. Where baseline data collection is required to remove speculation it should be done, or if relevant data and information are available elsewhere they should be collected and evaluated.

The Department of Fish and Game recognizes the general character of the above recommendations. These recommendations are made based on an overview of the ADF&G comments for the chapters we have examined. We invite further consultation by the APA with our agency to discuss the specifics of the chapters we reviewed and our general recommendations.

The fish and wildlife resources of the Susitna River Basin are of high value. Construction and operation of the proposed Susitna Hydroelectric Project can have wide ranging implications for these resources and their users. It is the objective of this Department to help Governor Sheffield insure that fish and wildlife resources are considered along with other project features during all stages of project planning, construction and operation.

Based on the above overview of the Draft Exhibit E and the chapter-specific comments contained in the enclosed Appendices, the ADF&G does not believe that this planning document is sufficiently complete. Furthermore, we believe that the APA can best insure expeditious review and approval by FERC if it does as much as possible

January 13, 1983

to resolve agency concerns or establishes the mechanism to resolve those concerns.

We hope our review assists the APA in addressing the concerns expressed herein and consider that this review represents only part of the process needed to reach the objective we wish to attain. It is highly important from our perspective that the FERC License Application scheduled for submission in February and the process of consideration of the Exhibit E will positively contribute to the equitable consideration of fish and wildlife concerns.

Thank you for the opportunity to review and comment on this document. We would appreciate your providing an explanation of how you eventually respond to the comments we have made.

Sincerely,



Don W. Collinsworth
Acting Commissioner

Enclosures

cc w/enclosures: Lennie Boston, Special Assistant to the Governor

APA Board Members:

John Schaeffer

Charles Conway

Robert Weeden

Daniel A. Casey, Commissioner,

Department of Transportation and Public Facilities

Richard A. Lyon, Commissioner,

Department of Commerce and Economic Development

Richard A. Neve, Commissioner,

Department of Environmental Conservation

Peter McDowell, Office of Management and Budget

John Hayden, Acres American

Mark Robinson, FERC, Washington D.C.

APPENDIX A

Susitna Hydroelectric Project, Draft Exhibit E

Volume 1, Chapter 2

Water use and quality

GENERAL COMMENTS

This document generally fails to cite supporting evidence for the statements made or for potential impacts considered to be of major importance to this agency. An example can be found in the discussion of ice processes in the lower river. The ice formation processes are simply stated as causing staging of 4 feet at Talkeetna to 3 feet at Sherman (E-2-59). The method used to determine this estimate has not been defined. Also, no references have been provided that evaluate whether ice processes are or are not a problem below other hydro projects. If this is a purely speculative scenario, it should be so noted. Otherwise, a scenario assuming that the staging would be 6 to 8 feet at Talkeetna during the winter months and annual floods would occur is just as supportable as the statements provided.

The failure to provide a separation of the speculative comments from the segments of the text supported by documentation creates severe problems in assessing the overall credibility of the report.

This document also needs a preface on how the flow scenario and access route were selected for the license submittal and a discussion of other available options. The Exhibit A document referenced on page E-2-86 on access routes was not provided for our review.

SPECIFIC COMMENTS

The following comments are addressed to page specific areas and paragraphs and primarily address general deficiencies rather than grammatical errors.

Page/Paragraph

E-2-3/4

The source of the 40 percent stream flow statistic should be identified.

E-2-3/5

State that all the flows listed other than upper Susitna River are also mean annual flows.

E-2-4/1-4

References are needed to support the flood information discussed.

E-2-5/1

References are needed to support the statement that the shape of the listed duration curves is indicative of flow from northern glacial rivers.

E-2-5/3

Reference(s) are required to support the discussion regarding Susitna River morphology.

E-2-10/1

The description of sloughs as having a steeper gradient than the mainstem is misleading. The gradient within the sloughs is generally variable, with a steep upper section and a lesser slope in the lower end. In upland sloughs, those without scour channels, the gradient appears to be even less. Overall, the sloughs have a steeper gradient, but the variability of their gradient is important to their fisheries production.

E-2-11/2

There is a need to cite specific references in the water quality text even though a general reference section was provided in the preface for the water quality section.

E-2-12/3 & 4

The months that are included in the "winter, spring and summer" time frames need to be identified.

E-2-12/5

Clarification needs to be provided as to whether the Gold Creek temperature data presented in Fig. E-2-30 were correct. The location of this station was determined to be influenced by Gold Creek flows in 1981 and the station location was changed in 1982 to the northwest bank as a consequence.

E-2-14/1

A reference is needed for the Portage Creek temperature data.

E-2-14/3

It should be noted here that under natural conditions, staging during freezeup reportedly causes flooding of portions of the town of Talkeetna near the downtown airport. There is a need to reference the material presented in this paragraph.

E-2-14/5 & 6

The term frazil ice should be defined for the readers. Also it cannot be overstated that ice jams could have severe consequences to portions of the community of Talkeetna.

E-2-17/5

In order to properly assess the effects of the project on the downstream fisheries and fisheries potentials of the impoundments, a relationship of suspended sediment and associated particle size to vertical illumination is desirable. This does not appear to have been done, in that no quantitative measurements of vertical illumination have been obtained.

E-2-20/5

The dissolved gas concentrations above the Devil Creek rapids were not supersaturated and were recorded as approximately 100 percent. The 105 percent value was recorded above the Devil Canyon dam site.

E-2-24/2

These sloughs also contain important anadromous and resident fish rearing habitat.

E-2-25/5

Power generation could be considered an instream flow use under only unusual circumstances. In the case of reservoirs which store water for later power generation, the storage of water is definitely an out of

stream use. Using the terminology of "in-stream flow" in the context presented here for power generation is inappropriate and inaccurate.

E-2-26/3

Fry emergence occurs at different times within and among species.

Emergence is most closely correlated with accumulated thermal units and has little to do with the hydrograph. Also burbot and Dolly Varden should be added to the list of important resident species.

E-2-28/6 & E-2-29/1

Seasonal salinity measurements should be collected and correlated to a wide range of flow levels and tide conditions instead of to a few selected flow levels.

E-2-29/2

The location of the sampling site and a definition of the mouth of the Susitna River should be provided to give credence to this statement. Saltwater intrusion would be expected to be dependent upon tidal action so this must also be taken into account when describing saltwater mixing and intrusion.

E-2-29/4-5

The use of regression equations to calculate the peak and low flows without data on actual discharge of the tributary streams to be crossed by the access road is inappropriate and should not be used as a substitute for collection of discharge information. This is particularly important to the design of bridges or culverts for engineering integrity or for fish passage. The sizes of many drainage structures placed in the North Slope haul road and pipeline workpad were underestimated when these methods were applied. This resulted in hydraulic erosion and structure failures that were unnecessary.

E-2-29/6

It is stated that "The line between the dam and the intertie has yet to designed, sited or constructed." The Exhibit E should include information on the siting (corridors) of the transmission lines, baseline information on resources which may be impacted, an assessment of the impacts, and the methods proposed to offset impacts.

E-2-30/1-5

Discharge measurements should be collected at any stream crossings associated with the transmission lines if road access is to be developed. These measurements should be used in determining the size of bridges or culverts for fish passage and engineering integrity. If

any other transmission line routes were considered they should be listed.

E-2-31/General Comment on Section 3, PROJECT IMPACT ON WATER QUALITY AND QUANTITY.

It is essential to present a discussion of the rationale and process for selecting the operational schemes on which the impact discussions were based. In other words, it needs to be made clear why this specific operational scheme was selected above other alternatives, what the engineering rationale is and how considerations of environmental values, concerns or needs were incorporated into the judgement that this is a satisfactory operational scheme.

E-2-32/1

The statement that dewatering a 1-mile section of the Susitna River will not result in any serious impacts is incorrect. This area is used by grayling for wintering, and dewatering will result in a permanent barrier to migrating fish in the system. Data collected by the ADF&G in 1981 on intrasystem movements of grayling between Deadman and Tsusena Creek indicated migration between these systems.

E-2-33/4

The statement does not address the large amount of spoil that will be generated and the large amount of grading and washing that will be necessary to obtain proper sized materials for the construction of the dam. This will generate an enormous water quality and spoil disposal problem that has not been addressed. Spoil disposal sites should be located in a manner to preclude introduction of sediments into the Susitna River and fish-bearing tributaries.

E-2-34/4

Petroleum and petroleum product spills in the smaller grayling streams can have significant impacts on these fisheries. An oil spill contingency plan is essential to provide proper direction to prevent or mitigate spill events.

E-2-34/5

The description of the treatment of the waste water is totally inadequate. The discussion of waste water treatment should describe the volume of the waste water, the nature of the contaminant, a documented system for appropriate water treatment, the anticipated quality and the volume of the effluent, and an analysis of the instream concentrations of the effluent.

E-2-35/1

Groundwater can be impacted by polluted surface water drained into a well.

E-2-35/2

The term minor impacts, to describe the effects of excavation of borrow material, appears to be a mis-statement. If borrow material is taken from streams or lakes in the impoundment area, the impacts could have serious consequences on these fish populations. The types and volume of borrow materials to be removed, and the availability of materials need to be identified. An inventory of the fisheries in these areas needs to be made and baseline water quality conditions need to be documented. An analysis of the effects of borrow removal and mitigative actions to reduce the impacts by altering site locations or construction and operation techniques should be presented. This is a major oversight in this document.

E-2-35/5

Structural measures to prevent downstream movement of fishes through the tunnels is a necessary mitigative action that is not addressed. Downstream movement of fish without passage upstream essentially means these fish are lost to the population.

E-2-35/6

Upstream migration of fishes will be completely blocked by the velocity barrier in the diversion gates.

E-2-36/5

As with earlier comments (E-2-29/4-5), the regression analysis of peak and minimum discharges should not be substituted for the collection of discharge information.

E-2-37/3

The level of analysis presented here and detail of mitigation of the effluent should be provided for all effluents related to the project, not just sewage.

E-2-38/6

Reference to this information as a personal communication is inappropriate. The outmigration of salmon in the spring is as likely related to photoperiod and development as the other factors listed. Very low flows in the spring could cause many of the juveniles to remain trapped in backwater pools that are normally flooded by the mainstem under pre-project conditions.

E-2-39/2

The proposed flows of 12,000 cfs have not been demonstrated to maintain the character of sloughs and provide the flushing flows needed to clean fines out of the gravel. Also the cycle of vegetation succession will be altered if flows do not wash away old vegetative growth.

Consequently, what is now aquatic habitat may become terrestrial habitat over time.

E-2-39/3

Minimum flows for the winter period should be established according to fishery resource requirements. This is a critical period for the populations of overwintering fish and even minor dewatering may have significant deleterious effects.

E-2-39/5 & E-2-40

There needs to be an analysis of longer filling periods and associated consequences. The short filling period evaluated (3 years) may produce unacceptable consequences to fisheries resources. An extended schedule for filling may provide for a higher and more preferable mitigation option for fisheries through the 3-year schedule.

E-2-42/5

The potential negative impacts to slough areas downstream from Talkeetna resulting from decreasing the recurrence intervals of what are now mean annual bank full floods is not addressed.

E-2-43/2-5

The timing and the consequences of the thermal regimes created within the reservoir during filling to downstream water temperatures must be better defined.

E-2-43/5

The water temperatures downstream from Watana need to be defined more accurately. The cause of these low temperatures should be identified.

E-2-44/4

What are the predicted depths at which photosynthesis will occur and how will the quality of water discharged downstream compare with the preproject conditions with regard to photosynthetic processes? Data or discussion regarding this question should be presented.

E-2-45/3

The method used to estimate the 30-50 NTU values should be defined and better described. The reasons why winter turbidity levels are neither quantifiable nor subject to estimation should be clarified.

E-2-47/6

The section regarding impacts to slough habitats is not adequately presented. Basically, the relationship of mainstem discharge to slough discharge should be illustrated graphically. The response of the ground water wells to changes in the mainstem at the various locations (for those wells that were not silted in) should be plotted; a gradient profile of the groundwater, rather than just the thalweg of the slough, should be illustrated; and a map of the locations of upwelling in the sloughs should be presented. The text as written does not present data and many speculative comments are provided without appropriate qualifications.

E-2-49/2

The statements suggesting that there will be no changes in the temperature of upwelling groundwater and consequently, no impacts to incubating salmon eggs are not supported by data or citation. The reduction of flows through these sloughs is not quantitatively defined and could easily be major as well as minor. The loss of scouring flows that remove sediment in these sloughs as well as beaver dams, and

removal of spring ice buildups could easily cause a senesence process to begin which may ultimately destroy the sloughs is not addressed.

E-2-49/4-5

There are no citations, references or data to support these statements.

E-2-50/1

There is no reference to the commercial boat launch at Sunshine located immediately below the Parks Highway bridge on the east bank nor is there acknowledgement of the boat launch at the Talkeetna Village airstrip which is becoming more heavily used due to bank degradation and channel erosion at the "new" Talkeetna boat landing. If the mainstream of the Chulitna River moves west from its present position as defined in the Draft Exhibit E (E-2-42/4), access to the Chulitna River and Susitna River north of Talkeetna River confluence could be considerably more difficult than at present. The source of the data, analysis or other documentation to support the comment that minor restriction on upstream access to Alexander Slough may occur during years of low stream flow needs to be provided.

E-2-51/1

Downstream flow requirements have not yet been determined or agreed upon.

E-2-51/2

The criteria used to develop the 5,000 cfs minimum flow as well as any of the other "target" flows should be presented. There must be some documentation of the rationale, review or selection process by which these "target flows" were developed and justified.

E-2-52/1

Optimally operated reservoir scenarios should be examined for other target flows downstream using the new synthesized flows.

E-2-52/3

A scenario wherein Devil Canyon Dam is not constructed in the projected time frame should be presented.

E-2-56/2

A detailed discussion on ice processes should be presented.

E-2-57/5

To evaluate the effectiveness of the multiple level intake structures, their efficiency at removal of a layer of water at a particular depth must be analyzed hydraulically. The velocity at the port of the intake structure must be low enough to prevent upwelling at the face of the

dam. This is a common occurrence that effectively eliminates the functionality of these types of structures.

E-2-58/1

The strata modelled for the reservoirs during the winter under alternative operational scenarios must be presented. The ability of the structures to control temperature during the winter needs further documentation.

E-2-59/2

The process by which staging elevations were estimated should be documented. Under preproject conditions with lesser flows, staging is often much higher than these levels. Local flooding in November reportedly affects the town of Talkeetna.

E-2-61/1

There should be an explanation why turbidity in the top 100 feet of the reservoir is the main interest.

E-2-63/5

Other potential sources of waste water need to be listed.

E-2-64/3

We recognize that this section refers to the operational phases; however, there is no explanation how the valves will be operated during the initial filling and startup procedure. An explanation of the thermal effects of using these valves is also needed, since the valves will facilitate discharge of waters from the hypolimnion.

E-2-66/1-3

Data to support this presentation should be provided.

E-2-66/5-6

We disagree that navigation and transportation will not be significantly impacted. These are somewhat contradictory to the statements in E-2-66/5-6. Information to substantiate this conclusion should be presented.

In the continuation of paragraph 6 on the next page it is stated that "...caution will be required in navigating various reaches." Also E-2-67/2 refers to the winter season and the fact that winter travel by snowmachine and dog sled will be impeded.

E-2-67/1

Reduction of floating debris will not benefit navigation significantly in our opinion. Low water flows are expected to be the most significant hazard in the downstream reach. The source or data to support statements in this paragraph should be provided.

E-2-69/2

This paragraph conflicts with Page E-3-137, second paragraph, wherein it states the dam construction will adversely impact temperature from a fisheries perspective.

E-2-70/3

See earlier review comments for E-2-34/5 concerning the analysis needed to determine the water quality hazard from the discharge of concrete wastewater.

E-2-76/4

Documentation of the statement that, "As Devil Canyon reservoir is filled, additional fishery habitat will become available in the reservoir." should be provided.

E-2-87/1

Accurate discharge information on the creeks is needed to insure proper culvert sizing and fish passage. This information is needed to insure proper mitigation of potential impacts.

E-2-90/2

The minimum flow to maintain fisheries should be refined because 12,000 cfs may not be adequate.

E-2-90/3

The seasonal timing of the construction has not been addressed. This is an important factor in addressing fish and wildlife impacts.

E-2-91/2

Twelve thousand cfs for a flow at Gold Creek will not afford adequate access to 50 percent of available slough spawning habitat. A higher flow is required to maintain adequate access. This flow must be determined by an analytical process. Also, other life phases of fish in the downstream reaches below Devil Canyon are not addressed. All of the statements regarding the effects of 12,000 cfs flows are purely speculative and are not supported by data or measurements yet available. The release of water through the valves may present downstream thermal problems by releasing cold water in mid-summer.

E-2-91/4

Changes in downstream river morphology have not been fully assessed. To state that no mitigation is necessary to maintain slough habitats is premature. The lack of ice scour and flood flows may cause an aggradation of sediment in sloughs and may reduce natural cleaning processes necessary to maintain productive spawning substrate and rearing areas.

E-2-91/5 Line 8

Mitigation should be required and should be borne by the project developer as a standard project cost.

E-2-92/1

Data to support statements in this paragraph should be provided.

E-2-92/3

Thermal control by withdrawing water close to the surface can result in vortices causing air entrainment and supersaturation which is detrimental to fisheries. This subject should be addressed with supporting analysis to ensure that surface withdrawal of water can occur without detrimental impacts to fisheries.

The report cited did not demonstrate supersaturation because of faulty analytical techniques. The sample of water was not pressurized before gas chromatographic analysis as is required by standard methods.

Therefore, any supersaturation would have probably dissipated before the sample was analyzed. The study did show, however, that the thermal conditions will not be affected by the valve and that the temperature downstream will essentially be the same as the temperature at the withdrawal layer in the dam.

Tables

E-2-1 through E-2-20 References to data sources for tabular material should be made where they are missing.

Figures

E-2-1 through E-2-39 Reference to data sources for figures should be made where they are missing.

Appendix B

Susitna Hydroelectric Project, Draft Exhibit E

Volume 2, Chapter 3

Fish, Wildlife and Botanical Resources

GENERAL COMMENTS - FISH

This report lacks sufficient data to support most of the statements on project impacts, whether adverse or beneficial. It does not reference or use the literature or experience obtained from other hydro projects. Many of the statements regarding populations of fishes do not adequately reflect consideration of the instream flow requirements necessary to sustain those populations. It does not separate opinion from statements supported by correlative data regarding responses of the fishery to river regulation and impoundment. It also does not refer to or cite in the text the economic consequences of the flow regime presented. The document does not provide information relative to Alaska or other locations as to the success or failure of proposed mitigation measures. In short, the data base presented is insufficient to support most statements of impacts or the quantitative effects that the project will have on downstream fisheries.

Additional difficulties in reading the report are encountered due to lack of literature references, processes by which conclusions or assumptions were

developed, and an absence of lists of technical documents and their locations. Sources of tabular or figure material often are not cited. In general, mistakes are common, many errors are apparent, and the report is neither well organized nor edited.

GENERAL COMMENTS - WILDLIFE AND BOTANICAL RESOURCES

There are numerous typographical errors, incomplete sentences, and inconsistent or contradictory statements. The format is frequently violated with impacts of one project feature incorporated into the discussion under the heading of another feature. Terminology is at times inconsistent or vague. The level of detail varies greatly from one subsection to another with "minor" impacts often treated more comprehensively than "major" impacts. There are numerous examples of incompletely thought out ideas, some of which will not stand up to close scrutiny. These are all indications that the terrestrial portions of Draft Exhibit E, especially the impact sections, were written too quickly before information was organized and had received very little proofing. The draft is in such poor shape that a meaningful, detailed review is very difficult if not impossible. However, some major problem areas that require extensive modification of the impact and mitigation sections can be identified and specific examples of types of deficiencies can be cited.

1. Quantification of impacts - Magnitude of impacts are rarely indicated except in terms such as "minimal" or "moderate." Even those terms are rarely supported by a rationale. Most judgments of the significance of impacts appear to be subjective. While studies are incomplete, and some data (such as available vegetation maps) are of marginal value, it should be possible to place outer limits on many impacts, at least indicating the order of magnitude. Indication of the general proportion of a population's range subjected to a particular impact would be useful as a crude indicator of magnitude that could be refined at a later date. As written, the reader does not know if a species will lose 10 percent or 90 percent of its habitat.
2. Impacts based on current populations - Current populations are almost always used as the basis for impact assessment. Impacts are judged under current management plans and management strategies. This approach is not adequate for assessing many of the impacts of the Susitna Hydroelectric Project. Impacts should be assessed in terms of the range of population levels that could reasonably be expected to occur during the life of the impact. Current populations might be adequate for short-term impacts, as the population would not change greatly during that period. However for long-term impacts, such as those resulting from inundation of habitat, a full range of population levels that could be supported by the habitat (carrying capacity) and the range of management objectives that could be supported by those population levels should be presented.

SPECIFIC COMMENTS - FISH

Page/Paragraph

E-3-2/5

In this paragraph it is stated, "...criteria for assessing the relative importance of biological impact issues have been provided by....(2) comments and testimony by the Alaska Department of Fish and Game (Skoog, 1982; ...)." We have reviewed the text of Skoog, 1982 and, we do not believe this statement can be construed as establishing "...criteria for assessing relative importance of biological impact issues...." The context of the comments by ADF&G were specific to three alternative access plans, numbers 13, 16, and 17, and provided qualitative assessment of impacts for each of those plans. It was clearly noted in several areas of the letter that ADF&G's assessment was subjective and qualitative. We would like to state that the criteria by which project impacts are judged should lead to a quantifiable determination of impacts. These criteria for project access routes to our knowledge have not been established. Programs which will collect quantifiable information to insure equal consideration of fish and wildlife and their habitats and mitigation of those impacts in access corridors have not been performed.

A reference to Commissioner Skoog's April 1982 testimony to the APA Board of Directors would be appropriate. Also, references to comments

It should be recognized that carrying capacity as well as population levels may vary over time. Consequently, likely changes in carrying capacity during the life of an impact should be considered. Any action that maintains carrying capacity at a generally higher or lower level than expected in the absence of the project would have a positive or negative impact respectively.

Carrying capacity cannot always be measured. Where current populations are near carrying capacity, they are an appropriate measure even for long-term impacts. Where current populations are believed to be below carrying capacity, some estimate of carrying capacity is required. In some cases, historical population data may suffice. In other cases, measures of habitat quality may be used as direct or indirect indicators of carrying capacity.

There are numerous examples where the Draft Exhibit E completely ignores these concepts. Prime examples are caribou and wolf. Both populations are currently at levels below carrying capacity, caribou because of current management goals and wolves because of high harvest, much of which is illegal. Exhibit E concludes that project impacts would be minimal under current harvest levels and avoids discussing impacts that would occur if these goals and actions were altered and the populations were allowed to increase. Wildlife populations, user demand, and management goals have changed dramatically over the last 50 years and can be expected to continue to change over the life of the Susitna project. For example, increased hunter demand is likely to result in an upward adjustment of the caribou population and harvest.

goals, perhaps even before construction begins. If the Susitna project precludes attainment of goals that could have been attained without the project, there will be a negative impact that has not been adequately addressed by the Draft Exhibit E.

3. Failure to discuss cumulative impacts - Impacts are usually discussed one at a time, with little discussion of the potential cumulative effects on the population. Often each impact is sufficiently isolated that its effect on the population is judged "minimal." However the cumulative effect of all habitat alteration and all mortality factors may significantly affect the population's ability to sustain major impacts such as habitat loss. For example, inundation of moose winter range may reduce carrying capacity, increasing the impact of severe winters on the population. Project induced mortality could slow or even prevent recovery during subsequent years of milder winters. At the very least, there would be an impact on the amount of hunter use the population could sustain.
4. Ranking of impacts - When impacts are ranked, the most significant impact listed is often one that is easily mitigated. For example, increased hunter harvest resulting from improved access is often suggested to overwhelm all other impacts. In such cases, the discussion of other impacts is often cursory. However, hunting can be regulated and it is certain that the Board of Game will take measures to minimize adverse effects of hunting on wildlife populations, usually shifting the impact to the users. This treatment is inconsistent with that of

other easily mitigated impacts such as borrow pits where the impact after rectification (revegetation) is discussed.

By suggesting that the greatest impact will be unregulated hunting, a distorted view of total impacts is created. Less easily mitigated impacts such as loss of critical foods tend to be obscured and are discussed only superficially.

5. Incomplete and inconsistent treatment of impacts of improved access - Some of the greatest and longest term impacts of the Susitna project will be secondary effects of improved access and attraction of people to the area. This will likely precipitate development and increased recreational use of the area that might not occur for decades without the project. Impacts of improved access through hunting, including direct mortality, disturbance, and ORV use, are discussed repeatedly, often to the exclusion of less controllable impacts. But impacts of improved access through individuals other than the hunters are almost completely ignored. This is inconsistent and ignores a significant source of impacts.
6. Inadequate treatment of habitat alteration - Habitat alteration is consistently treated superficially. As noted above, this is sometimes done through failure to even roughly quantify the impact or consider cumulative effects. There are other examples where alteration is dismissed without adequate rationale. The most serious example is downstream impacts to moose habitat.

It is concluded that habitat may be enhanced between Devil Canyon and Talkeetna during the license period. However it fails to consider that areas of current early successional stages may become mature more rapidly than new areas will become vegetated, resulting in an immediate loss of habitat quality.

Changes in frequency of flooding are dismissed because bank full floods will still occur every 5 to 10 years. However this could reduce the rate of cutting and filling to 20 percent of current levels with a corresponding reduction in habitat created by that mechanism. Effects of peak floods and ice scouring below Talkeetna are dismissed even though changes in stage will exceed 4 feet in some areas.

This is an example where conclusions were presented without supporting rationale. Close scrutiny of the problem shows that the underlying rationale was either faulty or that alternative conclusions are possible.

The problems listed above, singly or in combination, work to systematically minimize potential impacts that might require mitigation. This appears to stem from a tendency to seek a rationale that nullifies the need to fully discuss impacts. However, if an underlying assumption is rejected (e.g., downstream effects on moose habitat), the entire section of the impact assessment becomes inadequate. Virtually every section of the wildlife impact assessment suffers from at least one of the problems listed.

Mitigation Plan

The wildlife mitigation plan is too incomplete to warrant detailed comments. Measures to avoid, minimize, or rectify impacts are scattered. Some are included in the vegetation section but there is little indication of how effective these measures will be for wildlife. It also is not clear which measures have been incorporated into the project design and which are merely recommendations from environmental consultants. The mitigation plan should clearly indicate how wildlife impacts are considered in the design of the project; what measures will be taken to avoid, minimize, or rectify impacts; and how effective these measures will be in mitigating losses. This is necessary to demonstrate that the option analysis the Susitna Hydroelectric Project Fish and Wildlife Mitigation Policy has been followed and so that residual impacts can be estimated for compensation planning.

The inadequacies of the impact assessment are evident in the mitigation plan. There is no mention of compensation for impacts to species other than moose. It is suggested that mitigation measures for moose will partially mitigate for losses to bears and wolves, but that will depend on what actions are taken and where. No mention of options for out-of-kind compensation is made.

and testimony provided by Schneider (1979, 1982 a.b.c.) are not cited in the bibliography.

E-3-3/1

The ADF&G disagrees that its policy implies "...that project impacts on fish and game species will be of greater concern than changes in the distribution and abundance of non-game wildlife and invertebrate species." First, the terms "fish and game" and "fish and wildlife" are used interchangeably throughout our policy document, and secondly, the ADF&G's greatest concern is fish and wildlife habitat and its ability to maintain productive populations. As stated in ADF&G policy, "The overall mitigative goal of the Department of Fish and Game is to maintain or establish an ecosystem with the project in place that is as nearly desirable as the ecosystem that would have been there in the absence of that project." We are primarily interested in maintaining the quality, quantity and diversity of the habitat for fish and wildlife with the project that is similar to that existing without the project.

E-3-3/2

The general tone of statements in this paragraph indicates a process of rationalization rather than of a clear sense of direction and logic. It is stated in this paragraph, "Where there is a high degree of confidence that an impact will actually occur, it has been ranked above impacts predicted with less certainty." For this thesis to have any

E-3-12/3

The Tyonek Village subsistence fishery is principally supported by Susitna River chinook salmon stocks, not "at least in part" as stated in the text. The Department not only recognizes the subsistence harvest of fish by Tyonek, but is responsible to insure the continuation of this stock of fish.

E-3-13/1

Throughout the discussion, the escapement year is unidentified.

E-3-13/4

Types of individuals or species of fish should be identified.

E-3-16/1

The statement that, "Out-migration in the reach from Talkeetna to Devil Canyon peaks prior to early June and terminates by the end of July throughout the drainage." requires documentation.

validity one must also specify the vulnerability of the resource to be evaluated. The same applies to assessing the process for evaluating the probability that an impact will occur. It is equally important, if not more so, to specify the magnitude of the impact that will occur.

E-3-3/3-4

The priority sequence for ADF&G mitigation policy is not only for mitigation option analysis in a planning sense but also for mitigation option implementation. We have five potential options for implementation as listed, and require an assessment which quantifies project impacts, and determines the parameters under which the project must operate to implement each option. The highest priority mitigation option which is feasible is the one which this Department will require for direct implementation. Quantifiable information sufficient to determine whether an option is feasible must be available to enable the ADF&G and others to select the appropriate mitigation option. As stated in the ADF&G mitigation policy, "The burden of proof to justify lower estimates of damage to fish and wildlife habitat lies with the developer."

E-3-5/3

We suggest that management strategies will require the concurrence of resource management boards and agencies.

E-3-7/2

Chinook, pink, chum and coho salmon mill at the entrance to Devil Canyon. Chinook salmon spawn in Devil Canyon in Cheechako Creek (RM 152.5) and Chinook Creek (RM 156.8). The lower limit of Devil Canyon is defined as RM 152. It would therefore be correct to state that "The Susitna River is a migrational corridor, spawning area and juvenile rearing area for five species of salmon from its point of discharge into Cook Inlet to upstream within Devil Canyon."

E-3-8/1

Impacts to less sensitive species with similar habitat requirements would be mitigated, however, species with a lower evaluation priority may be highly sensitive to change and may not be mitigated. For example, species that are adapted to turbid waters may be adversely affected if a project creates substantial decreases in turbidity. Burbot are an example of a species which may be so affected.

E-3-8/3

Chinook and coho do not have a greater commercial value than chums, although they do have a greater sport fishing value.

The projected change in conditions in the mainstem are not necessarily beneficial to rearing juveniles as suggested in this paragraph. The conditions (parameters) referred to should be identified. Further,

mainstem habitat will not necessarily be improved in winter months, higher turbidity is an example. Juveniles are also consistently present in sloughs. There are no data or literature cited to support the last two statements in this paragraph.

E-3-8/4

Arctic grayling also utilize mainstem habitats not only clearwater tributaries as implied.

E-3-9/1

What are the resident evaluation species below Talkeetna? None are indicated in the listing.

Rainbow and burbot should be included in the list of evaluation species because of their importance to the sport fishery and because of their abundance and adaptation to the turbid conditions. There may be a particular sensitivity to possible changes in the case of burbot.

E-3-10/3

Table E.3.3 does not reflect the 1.2 million figure discussed in text.

E-3-10/4

Table E.3.4. reflects different figures than the text with regard to chum salmon escapement. The chum salmon escapement was 20,800 and 49,100 in 1981 and 1982 respectively.

E-3-11/1

Value (ex-vessel) on coho salmon is not presented.

E-3-11/5

If Mills (1980) data are to be used to indicate significance of recreational use, the 1981 information should be included.

E-3-12/1

The harvest figures reported here reflect primarily Susitna River harvest. Additional harvest occurs on some of the anadromous species (chinook for example) outside the Susitna drainage, i.e., in Lower Cook Inlet saltwater fisheries. The statement that the sport fishing harvest is from an area larger than that which may be impacted is incorrect.

E-3-18/2

There are lakes with sockeye in the upper Susitna River (Talkeetna to Devil Canyon reach). The potential for sockeye enhancement in the upper Susitna Basin should also be mentioned.

E-3-19/3-4

Based on the 1982 evaluation of sonar versus tag/recapture Petersen estimates, the latter has been determined to be more representative of escapements than sonar estimates. Therefore, it is recommended that Petersen population estimates be used where available.

E-3-22/1-5

We suggest Petersen population estimates would be more meaningful in lieu of sonar counts for the stations at Sunshine, Talkeetna and Curry. The 1982 evaluation of sonar versus tag/recapture Petersen estimates indicates that the latter are more reliable. Therefore escapement should be defined on Petersen estimates when available.

E-3-24/1-7

The year the data represent is not stated in the text.

E-3-29/3

Grayling fry were captured at Watana Creek area in 1981, indicating spawning in the immediate vicinity.

The final sentence concludes that if other unidentified conditions are suitable, spawning habitat will not be a limiting factor for grayling.

This needs proper referencing and evaluation.

E-3-30/1

Burbot also inhabit Susitna River tributaries, not just the mainstem.

E-3-30/2

Areas downstream from Talkeetna of importance to burbot were identified specifically. The four mainstem sites upstream from Talkeetna should also be specifically identified.

E-3-31/3

The discussion of whitefish occurrence in the impoundment is not clear.

E-3-32/4

The juvenile longnose sucker collection effort was not sufficiently uniform to conclude changes in distribution from the catch per unit effort data.

E-3-37/3

Chinook salmon extend to RM 156.8 (Chinook Creek) not RM 158.2.

E-3-37/4

Resident species of sculpin also occur in the Susitna mainstem. The text should therefore report seven species.

E-3-40/1

Timing for respective salmon use based on 1981 data would be more accurate if changed to:

Coho - 30 July through mid-September,

Pink - 27 July through 20 August.

E-3-41/1

The Arctic lamprey also occurs in the Susitna River above the Chulitna confluence.

E-3-41/5

Based on set net and electrofishing catches in 1982, pink salmon mill in the Susitna mainstem immediately below Devil Canyon.

E-3-43/1

Not all sloughs are overtopped by flows of 20,000 to 24,000 cfs. Examples are Sloughs 10, 11, 14, and 15.

E-3-44/4

Holding areas at the mouth of sloughs are not considered a critical factor any more than "holding areas" at the confluence of many of the chum salmon producing streams. The fact that there are holding areas does not necessarily make the sloughs more productive.

E-3-44/8

In the last sentence, are the authors speaking of a tributary mouth or tributary? In either case, importance of the habitat type for rearing cannot be measured simply by number of fish captured at a site. This is particularly true for tributary mouths because they are part of the downstream and out-migratory pathway where fish may be seasonally concentrated.

E-3-46/4

These are not static populations. The populations of individuals becomes redistributed to favorable rearing habitat locations, including tributary mouths.

E-3-46/7

Chum salmon preference to slough habitat over tributary streams is unsupported. Only index surveys were conducted on tributaries whereas sloughs have been surveyed in total. The 1974 investigations and 1982 ADF&G surveys indicate that tributaries may be equally as important to overall chum salmon spawning in the Talkeetna to Devil Canyon reach as slough habitats.

E-3-47/1

Indian River is a major chum salmon spawning stream. Based on 1974, 1981, and 1982 escapement surveys, this stream supported higher numbers of chum salmon than chinook and coho salmon.

E-3-49/4

Eulachon were found upstream to RM 58 in 1981, and to RM 48 in 1982.

E-3-51/7

Based on 1981 and 1982 ADF&G spawning surveys, sloughs do serve as chum, sockeye and pink spawning habitat.

E-3-52/3

Yes, all species of salmon were recorded in tributaries in 1981 but sockeye were not found in notable numbers. We do know that the Chase Creek system supports a "small" sockeye run. ADF&G surveys are conducted in the half mile reach of tributaries upstream from the confluence with the Susitna River. The balance of the tributaries are not surveyed. If the report is to reflect that all species utilized tributaries, then it would be appropriate to modify Page E-3-46, paragraph 2 which presently excludes sockeye as being present in tributaries.

E-3-55/3

Fish Creek in the Big Lake drainage supports a significant rainbow trout population and also pink salmon.

E-3-62/4

Cheechako Creek is a chinook salmon spawning stream. Chinook salmon spawn both in the creek and the mixing area at its confluence with the Susitna River.

Gravel removal/dam construction will destroy this production area, which is a long term impact. The Cheechako Creek plume area is a spawning site. Will project impacts be mitigated here at least until Devil Canyon is built?

If Tsusena Creek will have the long-term and degree of impacts stated it seems contradictory and optimistic to say it will or can be rehabilitated.

E-3-65/4

Investigations should be conducted to determine the presence or absence of fish in the referenced lake.

E-3-67/3

This is a mid-summer estimate of only those grayling inhabiting the impoundment area and is not an accurate reflection upon the number of grayling that depend upon that same area for spawning, rearing, or wintering.

E-3-68/3

Data are required to support the suggestion that the reservoir may provide additional wintering habitat.

E-3-71/3

The ADF&G studies document juvenile salmon occurrence in mainstem habitats all summer. Catch rates were relatively low, however, and large numbers of fish could be present in low densities over a large area at any time.

E-3-73/4

Water temperatures of 5° to 6°C at Talkeetna during open water period may have major impact on returning adults. If higher flows will reduce temperature, it may be better to reduce flows or find ways to tap warmer layers of water for discharge.

E-3-74/2

The statements in this paragraph are speculative and reflect the need for further study and analysis.

E-3-75/2

Same comment as E-3-74, paragraph 2.

E-3-78/1

The statements here are speculative and not supported by data or references.

E-3-78/3

Beaver dams in Sloughs 9B and 19 did not inhibit use by adult salmon in August of 1982. Slough 9B had a peak survey count in 1982 of five chum and one sockeye salmon on 19 September. Low water condition in mid-August generally precluded adult salmon access to Slough 9 which is the access corridor for salmon using Slough 9B. Slough 19 was essentially void of adult salmon spawning in 1982. Only one pink salmon was observed in this slough and this fish was recorded on 4 August 1982. No beaver dams were present in Slough 19 which would have precluded fish access.

E-3-79/4

Deadhorse Creek (RM 121.0) is not an established anadromous fish stream. Occasionally, one or two adults enter this stream, usually pink salmon. However, no successful spawning has been documented.

Annually, Deadhorse Creek flows go below the surface in the lower one-third mile during the late fall and winter period.

It is questionable whether successful salmon production occurs in Sherman Creek. About 25 pink salmon entered Sherman Creek on or about 12 August 1982, presumably for spawning, it has not been established that the eggs will successfully incubate. The creek flows subsurface in the winter and eggs may be frozen.

Skull Creek (RM 124.7) is another stream which probably will be perched with flow changes in the Susitna mainstem. This creek supports a small chum salmon population.

E-3-80/1

Devil Creek (RM 161.0) would be equally accessible to salmon as Tsusena or Fog creeks. Devil Creek appears to have potential chinook salmon spawning habitat.

E-3-80/2

Data regarding flow characteristics are insufficient to substantiate minimal impacts into Susitna River reaches downstream from Talkeetna. A greater proportion of the Susitna River fishery resources utilize this downstream reach. A small change may affect a proportionately larger resource base.

E-3-80/3

See comments for E-3-80/2.

E-3-80/4

In addition to salmon utilization, the Susitna River reach from approximately RM 4.5 to RM 29 is almost entirely eulachon spawning habitat, sustaining a spawning adult population ranging in the millions of fish.

E-3-81/1

All resident species occupy mainstem habitats during ice free months, not "may" occupy.

E-3-82/1

Eulachon spawning limits extend from approximately RM 4.5 to RM 58.

E-3-82/3

Eulachon do not spawn in backwater or semi-placid areas. Principle spawning areas are adjacent to cut banks where the substrate included deposits of unconsolidated sands and gravels, and riffle zones or bars with relatively moderate velocity and unconsolidated sands and gravels.

E-3-88/4

The statement on sediment in this paragraph contradicts the statement on page E-3-90, paragraph 2, sentence 3.

E-3-90/1

These statements are not supported by data.

E-3-90/3

Ice cover would probably form at RM 114 not RM 14 as presented.

E-3-90/4

The impacts to fish habitat due to backwater and staging processes caused by increased post-project winter flows are not defined.

E-3-90/5

These statements are not supported by data and are speculative.

E-3-95/6

Eulachon do not spawn in backwaters. See comment on E-3-82, paragraph 3.

E-3-98/6

Other species are known to be present. A relatively small population of Dolly Varden inhabits the subject areas along with at least one sculpin species.

E-3-100/3

Additionally, Jack Long Creek supports adult coho salmon. Portage Creek also has spawning populations of chum and pink salmon.

E-3-103/3

Changes in streamflow during open-water seasons will affect slough habitats depending on the flow released. The potential for destroying these aquatic habitats appears high.

E-3-122/5

Does restricting unauthorized traffic mean that project personnel will be allowed to fish and the general public will not be allowed access to the fisheries? This may not be an acceptable form of mitigation during a construction phase that may span 20 years. The Board of Fisheries management decisions will also supercede the stated policy of APA on catch and release fisheries by project personnel. It does not seem likely that the public will be barred from the area while project personnel have exclusive access and use of the fisheries.

E-3-126/4

The lakes for water withdrawal should be identified and their resources inventoried.

E-3-127/2

Individual fish will not necessarily be lost by filling of the reservoir. Fish do not have to be moved through the diversion tunnel. Structural protection from passage through the tunnel is a potential mitigative measure.

E-3-130/3

A 10 percent reduction of flows during a critical and stressful period for fish does not constitute a minor reduction. The potential effect of reducing the November flow have on the recharge of groundwater reserves which will be needed throughout winter should be evaluated. Icing may take place much sooner with reduced flows and be much more severe.

E-3-130/4

There are no data presented to support the statements regarding fisheries impacts at the referenced flows.

E-3-131/5

Pink salmon fry moved out primarily during the ice breakup period.
Chums out-migrated primarily following the early run-off period.

E-3-134/2

There are no assurances that responses, i.e., releases of water, will happen quickly enough to keep from losing one year class of fish. By the time the problem appears to be sufficiently severe to warrant correction, it is most probably too late to act. This problem needs to be further examined.

E-3-134/4

We are not aware of testing of this procedure in this area of Alaska, or that the technique is feasible. Additional research needs to be conducted to evaluate the feasibility of the concept of introducing spawning substrate.

E-3-135/4

Data have not been presented to suggest this procedure will work for chinook salmon. It is as likely that suitably sized gravels placed in side channels, given maintenance flow, may attract chum salmon.

E-3-136/3

There is no definition of species to be produced, nor a management scenario. In addition a suitable location for the proposed hatchery facility has not been identified. To be considered a feasible mitigation alternative, these considerations must be included.

E-3-138/3

There are no data or references presented to document the feasibility of this mitigation approach. Altered thermal regimes in the mainstem and side-channels would cause potential pre-emergence of salmon fry in these areas. However, early emergence of salmon fry spawned in sloughs may not result as a consequence of higher mainstem temperatures. Therefore, the proposed feeding and rearing of pre-emergent salmon fry would not be resolved by the proposed spawning channel and rearing ponds (E-3-143-and 144) as mainstem fish would have no access to them.

E-3-138/4

A much larger number of grayling than included in this estimate depend upon the area to be inundated. Also, this is not a wintering population estimate.

Additional Comments on Mitigation

On a more general basis, the attitude implicit in the mitigation plan is that losses are inevitable but unquantifiable, and that some mitigation measures will be implemented but may not work. It is also implied that if monitoring demonstrates inadequacy of a mitigation measure other steps will be taken.

How and by whom will the effectiveness of mitigation measures be determined? Under natural conditions small sub-populations of salmon undergo extreme variations in survival. This will confound evaluation of the mitigation measures and could be a source of continuing conflict between the operators and the resource agencies. The frequent references to alternatives and operations which could be implemented if a mitigation measure proves inadequate puts the burden on the wrong parties. The mitigation aspects of this document are too tentative and too speculative. Substantially more detail and information is required before ADF&G can make a reasonable decision on mitigation methods.

Other additional comments specific to the mitigation section are as follows:

E-3-136 and E-3-140/1

Reference the following statement from the Exhibit E document:

"Since the effective mitigation measures to avoid, minimize, rectify or reduce impacts to the grayling population in the impoundment area are

not available, it will be necessary to compensate for the loss of these grayling. Compensation is proposed to be in the form of hatchery propagation of grayling... Sufficient grayling will be planted such the number [sic] of catchable grayling will be similar to the number lost."

The FRED Division of ADF&G has been experimenting with grayling culture for several years, first at Fire Lake, then Ft. Richardson, and now at Clear Hatchery. We are continuing to work with grayling and intend to develop techniques that someday will support a grayling production program. At this time and for the foreseeable future, grayling production in Alaska must be considered experimental. In brief, several factors impact hatchery grayling production:

1. It is difficult to find egg sources that are sufficient in number. Whereas salmon egg takes in the tens of millions are common, a one million grayling egg take is a major undertaking.
2. The eggs and fry are extremely small and from a culturist's standpoint, very difficult to work with. Grayling fry hatch at 30,000 per pound as compared with salmon which are ten times that size at emergence. Marking and therefore evaluation of survival after stocking are not possible with existing technology.
3. Survival from green egg to fry have generally been low - 50 percent as compared to 80 to 95 percent for salmon production.

E-3-26/4

Eulachon are known to extend as far upstream as RM 58 based on 1981 observations by Su Hydro Aquatic Studies staff. The RM 48 figure provided by Trent (1982) was for 1982 observations.

E-3-28/2

Principal study areas were located in the first mile of the tributaries upstream of their confluence with the Susitna. The reference to upper stream reaches in the fourth sentence should be removed.

E-3-29/1, Subsections 1 and 2

These statements are speculative and cannot be supported by existing data.

E-3-29/2

A much larger number of grayling depend upon the area to be inundated over and above those included in this estimate.

4. Attempts to rear fry in hatcheries have been largely unsuccessful. The obvious survival advantage that could be gained by releasing larger fish cannot be obtained until techniques are developed which will permit holding and feeding of fry. Grayling have been successfully reared in the lower 48. However, those fish hatch at a larger size (20,000 per pound) and behave differently in raceways.

We intend to overcome these problems as we learn more about the performance of grayling in our hatcheries. However, the idea that an irrevocable loss of grayling due to habitat inundation can be compensated by hatchery propagation must be judged speculative at this point.

The development and operation of spawning channels and the modifications of sloughs, that has been proposed as mitigation warrants further discussion.

Reference the following seven excerpts from Chapter 3, of the Draft Exhibit E document:

1. "The slough habitat for the incubating salmon embryos may be enhanced through increased intergravel flow associated with larger flows, or it may be degraded if the higher flows substantially alter the intergravel temperature regime or ice conditions."
[E-3-131]

2. "The [proposed] flows are of sufficient magnitude, however, to undertake to rectifying (SIC) impacts to salmon spawning activity by modifying existing spawning habitat to maintain natural spawning by salmon." [E-3-132]
3. "If further impact reduction is required to maintain existing fish populations, additional mitigation measures will be incorporated. Certain target mitigation issues will receive priority in the monitoring program." [E-3-133]
4. "The outmigration of salmon fry will be monitored to evaluate if proper timing of outmigration is achieved. The basis for such an evaluation will be the baseline outmigration studies and within year comparison to adjacent unregulated systems." [E-3-134]
5. "Success of a multi-level intake depends on the thermal structure of the reservoir, the existence of sufficient water at the desired temperature and location with the reservoir...Temperatures near this [8 to 12°C] range may exist in the top 100 feet...If this layer is present, it can be accessed by the multi-level intake gates..." [E-3-137, 138]
6. "The most significant adverse impact associated with the altered thermal regime would be accelerated incubation and early emergence of salmon fry...The modified sloughs or spawning channels designed to rectify or compensate for lost spawning and incubating habitat will be provided with a rearing pond at their downstream end..."

Used to collect early emergents and hold them to prevent their downstream migration...Until appropriate conditions, including temperatures are reached in downstream habitats." [E-3-138]

7. The fry will be fed if natural food production is insufficient to support the number of fry present." [E-3-144]

In response to the above: The major problems appear to be flow alteration with resulting affects on slough access, hydraulics and water temperature. As might be expected, the determination of the degree of impact (loss of habitat and fish) is very difficult to quantify and there is not specific information provided. Instead, engineering solutions are proposed for engineering problems. Modified sloughs also known as spawning channels are addressed on a conceptual level. Somehow it is proposed, that an unquantifiable loss of fish will be rectified/compensated by a multi-purpose habitat modification program which includes channelization, flow control structures with day-to-day flow alteration, gravel cleaning, gravel introduction, enhancement of upwelling, rearing ponds with fry screens on the outlets and artificial feeding of fry.

The engineering, construction and operation of these channels is totally lacking in detail. There are not operational spawning channels for these species in Alaska. Canada has had mixed success, but they are located in environments far more temperate.

The cost of maintenance and operation of these channels should be included in any determination of feasibility. The proposed demonstration project should focus on fish production and survival as well as the physical properties of the modified slough.

The concern about changes in the thermal regime are inadequately addressed. It is apparent that the impoundment temperatures and hence the utility of a multi-level intake are not known. The rearing ponds at the downstream end of the channels may not be effective in accomplishing the desired objective. Emergence of fry will not occur within a short time span but over a period of weeks. Therefore, at any given time the fish in the slough or pond will cover a wide range of developmental stages. A schedule of "release" of these fry into the mainstream must be provided. Once emergence timing is upset due to altered temperatures it is unlikely that survival levels could be maintained by holding them in a pond.

Fry will not automatically feed on an artificial diet, there is an aspect of "training" which is obviously successful in a hatchery raceway. Washington has had some success with pond culture but the fish are generally hatchery lots of similar size.

Assuming that the 'operator' of these sloughs and the proposed rearing ponds determines that artificial feeding is required, how will this be accomplished through the ice cover that may develop on the rearing ponds?

SPECIFIC COMMENTS - WILDLIFE AND BOTANICAL RESOURCES

The following specific comments are intended to illustrate the types of deficiencies in the wildlife sections of the draft Exhibit E. The poor state of editing and overriding major problems listed in the general comments precluded a complete listing of inconsistencies, errors, omissions and other deficiencies.

Page

E-3-279

Rationale for considering alteration of habitat less significant than hazards is not supported.

Increased predation is mentioned on page 284, with no indication of its significance to the population, but ignored in the ranking of impacts. The current moose population is highly impacted by predators. The project is likely to increase the vulnerability of the moose population to predation in several ways. Brown bear and wolf populations are likely to be less affected than moose in the early years of the project, causing an alteration in predator/prey ratios. The project could reduce the availability of spring foods for bears and caribou for certain wolf packs, causing a further increase in predation on moose. The drawdown zone and ice conditions are likely to facilitate hunting of moose by wolves. The moose population may have reduced productivity

because of poorer habitat quality, especially after severe winters, reducing its ability to sustain predation. These factors could allow predation to drive the moose population to very low levels and maintain it there for long periods. Similar situations have occurred throughout much of Interior Alaska. Ultimately predator populations would suffer and any habitat enhancement attempts could fail.

E-3-280

Sections relating to impoundment clearing are inconsistent, illustrating poor editing and confusion about the certainty of mitigative actions. Most sections assume the impoundments will be cleared in a stepwise manner, but on page 306 it says, "If portions of the impoundment are cleared..." On page 286 it suggests a brief increase in forage, but on page 287 it predicts a substantial reduction in value.

Moose are sometimes attracted to areas being logged by availability of branches of deciduous trees.

E-3-283

Overuse of winter range can lead to reduced natality as well as mortality. Moose that never use impoundment areas will be impacted by over utilization of adjacent areas (see page 287 also). This could expand the zone of impact for several decades.

E-3-284

No rationale for concluding that mortality factors will have a negligible effect on the population. Mortality along access routes should be considered along with dam construction activities because they occur together.

E-3-288

It should be possible to quantify areas subject to erosion (and other types of habitat alteration) and estimate the proportion that will revegetate. This is an example of an impact that is mentioned with potential negative and positive effects then dropped. The reader has no idea how much area will be affected and whether the net impact on moose will be positive or negative.

Effects of drifted snow on vegetation, availability of vegetation and phenology are not addressed.

E-3-289-290

See general comments on adequacy of assessment of downstream effects on vegetation. Frequency of flooding (290 first paragraph) is probably very important. No rationale is provided for assessment of the effects of ice scouring on vegetation. The potential effects of scouring should be quantified.

E-3-290

The effects of drifted snow on movements of moose are not mentioned here, but are for caribou (page 298).

E-3-292

Increased mortality resulting from increased predation should be considered. Floating ice during latter stages of breakup could have the same effect as floating debris.

Accidental kills will continue during operation of Watana.

E-3-294

The summary of impacts for Watana comes closest to addressing cumulative impacts. However it is not systematic, ignores some impacts mentioned earlier and contains many subjective judgements that are not supported by quantitative rationale. It also does not include impacts of access routes and transmission lines which must accompany Watana. The uninformed reader is likely to be confused and have no real concept of the range of potential changes in moose populations.

E-3-297

There is no basis for the conclusion that the Nelchina caribou herd will not use the area north of the impoundments at its current population size. It is highly likely that this area of high quality range will be used heavily in the future even at moderate population levels.

Large movements of caribou across the impoundment areas have only been observed once since 1973. Movements were not monitored closely in most years.

It is highly likely that the management goal of 20,000 caribou will be modified, perhaps before Watana is constructed. Therefore the conclusions about level of impact are invalid even if the assumptions about range use were correct.

E-3-298

Statements about drifting snow remaining in the impoundment conflict with statements made in the Feasibility Report. This needs to be clarified and documented.

E-3-298

The most significant mortality factor to caribou could be floating ice. In many years the spring migration to the calving grounds would coincide with breakup of the Watana impoundment. During a period of northerly winds, caribou could encounter open water when they reach the north shore. Seeing no obvious barrier they would start to swim across and would encounter a mass of broken floating ice. This would create a problem similar to floating debris. Mortality could be substantial in some years.

E-3-299

The impression is created that the four possible responses are mutually exclusive. More likely all four responses will be exhibited by varying proportions of the herd.

E-3-300

The statement that the Mount Watana sheep population does not occur near the impoundment is an example of a statement based on a brief period of observation. Sheep have been observed near the impoundment in the past.

E-3-301

All portions of exposed soil at the Jay Creek mineral lick are not used equally. Some of the most heavily used areas are low on the bluff. Therefore the percentage of the lick that would be inundated is misleading. This is also an example of an "operation" impact being discussed under "construction."

E-3-305

Carrion is not mentioned as a spring brown bear food in the first paragraph.

The assumption that spring foods are not important to bears is incorrect. Food intake during periods of stable weight or even weight loss can be absolutely critical because it reduces a negative energy balance. A prime example is the importance of winter forage for moose.

The suggestion that loss of carrion is more important than loss of green vegetation is questionable. A moderate quality, but abundant, food may be more important to the population than a high quality, but sparse, food.

The assumption that, because lactating female brown bear do not use areas that would be inundated, other bears could do well without those areas is not supportable. Females with cubs probably have overriding reasons to avoid these areas. This includes the cub's ability to

travel and the risk of predation on cubs by males. Pregnant females develop heavier fat deposits that probably help sustain them during this period. A female that was not able to coast through this period would probably lose her cubs and move to riparian areas near the river. Spring foods in the impoundments are probably most important to yearlings which emerge from dens in poorer condition, particularly in years following poor berry crops, and suffer the highest rate of mortality. It is unreasonable to conclude that yearlings could survive as well as a lactating female without spring foods.

E-3-303-308

Importance of spring foods to brown bears is inconsistent among "construction," "filling" and "operation" sections.

E-3-308

While bears are capable of crossing the impoundments and some will, there still may be a hindrance of movements between seasonal food concentrations that could reduce productivity of the population. This section is inconsistent with a similar section on black bears (page 310). This is another example of where the potential significance of an impact to the population is not discussed in even general terms.

The fact that healthy bear populations exist where salmon are not available is not pertinent. Salmon are one of several seasonal food concentrations. They are probably most important during years when

other summer foods, such as berries fail. Bear productivity and survival are probably higher because salmon are present and hence the population is generally higher.

The entire brown bear impacts section is filled with unsubstantiated speculation. Most of it is biased towards minimizing potential impacts. It fails to consider how several impact mechanisms may work in combination and how they might influence the population. The impact section should list important foods of bears by season, indicate how the project might influence the availability of each food to bears, and indicate the possible effects of these changes in availability on bear productivity and survival.

E-3-310

The consequences of disturbance of denning black bear during clearing are not emphasized. This is likely to cause problems for both bears and crews. A number of bears are likely to be shot. Many of the disturbed bears will not be able to find new dens and mortality is likely to be high. This can result in a more rapid, more violent and more visible adjustment of the bear population to the project.

E-3-310

There currently is no resident black bear population near the Tyone River confluence and the Fog Lake area supports low densities. Therefore it is unreasonable to expect these areas to support viable populations during operation.

E-3-310

Project facilities may block movements of bears from the Devil Canyon impoundment area to berry areas adjacent to Watana.

E-3-311-312

The entire wolf impact section is deficient in that it fails to adequately address impacts of reduced prey densities.

Caribou populations may be reduced. Even if changes in caribou numbers are minor the distribution is likely to be altered in a way that reduces availability of caribou to specific packs. There are data from the Susitna basin indicating that moose densities influence wolf territory size, pack size and pack stability. Some current territories may be reduced to the point where social factors would cause loss of a pack.

E-3-313

The statement that the amount of habitat lost would potentially affect only two wolverines is not completely accurate. The habitat lost will remove portions of territories of a number of wolverines, not all of only two territories.

E-3-314

Impacts of prey loss on belukha whales is inadequately addressed. This section appears to focus on adult salmon only. Outmigrating salmon and eulachon are more likely the foods attracting belukhas to the area. Eulachon in particular may be important. Until effects of the project on the availability of these foods are determined, no conclusions on impacts on belukha can be drawn.

E-3-340

Statements of climatic effects should be documented and quantified with regard to magnitude of impact.

Elimination of ice scouring is suggested as a benefit, yet ice scouring may be the most important factor maintaining early successional stages north of Talkeetna (on page 289 reduction in ice scouring is seen as detrimental). Even the potential short term benefits may be offset by current shrub communities advancing to more mature stages.

E-3-341

The flow regime would be used for fisheries management and its affect on vegetation should be identified. It could prevent vegetation of newly exposed substrate and further offset the potential benefits suggested on page 340.

E-3-340-342

The discussion of downstream effects of Devil Canyon Dam are misleading. On page 340 it states "moose may benefit from an increased availability of riparian habitat." Then, on page 341 it points out that much of the habitat will not be available in winter because of open water. (The potential effects of ice fog on use of these areas by moose is ignored.) Finally on page 342 it pulls the two statements together and states that effects on moose could be "moderate to

severe." Then on page 370 it says changes in vegetation will have a "small population - level effect."

This is an example where the combined effects of several impacts have not been clearly thought out. The full range of possible changes in vegetation has not been discussed, only the most optimistic possibilities. When one of several potential overriding factors is identified, the acreage affected is not quantified.

A far more enlightening impact assessment should be possible by building a simple model with existing data. The analysis on page 172 takes a step in the right direction but does not carry it to a useful conclusion. It crudely estimates the maximum acreage that could become available for vegetation. This should be refined to estimate the amount that would enter productive successional stages annually during the life of the project. Uncertainties about rates of colonization would produce a broad range of estimates, but the order of magnitude of change and more importantly the chronological patterns of change should become apparent. Similar estimates for currently productive habitat that will advance to mature stages should be subtracted to provide an estimate of net change in acreage of value to moose. The proportions of this acreage that occurs on islands and would be inaccessible to moose during winter should be subtracted to produce a crude estimate of possible changes in available winter range.

A similar systematic approach should be applied to all areas that might be subject to habitat loss or alteration. Impacts that show a

potential for serious effects can then be studied in more detail to refine the estimates for mitigation planning.

E-3-342

Devil Canyon impoundment will primarily affect different moose than Watana. Therefore the statement that moose population will have already been greatly reduced is misleading. The summary of impacts uses the word "minimal" five times in reference to impacts on moose in the upper basin, but completely fails to convey any impression of the range of population changes that could occur during the life of the project.

E-3-343

"... small proportion of acceptable black bear habitat ..." What proportion of what area? How important is that proportion?

E-3-350

The orientation of access routes in relation to wildlife concentrations and movement patterns should be considered. Some subpopulations will be more heavily impacted than others. Mortality and habitat loss from access routes should be added to other impacts affecting the same subpopulations during the same time periods.

E-3-351

Impacts of road and railroad traffic start at tidewater. Increases in unscheduled traffic on existing roads, particularly the Parks and Denali Highways are likely to be substantial. Levels should be estimated and impacts assessed.

E-3-352

The timing of railroad and highway traffic is more important than an average rate. Both seasonal and diurnal patterns should be considered. Scheduling of traffic should be considered as a mitigation measure.

Secondary impacts of access routes, other than hunting, should be considered.

Combined effects of access potential of transmission corridors and access routes should be considered.

E-3-355

Caribou calving north of the Susitna River is sufficiently dispersed that no alignment of the Denali access road will avoid calving areas completely.

E-3-356

Frequency of traffic will be substantially higher during construction unless unscheduled traffic is restricted.

E-3-355-356

It is not always clear which "herd" is being referred to. The Denali access road runs through a central part of the upper Susitna-Nenana subherd's range. It also runs through one of the highest quality portions of the main Nelchina herd's range. Use of the word "peripheral" is highly misleading.

Potential cumulative effects of the access routes and impoundments on caribou range use should be discussed.

E-3-359

Potential alterations of prey distribution, especially caribou, on specific wolf packs should be discussed.

E-3-360

The access routes will provide excellent access to tundra habitats. Therefore human use of areas important to wolverine during summer will increase.

E-3-366-368

Transmission corridors should be considered along with other impacts. For example where they intersect the range of a subpopulation the changes in habitat quality should be added to changes caused by other project features within the range of the same subpopulation.

Placement and management of transmission lines in proximity to roads and railroads can influence animal movements and rates of mortality. For example moose train collisions could be greatly increased if a transmission corridor attracted moose in a manner that increased crossings of the railroad.

E-3-370-371

The big game impact summary is completely inadequate. It addresses only impacts on existing populations. It ignores many impacts, including some judged substantial, suggesting that these need not be mitigated. It conveys no impression of the potential magnitude of change, even in current populations. The one effort at quantification uses the smallest possible number of moose that would be impacted by one mechanism. Even those numbers are stated in a misleading way. They are numbers estimated on one survey during a mild winter. There is no basis for the statement that this represents "most years," and it certainly does not represent even a minimum number of moose that would be eliminated by the project.

Appendix C

Susitna Hydroelectric Project, Draft Exhibit E Volume 3, Chapter 5 Socioeconomic Impact

GENERAL COMMENTS

The ADF&G has continuously expressed concern regarding the adequacy of socioeconomic studies relating to the determination and assessment of potential impacts of the Susitna Hydroelectric project to fish and wildlife. Expression of these concerns dates back to initial meetings with the Alaska Power Authority in 1979. The original study plan developed by the ADF&G in 1979 contained an objective designed to assess these very impacts.

Upon review of this chapter, these concerns remain. In our view, little substantial progress has been made to define project related socioeconomic impacts.

Impacts to fish and wildlife users have not been adequately addressed, either in the areas most directly effected by construction or those areas outside the immediate project area. Portions of the fish and wildlife resources produced within the Susitna project area are harvested or utilized in other more distant regions. There needs to be an assessment of these uses of fish and wildlife with regard to (1) identification of resources used; (2) quantification of use levels; (3) description of use patterns including seasonality, its context within the local communities, etc.; and (4) description of geographic areas of use.

Throughout this chapter reference is made to current and/or planned studies. These studies, however, are not described, objectives are not presented and time of implementation or completion is not defined.

SPECIFIC COMMENTS

Page/Paragraph

E-5-6/1

Only characteristics of personal monetary income have been described. There should be some description (especially in the Local Impact Area) of relative importance of natural resource harvests as part of the household income. Any income determination need not necessarily be made in monetary terms, but should be done (1) qualitatively by (a) assigning importance values to the harvest and use of each resource; (b) assessing culturally significant practices; (c) describing the type of economic organization of the area; and (2) quantitatively by (a) assessing amounts of time spent harvesting resources; (b) assessing estimated proportions of household food consumption; (c) determining amounts of money spent in pursuit of wild resources; and (d) expressing the overall output or consumption of a household unit.

E-5-12/4-6

This section on recreational facilities related to fish and wildlife resources would be more appropriately termed recreational opportunities. This area has an abundance of opportunities but little development like trail systems, shelters and other man-made facilities. A full assessment of the use of these opportunities and existing facilities would be appropriate. Certainly there is information available on Mt. McKinley National Park and the State park recreation areas.

E-5-54/4

The indirect influences affecting commercial businesses dependent upon fish and wildlife resources as discussed are undefined.

E-5-54/5

The "partial short term displacement" as discussed is not defined. The statement made that with increased access, business opportunities will increase is purely speculative. One might also expect business opportunities to be reduced as a result of increased access, particularly if the business is associated with the commercial use the of limited fish and wildlife resources.

E-5-54/7

This paragraph indicates similar factors are necessary for both successful lodge and guide operations. This statement is incorrect.

Commercial lodges are most successful with improved access and visitation by large numbers of visitors or customers. With construction of new roads, railroads and airstrips the project area would appear to best fit this category.

A big game guide, on the other hand, appreciates and can tolerate less competition from additional hunters and recreational visitors. His type of business best functions at low levels of human activity and participation.

E-5-54/8

Loss of additional habitat, and the change in location and amount of salmon harvested as stated requires definition. The statement "long term" impacts to Cook Inlet fishermen and other fish and wildlife users will be small, is speculative. Long term is not defined, nor are "other user groups," or "recent activity levels." No supportive data or study results are presented to support this statement. Types of on-going studies should also be clarified and referenced.

This entire section includes many categories of users who are not licensed. Trappers and subsistence users, for example, are not

required to have business licenses to operate. The definition of business needs to be presented.

SECTION 3.7, LOCAL AND REGIONAL IMPACTS ON FISH AND WILDLIFE USER GROUPS

General Comments

1. Organizationally, the section of FISH is not comparable to that of GAME which make it deficient in the presentation of vital information:
 - a. It makes no mention of guided sport fishing activities which are a major use of the Susitna River and its tributaries.
 - b. No mention is made of fishing lodge operations dependent on Susitna River fisheries.
 - c. No category comparable to that of "The Hunter," E-5-75, is made for sport or subsistence fishermen.
 - d. The category "Resources" on E-5-75 elaborates on game resources, their characteristics and the users of those resources. Only limited information is currently available pertaining to recreational and subsistence uses in the Susitna River Basin. There is a need for additional data collection.

- e. In the Game section, no "Methodology" is presented as it is for Fish.

Although it may be true that impacts to the fishery resource depend upon loss of habitat and subsequent loss of fish, the issue in this section (3.7) is also the impact upon user groups. In this case, the methodology in this chapter should address both impacts to the respective user groups, and to fish and wildlife resources.

Specific Comments

E-5-68/1-3

This section is labeled "Methodology," but provides no methods appropriate to the evaluation of impacts to user groups. Implicit in this type of evaluation is the need for a measure of existing use. The only statement defining methods is included in Paragraph 2 which described data used to determine impacts of the dam on the fishery resources. It should be noted that pink salmon are more abundant on even years than on odd numbered years. As such, 1981 was a year of low pink salmon occurrence.

E-5-68

A survey of community usage of wild resources by Cantwell would be useful in assessing levels of use and importance of the salmon, moose, caribou, and other resources.

The Cantwell area is likely to be affected by (1) wildlife population fluctuations due to construction activity; (2) population fluctuations because of increased hunting pressure which could result from (a) increased human population, and/or (b) increased access to resources.

While local residents may not appear as a "significant" portion of the overall harvest, those resources may very well be important to the community in many ways.

E-5-68/4

The assumption is made in the first sentence that "...the commercial fishery for salmon produced in the Susitna system occurs only in Upper Cook Inlet." This assumption is invalid since Susitna River salmon stocks are harvested throughout Cook Inlet, including the lower district. Impacts to Susitna River fish are indeterminable because it is not possible to separate the mixed salmon stocks as they migrate through Cook Inlet.

E-5-68-69/5

The monetary figures presented here cannot be used to determine the specific financial loss of Susitna fish, because of the mixed stock (see comment E-5-68/4). Many of these fish are Kenai River or Kasilof River fish.

E-5-69/3

The first sentence states "The specific impacts which would result from construction of the Susitna dams have not been determined in a manner which allows accurate quantification." This statement invalidates comments in E-5-70/1-3, and statements in other Draft Exhibit E report chapters.

The paragraph does not address impacts to Susitna River salmon resources downstream of Talkeetna. Greater salmon occurrence exists in these areas, than does the area further upstream of Talkeetna.

E-5-70/3

Chinook salmon are harvested incidentally by commercial fishermen in both upper and lower Cook Inlet. Project impacts to these users requires definition as do the criteria for establishing "significant quantities" as stated.

E-5-71/1

Personal communications with sport fish biologists should be properly cited.

E-5-71/2

The discussion indicates the area and level of impacts to resident and migratory fishes is not determined. Chapter 2 and Chapter 3 of the Draft Exhibit E present relatively detailed presentations of these impacts.

The statement, "Data on specific angler use of the Susitna and tributaries above the Talkeetna River confluence are virtually nonexistent." is incorrect. Data are available on angling use in this area from the ADF&G Statewide Harvest Survey.

Impacts are limited not only to areas upstream of the Talkeetna River confluence, as implied. Sport harvest of stocks utilizing the upper Susitna River are thought to occur elsewhere in Cook Inlet, as far south as the Homer area.

E-5-71/4

Table E.5.40 as referenced in the paragraph omits burbot in the list of major species. This paragraph states study is underway to define recreational values of Susitna River fisheries resources which may be

impacted by the project. We are unaware of these studies, and they should be referenced.

Section Summary:

The sport fish discussion is not complete nor does it compare with the commercial section in the presentation of figures and numbers. For example, population estimates are available for several species as are data regarding recreational utilization. These data are not presented. The research mentioned as "currently underway" is not referenced.

E-5-71/5

Generally, the section on Subsistence Fishing is based on the assumption that the harvests which occur in Cook Inlet are from the Susitna River. This assumption is not necessarily true as most of the effort occurred in the Central District where Kenai and Kasilof salmon stocks are taken. Information in Stanek (1980) indicated the residency of subsistence permit holders. Net survey information (Stanek, unpublished data) is available depicting general areas utilized by subsistence fishermen in the Northern District. Similar information is available for the Central District (ADF&G, 1980).

Additional assessment of user groups should be made under the category of domestic use of salmon. Salmon for domestic use is obtained from commercial, sport and subsistence fisheries.

Information on use of salmon resources in Tyonek is also available (Stanek and Foster, 1980). More recently, data were collected during the spring of 1982 on the specific uses of salmon by Tyonek residents (Foster, 1982). It is assumed that most of the chinook salmon caught in the subsistence fishery at Tyonek are Susitna River fish.

E-5-72/2

The value of "subsistence" caught fish cannot adequately be determined using a shadow price. Usher (1976) described the difficulty in determining the value of wild foods. The "point of subsistence capture estimate" would not adequately estimate value. A more appropriate value would be the processed cost. In addition, the nutritional value, cultural value, and equipment investment must be added as cost qualifiers.

It is also stated that value might be determined using "...the price of an equally desirable alternative food source." A major question would be how an equally desirable food would be determined when, for many people, there is not a better source in terms of quality, nutritional value, cultural value, social value and recreational value. Indeed, salmon is the standard by which value is determined.

E-5-73

Under the category of Game there is no section on methodology as under the Fish section.

In the section on "Guides and Guide Services" there is no quantification of the number of guides operating in the area or their revenue. In addition quantification of the numbers of people providing outfitting and transporting services that are not guides is required. Information is available from the ADF&G and from the Guide Licensing and Control Board.

E-5-74/2-3

There is no discussion of available data (Phase 1 of big game reports) that provide estimates of losses of animals, effects of access, new hunting regulations, etc., that would influence "available harvestable animals."

In the category of "Lodge Operators" no indication is made of the amounts of services and relative value of services furnished.

Many additional lodges on the highway system provide services to the individuals who hunt along the highway system or who use the highway system as a point of departure.

E-5-75/2

Apparently the intention of the statement "The impact of the proposed project on the lodge operators would be indirect and of the same nature as that of the guiding industry." is that any direct impacts would be upon the resources. However, in the case of the inundation of land areas utilized for hunting, camps and travel, the impact would be direct.

E-5-76/2

Reference to the figure 71,000 animals must be put into proper perspective with regard to the present management for the population and range carrying capacity.

E-5-76/3

The information presented deals with the residency of hunters rather than the experiences they seek.

E-5-77/1

A comparison is drawn between hunting pressures or numbers of hunters during the early 1970's and 1980's. Hunting pressure is a function of the number of permits and the number of animals in recent years. This paragraph is misleading and, in fact, the comparisons are invalid.

E-5-78/5

The category "Experience Sought" is inappropriate for the informational content of this section. It provides information on characteristics of user groups.

E-5-79/2

Although harvest ticket reports allow for the reporting of multiple means of transportation, analysis of the data allow for only one primary means of transport. The use of highway vehicles is the most common method of transport to the general area. Within the area, however, other forms are more common.

E-5-80/1

References should be noted with regard to who is doing the studies and their schedules for completion.

E-5-80/2

The first sentence is misleading and inaccurate because the implication is that regulations will be of greatest impact to the users. Regulations are a function of resource status and user groups characteristics. Those regulations which may be promulgated due to any reduction in quantities of resources are a reflection of resource status and perhaps increased user access to the area.

The statement, "In such cases, the project would cause little or no additional reduction in hunting opportunity." when referring to already stringent regulations on some species is inaccurate. Indeed, some regulations are more stringent as with caribou, but may become even more stringent if range is inundated and the area of available habitat is reduced. Regulations on increasing numbers of moose in the region may be relaxed in the near future, but if these prove unsatisfactory and mitigation measures do not compensate for moose losses in the impoundment area, further restrictions may be required.

E-5-80/3

The statements indicating that regulatory structures will be the major impact on the user is misleading and inappropriately identified as the major impact on the user.

E-5-80/4

There is no indication of how the quality of the surrounding environment will be changed thereby affecting the expectations of the user.

E-5-81/2

Subsistence users in the region have not been identified with regard to the use of game resources, except caribou. In this case, a set of criteria were developed which qualify a certain number of people on a

first-come first-served basis. For other game resources, further work is required to determine resource use patterns. Information provided in the text refers only to caribou.

Although "bringing home food meat may be the 'main goal,'" there are other goals of the user. These include (1) obtaining a high quality goods at a relatively low price; (2) fulfilling certain cultural traditions and obligations to the community and/or family; (3) attaining goals of self-determination and independence of welfare programs; and (4) attaining the knowledge and ability to support one's self.

E-5-82/3-4 & E-5-83/1

Data limitations on trappers do exist; however, a survey of trappers in the Local Impact Area would be appropriate.

E-5-84/5

The term "on balance" is unclear. There is some question as to whether existing trappers will benefit or if there will just be more numbers of trappers due to access. It is doubtful that increased access to the inundated area will, in fact, benefit trappers since fluctuating water levels will not benefit more aquatic species especially if draw-downs occur during winter months where food caches and burrows may become inaccessible.

E-5-85/2-3

Construction of access roads and transmission lines may provide added access to some areas for trappers. However, the loss of habitat and increased pressure on martens from trapping and human activity generally may reduce the numbers of marten and thereby be a major loss to trappers. Paragraph 3 more accurately portrays likely impacts than does paragraph 2.

E-5-86/3-4

The assessment of trapping activity and its importance to users in the Local Impact Area should be more extensive. There is some confusion as to who an Alaskan trapper is, compared to "recreational" trappers who supplement their income by trapping. Especially when, as stated in paragraph 4, "It is estimated that there are a large number of residents in the Local Impact Area who do some trapping on a part-time basis....," more information is required on how large this group is and the level of importance trapping is to them.

E-5-88/4-6

There is no mention of what people's attitudes were toward changes in section other than 3.1 and 3.5. Because natural resource use is important in the area, there should be some indication of local attitudes toward changes in the availability of resources.

It therefore follows from E-5-89/3 that only the attitudes presented with regard to section 3.1 and 3.5 are addressed.

No further mention is made regarding measures to mitigate impacts to resource users. There should be some indication as to what can be done to resolve the impacts.

Appendix D

Susitna Hydroelectric Project, Draft Exhibit E Volume 4, Chapter 7 Recreational Resources

GENERAL COMMENTS

This report segment lacks supportive data for many statements related to project impacts. Statements or discussions are often simplistic, based on faulty assumptions and methodologies; and lack the necessary definitions to provide adequate project impact analysis.

In general, analysis of current trends in recreational boating and fishing in Upper Cook Inlet, leads to the conclusion that many of the recreational use projections in this report are far too conservative.

Discussion of project impacts in some instances is limited only to statements that anticipated impacts are similar to others discussed, or to other impoundment projects. The specific comments that follow will demonstrate many of these deficiencies.

SPECIFIC COMMENTS

Page/Paragraph

E-7-13/2

Fairbanks is not considered to be within the Southcentral area of Alaska.

E-7-13/3

The paragraph implies members of the Knik Kanoers and Kayakers are representative of the overall increase in recreational boating within the Susitna River basin. They are not, as they comprise only a minor segment of the recreational boating users. Substantially greater increase in boating, and water oriented recreation with other types of watercraft has occurred.

E-7-15/3

Lake Susitna, Tyone Lake and Tyone River are already major recreation areas. They are not potential areas for "future development" as stated in the text. Both Lake Susitna and Tyone Lake have numerous recreational cabins located around their perimeters.

Boaters are not able to float down the Susitna River and up to Lake Louise as stated. Powered watercraft are necessary (often equipped with jet or air-drive propulsion) to ascend the Tyone River, to Tyone Lake.

E-7-20/1

We are not aware of any recreational boaters traveling upstream on the Talkeetna River to Stephen Lake for fishing, due both to the distance and presence of major rapids on the Talkeetna River.

E-7-21/2

See comment (E-7-20/1)

E-7-24/2

Management of lands for public recreation and appreciation as presented in the paragraph requires additional clarification. It is not clear what will be accomplished to achieve these goals.

E-7-25/1

This paragraph refers primarily to wildlife related impacts, and little mention is made of potential fisheries impacts. In addition to quarry activities discussed for Tsusena Creek, it can be anticipated that the lower reaches of all Susitna River tributaries within the impoundment may be effected by vegetative clearing, road construction, gravel removal, as well as the stated water quality changes.

Paragraph one also implies the actual construction area is a relatively minor one. It in fact will be almost 50 miles in length, and one which does not constitute only a minor inconvenience to recreational users.

E-7-25/2

As in the previous paragraph the discussion is directed primarily to wildlife and wildlife related impacts. The discussion fails to address the fact that the lower reaches of all clear water tributaries to the Susitna River, within the impoundment, will be inundated. These areas are the most valued aquatic habitats at present, and are the areas where all recreational use currently occurs.

E-7-25/5

This paragraph does not clarify why fish populations are not expected to occur in the impoundment. Statements in Chapter 3 (fish, wildlife & botanical resources) indicate the impoundment waters are expected to provide additional fisheries habitat.

The apparent inconsistency in these statements, and report segments, requires clarification.

E-7-25/6

This paragraph is unclear as to locations of areas where sport fishing will be disturbed. Dredging reference is to "channel" but does not clarify if it is within the Susitna River or the tributaries where sport fishing currently occurs.

Additionally, dredging may create impacts other than just changes in water quality as stated. Quarry activities, road construction and resultant recreational use restrictions as a result of these activities are not discussed.

E-7-26/1

The flows predicted during the fill period will not only "temporarily diminish" fishing opportunities as stated, but will totally eliminate some of the slough and side channel habitats. The effects of slough dewatering during the fill period may result in the loss of several year classes of some species of fish, creating not a temporary impact, but a "long-term" one.

E-7-26/2

There is no information to support the statement of increased fishing opportunities with increased winter turbidity levels as stated.

E-7-28/1

No data exist to support the statement that the presence of construction workers will not have detrimental effects to the recreational resources, nor is there an adequate discussion of what constitutes "proper control."

E-7-28/2-3

References to the impacts of 550 workers, the loss of 32 miles of river, construction of a 34-mile road, and current uses of the river are treated superficially. Impacts to recreational resources resulting from improved road access alone will affect not only waters within the impoundment but those of adjacent areas as well.

E-7-29/3

This paragraph is speculative. No data are presented to support the statement that winter fishing is unaffected by increased turbidity levels. The increase in turbidity levels requires definition.

E-7-30/3

No data are presented to support the assumption that recreational use is non-specific to the area, and can simply be moved to adjoining areas. A definition of subject species and recreational uses discussed is required.

E-7-37/4

Data extracted from the 1970 report should not be used when similar data from the 1976 and 1981 reports are available. Existing ADF&G data suggest that per capita participation days and projected increases as published in the 1970 plan, and for demand estimation, are inappropriate for 1980 and 2000.

E-7-38/1

Quality is not the same for all activities and should not be discussed as though it were. The assumption that travel time and cost totally influences recreational use is faulty.

E-7-39/4

Data in this paragraph are interpreted incorrectly. A careful review of the evidence cited does not suggest that fishing effort has been decreasing in the impact area, or even that it has decreased relative to statewide trends. Areas used for yearly comparisons do not represent the impact areas. In addition, areas used for comparison were not the same from year to year.

E-7-40/4

No data are presented in this paragraph to support the assumption of a declining recreational demand in the Susitna River area. The

discussion does not define the other "attraction values," nor does it address the increasing recreational needs of an increasing human population in the railbelt area.

E-7-41/4

The doubling of recreational use as presented is considered conservative. With the addition of a road system into the upper Susitna River area and the expanding human population, greater increases are expected to occur.

E-7-41/6

With the decreased flows downstream from Devil Canyon dam, and improved road access to the dam site, we would expect increased days of recreational use by kayakers, canoers and rafters.

Appendix E

Susitna Hydroelectric Project Draft Exhibit E Volume 4, Chapter 9 Land Use

GENERAL COMMENTS

This document is written in such a general manner that it is difficult to comment on. It contains information that contradicts statements made in other chapters, and ignores potential impacts to land use and access downstream from Gold Creek.

Although mitigation of impacts to land use is mentioned, there is no commitment to implementing possible measures. In addition, there is no discussion of which measures will be implemented or when or how. Some impacts to land users are completely glossed over and it is suggested that users will have to accept impacts or move elsewhere.

SPECIFIC COMMENTS

Page/Paragraph

E-9-2/7

Activities such as consumptive, recreational or subsistence use of fish and and wildlife resources are considered as dispersed use and isolated non-site-specific activities which do not involve a commitment of resources at any particular site.

Harvest, and production of harvestable resources is specifically dependant on a commitment of a specific amount of land (habitat). Participation in the harvest of fish and game (levels of effort) is therefore site-specific. Consequently, the loss of species habitat including the lands and waters used as harvest areas will have a measurable impact both on management of wildlife and on public use.

E-9-3/5

An assumption is made that because the project is isolated and located in a subarctic environment, extremely low density land use results. However, use of land both by the public and wildlife is seasonal and can be very high for a specific season.

E-9-15/3

Hunting use of Zone 1 is less than in Zones 2 and 3. However, hunting in Zones 2 and 3 is basically associated with the existing lodges and cabins and is more readily quantifiable than identifying independent hunter effort. Use of ADF&G harvest statistics would help quantify independent hunter effort.

Figure E.9.5

Reference to rating public use of lands occurs throughout Chapter 9 and is ultimately reflected in Figure E.9.5 a map which identifies 11 use or sample use sites with evaluations of use intensities for each site.

The designation of Low, Medium and High intensity uses should be defined.

E-9-32/1

Proposed mitigation for the loss of public use of project lands has only addressed the consideration of establishing restrictive access regulations. Other mitigation alternatives should be identified including replacing opportunities lost with lands that provide equal value.

Z

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

COMMISSIONER'S OFFICE

✓ 02-23-12.02
02-23-13.03
Bill Sheffield, Governor

ESTES ✓

P.O. BOX 3-2000
JUNEAU, ALASKA 99802
Phone: (907) 465-4100

February 7, 1983

ADF&G

Respon

Mr. Gerald L. Wilkerson, CPA
Legislative Auditor
Division of Legislative Audit
Pouch W
Juneau, Alaska 99811

Dear Mr. Wilkerson:

The Alaska Department of Fish and Game (DFG) has reviewed the Special Report on the Department of Fish and Game Susitna River Hydroelectric Project for the fiscal years ending June 30, 1982, 1981 and 1980 prepared by the Division of Legislative Audit. Our comments follow.

Page 3

PLAN OF STUDY - Department of Fish and Game (DFG)

It is correctly stated that the DFG proposed that the aquatic research studies be conducted through five years in November 1979. However, it should also be added that the concept of phasing written into our November 1979 proposal was based on the approach which had been established by the APA for the engineering feasibility studies prior to our November 1979 Plan of Study (POS) development. It should also be noted that the five-year approach was originally submitted to the APA by the DFG in December 1977.

Page 4

CONTRACT AND PLAN OF STUDY - Acres American, Inc.

First paragraph, last line

It should be stated that even with the accelerated purchase warning by DFG in their POS of 1979, critical equipment and personnel needs required by DFG could not be acquired in time to meet 1980 implementation of the Anadromous Adult Project. It was for this reason that DFG in their June 1980 RSA program statement had planned on implementation of that project in 1981.

It should also be noted that studies on wild biological populations can only be accomplished when the species are present. The Acres Plan of Study, February 1980 schedule for the DFG program was out of place with biological reality. For example, six Side Scan Sonar units ordered by Acres did not arrive on

STATE OF ALASKA

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February 7, 1983

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site until late August 1980, well past the time they could have been put to effective use (See Enclosure A, November 18, 1982).

Page 7

POSTPONEMENT OF FERC LICENSE SUBMISSION

We fully agree with the APA that the Federal Energy Regulation Commission (FERC) license submission would be more acceptable with two complete years of data to report but more importantly we believe the FERC will want an analysis of that data. After our FY 83 negotiations, APA agreed that DFG should begin analysis of pre-project baseline conditions related to fish and their habitats commencing with the 1982 data. Two other contractors were also assigned to this task, the Arctic Information and Data Center (AEIDC) and Woodward-Clyde. The AEIDC is responsible for the 1974-81 pre-project and 1982 post-project impact assessment and analysis and Woodward-Clyde Consultants, Inc. is responsible for Exhibit E preparation which includes evaluation of mitigation alternatives and their feasibility. The combined analyses will provide an assessment of post-project fisheries and habitat impacts, and provide for the mitigation alternatives necessary for the required submission to FERC.

We are concerned that APA has altered their recognition of the complexity of the various steps and time required by the various Aquatic Study contractors, including DFG, to provide data analysis. The reality is that the analysis of fisheries and habitat data must proceed in a time frame well beyond the FERC license submittal date. This was specifically agreed to by the APA, its prime contractor Acres, AEIDC, and other state and federal agencies monitoring the feasibility process. Please refer to my November 18, 1982, comments to your agency on this topic and the October 19, 1982, letter (Enclosure B) to Kent Wohl of the U.S. Fish and Wildlife Service from my staff.

A copy of our report schedule in the FY 1983 DFG - APA Aquatic Studies RSA is also included for your reference (Enclosure C). As you will note our late January submission to APA and the other Aquatic Study contractors is a draft internal review and a data transmittal document. The analysis of pre-project conditions from DFG will be submitted on June 30, 1983.

We also question your statement that APA had to delay their license application submittal because of insufficient fisheries data. Please note pages two through six of our November 18, 1982, letter to the Division of Legislative Audit where we previously addressed this issue. The DFG in fact has not delayed submittal of the FERC license application. Rather it is the time frame artificially established by the APA that they knew

contradicted the advice of the DFG and other agencies which makes it appear as though the studies were the cause for delay.

APA's EVALUATION OF ENVIRONMENTAL STUDIES

Information must be collected, analyzed, and transmitted in a timely fashion to insure that potential project impacts are adequately identified. When this project is determined economically feasible, we must insure that mitigation of impacts on fish, wildlife and their habitats will be incorporated as a part of the project design, construction, operation, and management as required by federal law. It is our contention that the study issues and licensing schedule problems APA is experiencing would have been minimized today if this Department's advice and attempts at coordination had received adequate consideration.

Enclosure D identifies a source of delay other than the scheduling and study implementation constraints we have experienced, this Department has been extremely sensitive to the fact that any delay, regardless of the project's technical feasibility, could affect its economic feasibility.

We emphasize that DFG's February reports are review and data transfer documents. Their submission to APA by that date will not enable AEIDC to perform an analysis and for Woodward-Clyde Consultants to incorporate the material in the Exhibit E being submitted to FERC in mid-February. FERC has given an accommodation to the APA which will allow supplemental submittals of data and analysis documents to September of 1983. DFG expects to meet the schedule outlined in our RSA with APA through June 30.

FINDINGS AND RECOMMENDATIONS

Recommendation No. 1

The comments on Parts 1 through 3 of this recommendation follow:

1. Accurately identify in advance the objectives and scope for each year's program.

The objectives of the DFG November 1979 POS are as viable today as when they were originally proposed in 1977. The minimum five-year time frame we recommended in the 1979 POS to accomplish these objectives is still valid. However, it should be pointed out that of the six objectives in the DFG November 1979 POS, only three were funded by APA. The remaining three objectives have had little attention and tasks related to these objectives were not assigned to DFG by APA for further resolution. The first three objectives

on page 13 of the DFG November 1979 POS, (Enclosure E) are the ones the DFG is pursuing.

An example of our recognition of the required scope of study is found in our proposed studies on access and transmission corridors in the FY 83 program related to fisheries. These studies were not funded by APA. Subsequently, in the list of Deficiencies in the Draft Exhibit E Application prepared by the FERC dated November 21, 1982, they identified the lack of information on access and transmission corridors as one of two general deficiencies in the Draft Exhibit E. This aspect of needed studies was also treated in our November 1979 POS.

DFG has identified the aquatic study program objectives including the general and specific scope of studies which should be executed prior to submitting the license application to the FERC. However, neither Acres' February 1980 POS, nor subsequent State budget appropriations for the project have been funded based on DFG's expected program recommendations. Budget levels were established by the APA without our input and our program was negotiated subsequent to the funding appropriation received by APA. This process leads to inadequate funding to conduct needed programs regardless of whether the objectives and scoping proposed by DFG are accurate. This deficiency in operations falls outside the authorities of this Department.

The cycle has been established on reporting procedures and time duration for studies. Until this year the process has been for schedules to be drafted by the APA for completion of work on the assumption that the DFG can accommodate them regardless of the time requirements associated with the biological timing of data collection and analysis. Prior and not after-the-fact consultation on schedules is required. Every effort has been made to expedite early transmittals of provisional data to Woodward-Clyde [refer to August 19, 1982, letter (Enclosure F) and (Enclosure G)].

2. Identify the administrative realities which can delay the Aquatic Research Study's progress and aggressively work to resolve them.

The DFG has continually identified administrative realities and constraints from the inception of the Su-Hydro Project. However, many of the constraints we have identified have at times been ignored. Where APA and DFG have direct control over administrative constraints problems have been resolved to our mutual satisfaction.

The matter of timely creation of positions through the State personnel process is a constraint which can, and does go beyond the direct control of the APA and DFG. Resolution of this problem may require prioritization by the State Administration and Legislature for the APA and DFG to receive favored treatment in position classification and staffing if project objectives are to be met. During the FY 83 field season, DFG/Su-Hydro made short term borrows of several positions available within the Department as well as using college students under the Western Interstate Commission for Higher Education (WICHE) program to initiate field work until Su-Hydro positions were processed. However, several positions in specialist categories could not be accommodated in this manner.

3. Develop plans to ensure that the biological data collected by the Aquatic Research Study during the summer of 1982 is submitted with the FERC license application in February 1983.

As stated previously, the data which is being reported in the late January and February time frame will be, in accordance with the APA-DFG RSA; a draft form product for internal review to be used to initiate an integrated analysis process by the DFG, AEIDC, and Woodward-Clyde Consultants. It should be stressed that having the field data in a form where it is reduced and useable for analysis does not mean it is useful for inclusion in the FERC license submittal. The meaningful information is the analysis which identifies the feasible mitigation alternatives to offset undiversable project impacts. However, the decisions on the ultimate disposition and release of data in any form from the DFG study products is the APA's to make. However, we hope that the constraints on its use is an area where the APA will consult with DFG. Misuse or misinterpretation of our data due to haste in its transmittal could create problems at a later date which can cause further delays.

DFG is also contributing a substantial amount of data on the physical processes and conditions in the Susitna River. The data is required by other study groups evaluating water quality, stream hydrology impacts, and project operational flow scenarios. Therefore, in September we began transferring several early drafts of biological and physical parameters as provisional data summarized in non-report form to other contractors for their use.

The last paragraph of this section states that DFG early in the program suggested that: the "biology of all potential impact areas be researched in depth." This is not the case as our program has always emphasized the need to first

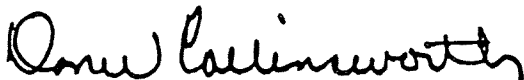
February 7, 1983

assess baseline physical habitat conditions in areas potentially impacted by the project. A knowledge of these conditions is essential to the understanding of the impacts of the proposed Su-Hydro Project on fish and their habitats. We must understand the relationships between the biological, physical, and chemical components of the environment. To conduct studies of biological and physical factors out of the same temporal sequence would not provide the data to support analysis of project impacts on fish and their habitats. These studies must be concurrent to be meaningful. Our study plans to date have given balance to the study of both the biological and physical components of the Susitna River aquatic environment. Indeed, the view in this paragraph attributed to APA, that the "APA believed that the Aquatic Research Study should first identify potential physical changes caused by the project" is contradictory to what we have observed in program scoping discussions. The Instream Flow and Aquatic Habitat (AH) Project which is charged with the collection of data to formulate such observations has consistently been the project element which APA has shown the most reluctance to fund. In the FY 83 program we had substantial growth in this program element and basically doubled our staff levels as APA came to realize the importance of collecting physical habitat information.

With regard to the statements on page 10, last paragraph, we refer you to our comments on this matter shown on page six of our November 18, 1982, letter to the Division of Legislative Audit.

Thank you for the opportunity to comment on the preliminary audit report. If there are any further questions we will be pleased to respond.

Sincerely,



Don W. Collinsworth
Acting Commissioner

Enclosures

AA

02-83-13.03 ^{AA-}
ESTES ✓

A SPECIAL REPORT ON THE
DEPARTMENT OF FISH AND GAME
SUSITNA RIVER HYDROELECTRIC PROJECT
For the Fiscal Years Ended
June 30, 1982, 1981 and 1980
Audit Control Number

11-4136-83-S

Audit
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background
materials

RECEIVED

APR 2 1983

Alaska Dept. of Fish & Game
Sport Fish/Susitna Hydro

Commissioner, Department
of Fish and Game

Don Collinsworth

Deputy Commissioners, Department
of Fish and Game:

Resource Management
Program Management

Vacant
Vacant

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ESTES ✓

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PURPOSE OF THE REPORT

In accordance with a Legislative Budget and Audit Committee request and Title 24 of the Alaska Statutes, this special report has been prepared on the Department of Fish and Game's performance in the Susitna River Hydroelectric Project to determine:

1. The current status of the Department of Fish and Game's research for the Susitna River Hydroelectric Project.
2. If the Department is accomplishing the Project's goals and objectives previously established.
3. The Alaska Power Authority's impression of the Department's performance in the Project.
4. If the Project expenditures incurred by the Department are appropriate and reasonable.

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BACKGROUND INFORMATION

PURPOSE

The purpose of the Susitna River Hydroelectric Project is to develop a plan to generate and transmit electrical power which will:

1. Minimize the cost of electrical power in the market areas.
2. Minimize adverse environmental and social impacts while enhancing environmental values.
3. Safeguard life and property.

The current plans propose construction of two dams on the upper Susitna River at Devil Canyon and Watana.

The Alaska Power Authority (APA) in the Department of Commerce and Economic Development (DCED) are responsible for planning and supervising the Susitna River Hydroelectric Project.

PLAN OF STUDY - Department of Fish and Game (DFG)

In November 1979, DFG presented to APA a Plan of Study for researching the environmental impacts of the Susitna River Hydroelectric Project. DFG listed two research studies in the Plan of Study.

1. The Aquatic Research Study would collect and analyze data about the fishery and aquatic habitat resources in the Susitna River. DFG proposed a \$4 million budget to complete the first two years of the Aquatic Research Study.
- ~~2. The Terrestrial Research Study would collect and analyze data about the big game populations in the Susitna River Basin. DFG proposed a \$1.3 million budget to complete the first two years of study.~~

DFG proposed that both research studies would be completed in two phases and take five years. The objective of Phase I is to collect enough biological information to support a license application to the Federal Energy Regulatory Commission (FERC). The information would also be used by another contractor to develop mitigation measures for offsetting potentially harmful environmental impacts of the Susitna River Hydroelectric Project. The mitigation measures will also be used in the FERC license. Phase I will collect two years of research data.

Phase II research studies will continue the field investigations initiated during Phase I. Biological data from Phase II would be used as supplementary information to help process the FERC application. Phase II is to be conducted for three years after Phase I is completed.

Also, in the Plan of Study, DFG warned that the Aquatic Research Study could be delayed because of the lengthy time it took to obtain equipment and qualified personnel through the State personnel and purchase systems. In order to avoid the delay, DFG suggested that the equipment should be ordered well in advance of the field work. DFG also suggested that they could obtain their personnel in a timely manner if APA quickly released the funds for the Aquatic Research Study.

CONTRACT AND PLAN OF STUDY - Acres American, Inc.

On December 19, 1979, APA contracted with Acres American, Inc. to provide engineering and technical services and coordinate the environmental and other studies involved in the Susitna Project. All the studies would be used in the FERC application if the Legislature concurs that the Susitna River Hydroelectric Project should be constructed. Another responsibility for Acres American, Inc. was to purchase equipment for APA to be used by DFG in the Aquatic Research Study. The reason for this responsibility was to develop an efficient system to purchase needed equipment in a timely manner. After the Acres American, Inc. contract was signed, APA had Acres American, Inc. begin ordering equipment for DFG to use in the Aquatic Research Study.

Acres American, Inc. presented a Plan of Study to APA in February 1980, which was released to the public. The February 1980 Plan of Study proposed that the FERC application would be submitted by June 30, 1982 and would include two years of biological data collected by DFG's Aquatic and Terrestrial Research Studies. The Plan also proposed budgets totalling \$1.4 million and \$1.3 million for the Aquatic and Terrestrial Research Studies. APA accepted Acres American, Inc.'s Plan of Study.

REIMBURSABLE SERVICE AGREEMENTS (RSA) - DFG

In February 1980, APA and DFG signed a RSA (interagency contract) to begin the Terrestrial Research Study. The RSA established that Phase I of the Terrestrial Research Study was to be completed in two years with a budget of \$1.3 million. Phase II is to be budgeted and negotiated at a later date.

The RSA to begin the Aquatic research Studies took several months to negotiate. Because of differences in approaches

to the Study, APA and DFG did not sign the RSA's for the Aquatic Research Studies until June 1980 (see Recommendation No. 1). The RSA's however, stated that most of the research for Phase I of the Study would be done in the summer of 1981 and would be finished by June, 1982. The RSA's established a budget of \$1.7 million for the Division of Commercial Fish and Division of Sport Fish to complete Phase I of the Aquatic Research Study.

ACQUISITION OF PERSONNEL - DFG

After the RSA for the Aquatic Study was signed in June, 1980, DFG placed the requests to obtain new positions. As DFG predicted in their Plan of Study, (see PLAN OF STUDY - DFG, page 3), they were not able to get their requests for new positions processed and approved until October 1980. This was too late for DFG to begin their research for the summer of 1980 (see Recommendation No. 1).

PRELIMINARY FEASIBILITY REPORTS - APA

In March 1981, APA presented a report to the Governor and Legislature recommending that work should continue on the Susitna River Hydroelectric Project. The report however, did note that little environmental information had been collected on the aquatic habitat of the Susitna River Hydroelectric Project due to a late start in DFG field investigations.

In April 1982, APA presented a second feasibility report to the Governor and Legislature. This report also recommended that work on the Susitna River Hydroelectric Project should continue. The report contained information included in Phase I reports submitted by the Aquatic Research Study and the Terrestrial Research Study. The Terrestrial Research Study Phase I reports had 1980 and 1981 research data. The Aquatic Research Study reports contained only information collected during the period from October, 1980 through October, 1981.

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CURRENT STATUS OF THE PROJECT

POSTPONEMENT OF FERC LICENSE SUBMISSION

Because the Aquatic Research Study contained only one year of research data by June 1982 and not two years, APA has extended Phase I work to include the summer research work of 1982. APA has also postponed the date for submitting the FERC license application from July 1982 to February 1983. One of the reasons for the postponement is to obtain more data from the Aquatic Research Study (see Recommendation No. 1). APA believes that the application will be more acceptable to FERC if it contains two years of collected data concerning the aquatic environment.

APA'S EVALUATION OF ENVIRONMENTAL STUDIES

APA has told us that the data collected by DFG and reported in the Phase I studies is comprehensive and useful in evaluating the environmental impacts of the Susitna River Hydroelectric Project. APA has expressed concern, however, as to whether the Aquatic Research Study will have the summer of 1982 data analyzed and summarized in a report by the proposed FERC application date (see Recommendation No. 1). DFG has told us that they plan to have the studies completed and the report written by February, 1983 and are currently on schedule. They believe that if their report is delayed, that it will not affect the submission of the FERC license. They believe that they can submit their report after the FERC license application has already been submitted.

DFG'S EXPENSES FOR THE RESEARCH STUDIES

As of June 30, 1982, the Division of Game has spent \$1,703,778 on the Terrestrial Research Study and the Division of Sport Fish and Division of Commercial Fisheries have collectively spent \$2,381,345 on the Aquatic Research Study. (see Statement of Authorization and Expenditures on page). Also \$742,200 of equipment has been purchased for the Aquatic Studies by APA and Acres American, Inc. Other services, including lease space for offices and storing equipment, have been provided by APA and Acres American, Inc. These services have totalled \$164,000 (see Notes to the Financial Statements, Note 3 on page 15). We found these expenditures to be appropriate and reasonable.

OTHER INFORMATION

The contract for Acres American Inc. has totalled to over \$40 million and is to be terminated in March 1983. A joint

venture, Harza-Ebasco, has been hired to replace Acres American Inc. for Phase II of the Susitna River Hydroelectric Project. APA and DFG expect to conduct research on the Terrestrial and Aquatic research Studies for Phase II of the Project another two or three years after the FERC license application has been submitted.

FINDINGS AND RECOMMENDATIONS

Recommendation No. 1

In order to better plan and coordinate the activities in the Aquatic Research Study of the Susitna River Hydroelectric Project, the APA and the DFG should:

1. Accurately identify in advance the objectives and scope for each year's program.
2. Identify the administrative realities which can delay the Aquatic Research Study's progress and aggressively work to resolve them.
3. Develop plans to ensure that the biological data collected by the Aquatic Research Study during the summer of 1982 is submitted with the FERC license application on February 1983.

The Aquatic Research Study is being conducted by DFG to provide a resource base for evaluating the environmental impacts of the proposed Susitna River dams. In addition, data collected in the Study will supplement information from other studies for the Susitna dam license application sent to the FERC. Delays in the Aquatic Research Study could delay the Susitna River Hydroelectric Project, resulting in higher costs because of inflation.

In our review of the performance of the Aquatic Research Study, we found that the Study's progress is almost a year behind schedule of the Acres American, Inc. 1980, Plan of Study, issued in February, 1980. The delayed progress is one of the reasons why APA decided to postpone the date for submitting the FERC license from July 1982 to February 1983.

At the beginning of the Susitna River Hydroelectric Project, APA should have accurately identified the objectives, scope and time requirements for the Aquatic Research Study. This may have prevented the lengthy negotiations that took place before the first reimbursable service agreements were signed by APA and DFG (see Background Information, REIMBURSABLE SERVICE AGREEMENTS, page 4). DFG basically believed that the general approach of the Aquatic Research Study should be to assume there would be substantial impacts by the Susitna River Hydroelectric Project up and down the Susitna River. The Aquatic Research Study should then begin researching the biology of all potential impact areas in depth. On the other hand, APA believed that the Aquatic Research Study should first identify potential physical changes caused by the Project, determine which impacts were important for the acceptance of the project and only then intensify the study of the biological relationships. Because of these differences in

opinion, it took several months for APA and DFG to agree on the scope of the Aquatic Research Study.

The delay in the Aquatic Research Study also may have been avoided if APA had realized the administrative realities that it takes a department several months to obtain new employees. Then both APA and DFG should have aggressively worked to avoid the delay which postponed DFG's field research to the late fall of 1980. If DFG had begun their field research in the summer of 1980, the Aquatic Research Study may have completed it's second year of research on schedule (See Background Information, REIMBURSABLE SERVICE AGREEMENTS (RSA) - DFG, page 4).

APA and DFG have not had previous experience with projects as large and complex as the Susitna River Hydroelectric Project and the Aquatic Research Study. Because of these facts, detailed planning will provide better guidance for the Aquatic Research Study. APA has already instituted several steps which we believe will help improve the planning and coordination of the Aquatic Research Study. However, there has been concern expressed about whether the data collected by the Aquatic Research Study will be available in a timely manner for the FERC application. We suggest that APA and DFG meet to identify the potential problems which might delay the timely transfer of data and develop plans to solve them.

STATE OF ALASKA

THE LEGISLATURE

BUDGET AND AUDIT COMMITTEE

AUDIT DIVISION
POUCH W
JUNEAU, ALASKA 99811

November 1, 1982

Members of the
Legislative Budget and Audit Committee:

We have examined the Statement of Authorizations and Expenditures for the State of Alaska, Department of Fish and Game, Susitna River Hydroelectric Project, for the Fiscal Years Ended June 30, 1982, 1981, and 1980. Our examination was made in accordance with generally accepted auditing standards and accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

The policy of the State of Alaska is to prepare its financial statements on the basis of accounting described in Note 1. Accordingly, the accompanying financial statement is not intended to present financial position and results of operation in conformity with generally accepted accounting principles.

In our opinion, the Statement of Authorizations and Expenditures presents fairly the authorization, expenditures and closing balances of the State of Alaska, Department of Fish and Game, Susitna River Hydroelectric Project, for the Fiscal Years Ended June 30, 1982, 1981, and, 1980, on a basis of accounting as described in Note 1.

Sincerely,



Gerald L. Wilkerson, CPA
Legislative Auditor
Division of Legislative Audit

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STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
SUSITNA RIVER HYDROELECTRIC PROJECT
STATEMENT OF AUTHORIZATIONS AND EXPENDITURES
For the Fiscal Years Ended June 30, 1982, 1981, and 1980

Servicing Agency	Fiscal Year 1982- Fiscal Year 1980 Authorizations	Expenditures			Total Expenditures	Balances	
		Fiscal Year 1982	Fiscal Year 1981	Fiscal Year 1980		Continuing Programs	Lapsed
Division of Administration	\$ 50,600	\$ 33,287	\$ 017,313	\$ -0-	\$ 50,600	\$ 0	\$ 0
Division of Sport Fish	1,789,600	1,194,516	430,520	3,896	1,628,932	159,564	1,104
Division of Fisheries Rehabilitation, Enhancement, and Development	1,500	-0-	0	1,506	1,506	0	(6)
Division of Game	1,778,589	794,412	648,789	260,577	1,703,778	0	74,811
Division of Commercial Fish	870,500	619,941	132,472	-0-	752,413	118,087	0
Division of Habitat Protection	12,000	-0-	0	8,532	8,532	0	3,468
Total	<u>\$4,502,789</u>	<u>\$2,642,156</u>	<u>\$1,229,094</u>	<u>\$274,511</u>	<u>\$4,145,761</u>	<u>\$277,651</u>	<u>\$79,377</u>

The Notes to the Financial Statements are an integral part of this statement.

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STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
SUSITNA RIVER HYDROELECTRIC PROJECT
NOTES TO THE FINANCIAL STATEMENTS

For the Fiscal Years Ended June 30, 1982, 1981, and 1980

Note 1 - Summary of Significant Accounting Policies

The following is a summary of the significant policies of the State of Alaska applicable to the Department of Fish and Game, Susitna River Hydroelectric Project.

- A. Source of Funding. The Department of Fish and Game's involvement in the Susitna River Hydroelectric Project is funded through reimbursable service agreements with the Alaska Power Authority, Department of Commerce and Economic Development.
- B. Fund Accounting. The State of Alaska maintains its accounting in accordance with the principles of fund accounting. A fund is a fiscal and accounting entity established by law to segregate and account for designated resources and activities. The activities of the funding sources described above are in the General Fund.
- C. Basis of Accounting. The financial statement for Department of Fish and Game, Susitna River Hydroelectric Project is reported on the accrual basis of accounting.

Note 2

The Division of Sport Fish, Division of Commercial Fisheries, and the Division of Game have received additional funding from the Alaska Power Authority to continue their research in Fiscal Year 1983. They received from the Alaska Power Authority reimbursable service agreements for \$2,771,500, \$757,100 and \$1,032,000 respectively in July, 1982. This has increased the total funding for the Department of Fish and Game's involvement in the Susitna River Hydroelectric Project to \$9,063,389.

Note 3

The Department of Fish and Game has been utilizing equipment, clerical services, and lease space for personnel and equipment provided by the Alaska Power Authority and Acres American, Inc. Up to July, 1982, the amount of equipment purchased for the Department of Fish and Game's use is \$742,204. Other services, including leases, have totaled to \$164,000. These costs are in addition to those expenditures in the Statement of Authorization and Expenditures and account for \$906,200 of additional expenses.

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STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

COMMISSIONER'S OFFICE

Bill Sheffield, Governor

P.O. BOX 3-2000
JUNEAU, ALASKA 99802
Phone: (907) 465-4100

February 7, 1983

RECEIVED
FEB 08 1983

LEGISLATIVE
AUDIT

Mr. Gerald L. Wilkerson, CPA
Legislative Auditor
Division of Legislative Audit
Pouch W
Juneau, Alaska 99811

Dear Mr. Wilkerson:

The Alaska Department of Fish and Game (DFG) has reviewed the Special Report on the Department of Fish and Game Susitna River Hydroelectric Project for the fiscal years ending June 30, 1982, 1981 and 1980 prepared by the Division of Legislative Audit. Our comments follow.

Page 3

PLAN OF STUDY - Department of Fish and Game (DFG)

It is correctly stated that the DFG proposed that the aquatic research studies be conducted through five years in November 1979. However, it should also be added that the concept of phasing written into our November 1979 proposal was based on the approach which had been established by the APA for the engineering feasibility studies prior to our November 1979 Plan of Study (POS) development. It should also be noted that the five-year approach was originally submitted to the APA by the DFG in December 1977.

Page 4

CONTRACT AND PLAN OF STUDY - Acres American, Inc.

First paragraph, last line

It should be stated that even with the accelerated purchase warning by DFG in their POS of 1979, critical equipment and personnel needs required by DFG could not be acquired in time to meet 1980 implementation of the Anadromous Adult Project. It was for this reason that DFG in their June 1980 RSA program statement had planned on implementation of that project in 1981.

It should also be noted that studies on wild biological populations can only be accomplished when the species are present. The Acres Plan of Study, February 1980 schedule for the DFG program was out of place with biological reality. For example, six Side Scan Sonar units ordered by Acres did not arrive on

site until late August 1980, well past the time they could have been put to effective use (See Enclosure A, November 18, 1982).

Page 7

POSTPONEMENT OF FERC LICENSE SUBMISSION

We fully agree with the APA that the Federal Energy Regulation Commission (FERC) license submission would be more acceptable with two complete years of data to report but more importantly we believe the FERC will want an analysis of that data. After our FY 83 negotiations, APA agreed that DFG should begin analysis of pre-project baseline conditions related to fish and their habitats commencing with the 1982 data. Two other contractors were also assigned to this task, the Arctic Information and Data Center (AEIDC) and Woodward-Clyde. The AEIDC is responsible for the 1974-81 pre-project and 1982 post-project impact assessment and analysis and Woodward-Clyde Consultants, Inc. is responsible for Exhibit E preparation which includes evaluation of mitigation alternatives and their feasibility. The combined analyses will provide an assessment of post-project fisheries and habitat impacts, and provide for the mitigation alternatives necessary for the required submission to FERC.

We are concerned that APA has altered their recognition of the complexity of the various steps and time required by the various Aquatic Study contractors, including DFG, to provide data analysis. The reality is that the analysis of fisheries and habitat data must proceed in a time frame well beyond the FERC license submittal date. This was specifically agreed to by the APA, its prime contractor Acres, AEIDC, and other state and federal agencies monitoring the feasibility process. Please refer to my November 18, 1982, comments to your agency on this topic and the October 19, 1982, letter (Enclosure B) to Kent Wohl of the U.S. Fish and Wildlife Service from my staff.

A copy of our report schedule in the FY 1983 DFG - APA Aquatic Studies RSA is also included for your reference (Enclosure C). As you will note our late January submission to APA and the other Aquatic Study contractors is a draft internal review and a data transmittal document. The analysis of pre-project conditions from DFG will be submitted on June 30, 1983.

We also question your statement that APA had to delay their license application submittal because of insufficient fisheries data. Please note pages two through six of our November 18, 1982, letter to the Division of Legislative Audit where we previously addressed this issue. The DFG in fact has not delayed submittal of the FERC license application. Rather it is the time frame artificially established by the APA that they knew

contradicted the advice of the DFG and other agencies which makes it appear as though the studies were the cause for delay.

APA's EVALUATION OF ENVIRONMENTAL STUDIES

Information must be collected, analyzed, and transmitted in a timely fashion to insure that potential project impacts are adequately identified. When this project is determined economically feasible, we must insure that mitigation of impacts on fish, wildlife and their habitats will be incorporated as a part of the project design, construction, operation, and management as required by federal law. It is our contention that the study issues and licensing schedule problems APA is experiencing would have been minimized today if this Department's advice and attempts at coordination had received adequate consideration.

Enclosure D identifies a source of delay other than the scheduling and study implementation constraints we have experienced, this Department has been extremely sensitive to the fact that any delay, regardless of the project's technical feasibility, could affect its economic feasibility.

We emphasize that DFG's February reports are review and data transfer documents. Their submission to APA by that date will not enable AEIDC to perform an analysis and for Woodward-Clyde Consultants to incorporate the material in the Exhibit E being submitted to FERC in mid-February. FERC has given an accommodation to the APA which will allow supplemental submittals of data and analysis documents to September of 1983. DFG expects to meet the schedule outlined in our RSA with APA through June 30.

FINDINGS AND RECOMMENDATIONS

Recommendation No. 1

The comments on Parts 1 through 3 of this recommendation follow:

1. Accurately identify in advance the objectives and scope for each year's program.

The objectives of the DFG November 1979 POS are as viable today as when they were originally proposed in 1977. The minimum five-year time frame we recommended in the 1979 POS to accomplish these objectives is still valid. However, it should be pointed out that of the six objectives in the DFG November 1979 POS, only three were funded by APA. The remaining three objectives have had little attention and tasks related to these objectives were not assigned to DFG by APA for further resolution. The first three objectives

on page 13 of the DFG November 1979 POS, (Enclosure E) are the ones the DFG is pursuing.

An example of our recognition of the required scope of study is found in our proposed studies on access and transmission corridors in the FY 83 program related to fisheries. These studies were not funded by APA. Subsequently, in the list of Deficiencies in the Draft Exhibit E Application prepared by the FERC dated November 21, 1982, they identified the lack of information on access and transmission corridors as one of two general deficiencies in the Draft Exhibit E. This aspect of needed studies was also treated in our November 1979 POS.

DFG has identified the aquatic study program objectives including the general and specific scope of studies which should be executed prior to submitting the license application to the FERC. However, neither Acres' February 1980 POS, nor subsequent State budget appropriations for the project have been funded based on DFG's expected program recommendations. Budget levels were established by the APA without our input and our program was negotiated subsequent to the funding appropriation received by APA. This process leads to inadequate funding to conduct needed programs regardless of whether the objectives and scoping proposed by DFG are accurate. This deficiency in operations falls outside the authorities of this Department.

The cycle has been established on reporting procedures and time duration for studies. Until this year the process has been for schedules to be drafted by the APA for completion of work on the assumption that the DFG can accommodate them regardless of the time requirements associated with the biological timing of data collection and analysis. Prior and not after-the-fact consultation on schedules is required. Every effort has been made to expedite early transmittals of provisional data to Woodward-Clyde [refer to August 19, 1982, letter (Enclosure F) and (Enclosure G)].

2. Identify the administrative realities which can delay the Aquatic Research Study's progress and aggressively work to resolve them.

The DFG has continually identified administrative realities and constraints from the inception of the Su-Hydro Project. However, many of the constraints we have identified have at times been ignored. Where APA and DFG have direct control over administrative constraints problems have been resolved to our mutual satisfaction.

The matter of timely creation of positions through the State personnel process is a constraint which can, and does go beyond the direct control of the APA and DFG. Resolution of this problem may require prioritization by the State Administration and Legislature for the APA and DFG to receive favored treatment in position classification and staffing if project objectives are to be met. During the FY 83 field season, DFG/Su-Hydro made short term borrows of several positions available within the Department as well as using college students under the Western Interstate Commission for Higher Education (WICHE) program to initiate field work until Su-Hydro positions were processed. However, several positions in specialist categories could not be accommodated in this manner.

3. Develop plans to ensure that the biological data collected by the Aquatic Research Study during the summer of 1982 is submitted with the FERC license application in February 1983.

As stated previously, the data which is being reported in the late January and February time frame will be, in accordance with the APA-DFG RSA; a draft form product for internal review to be used to initiate an integrated analysis process by the DFG, AEIDC, and Woodward-Clyde Consultants. It should be stressed that having the field data in a form where it is reduced and useable for analysis does not mean it is useful for inclusion in the FERC license submittal. The meaningful information is the analysis which identifies the feasible mitigation alternatives to offset undiversable project impacts. However, the decisions on the ultimate disposition and release of data in any form from the DFG study products is the APA's to make. However, we hope that the constraints on its use is an area where the APA will consult with DFG. Misuse or misinterpretation of our data due to haste in its transmittal could create problems at a later date which can cause further delays.

DFG is also contributing a substantial amount of data on the physical processes and conditions in the Susitna River. The data is required by other study groups evaluating water quality, stream hydrology impacts, and project operational flow scenarios. Therefore, in September we began transferring several early drafts of biological and physical parameters as provisional data summarized in non-report form to other contractors for their use.

The last paragraph of this section states that DFG early in the program suggested that: the "biology of all potential impact areas be researched in depth." This is not the case as our program has always emphasized the need to first

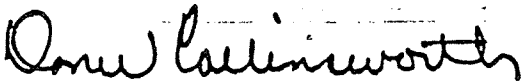
February 7, 1983

assess baseline physical habitat conditions in areas potentially impacted by the project. A knowledge of these conditions is essential to the understanding of the impacts of the proposed Su-Hydro Project on fish and their habitats. We must understand the relationships between the biological, physical, and chemical components of the environment. To conduct studies of biological and physical factors out of the same temporal sequence would not provide the data to support analysis of project impacts on fish and their habitats. These studies must be concurrent to be meaningful. Our study plans to date have given balance to the study of both the biological and physical components of the Susitna River aquatic environment. Indeed, the view in this paragraph attributed to APA, that the "APA believed that the Aquatic Research Study should first identify potential physical changes caused by the project" is contradictory to what we have observed in program scoping discussions. The Instream Flow and Aquatic Habitat (AH) Project which is charged with the collection of data to formulate such observations has consistently been the project element which APA has shown the most reluctance to fund. In the FY 83 program we had substantial growth in this program element and basically doubled our staff levels as APA came to realize the importance of collecting physical habitat information.

With regard to the statements on page 10, last paragraph, we refer you to our comments on this matter shown on page six of our November 18, 1982, letter to the Division of Legislative Audit.

Thank you for the opportunity to comment on the preliminary audit report. If there are any further questions we will be pleased to respond.

Sincerely,



Don W. Collinsworth
Acting Commissioner

Enclosures

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

OFFICE OF THE COMMISSIONER

02-82-13.02
JAY S. HAMMOND, GOVERNOR

P.O. BOX 3-2600
JUNEAU, ALASKA 99802
PHONE: 465-4100

November 18, 1982

Mr. Daniel A. Allen, CPA Auditor
Division of Legislative Audit
Pouch W
Juneau, Alaska 99811

Dear Mr. Allen:

The Alaska Department of Fish and Game (ADF&G) appreciates the opportunity to respond to your Interim Letter No. 1 of October 29, 1982, regarding your initial findings and recommendations on the ADF&G Susitna Hydro Aquatic Studies.

Your recommendation No. 1 regarding the Su Hydro Aquatic Studies states:

"The Alaska Power Authority (APA) and the Department of Fish and Game (DFG) should better plan and coordinate the tasks and activities of the Aquatic Research Study conducted for the Susitna Hydroelectric Dam Project."

We agree fully with this recommendation. However, some qualification or expansion of this recommendation is required. The ADF&G deserves greater recognition for our record of effort, concern and support for the coordination process which we have repeatedly expressed over the past eight years on the Su-Hydro project. Correspondence and attempts to coordinate all aspects related to fish and wildlife with the Corps of Engineers (COE) 1974-1978 and the APA are extensive. However, responses to our concerns and advice by both the COE and APA have been less than adequate. Please refer to my comments to the APA Board of Directors, April 16, 1982, enclosed.

This agency has done its best to assist in identifying the biological data needs, programs and schedules in order to comply with existing federal and State laws and regulations. The constraints placed on study scope, implementation and compliance with the Federal Energy Regulatory Commission (FERC) licensing process has not been of the Department's making, but APA's. The APA has often failed to heed the advice which this Department and other agencies have offered. These advices were based on both Federal and State requirements, which are designed to insure that fish and wildlife resources are not diminished. We fully recognize how important the timely presentation of the fish and wildlife information is to the Su-Hydro Project assessment.

November 18, 1982

This information must be collected, analyzed, and transmitted in a timely fashion to insure that potential project impacts are adequately identified. If the project is determined economically feasible, we must insure that mitigation of such impacts on fish, wildlife and their habitats will be incorporated as a part of the project design, construction, operation, and management as required by law. It is, therefore, our contention that the study issues and licensing schedule problems APA is experiencing would have been minimized or insignificant today if this Department's advice and attempts at coordination had received adequate consideration.

As you note in the last paragraph of the first page of your letter, "Delays in the Aquatic Studies can delay the Susitna Project and increase the total project cost because of inflation and higher interest costs." The subject of the source of these delays has been commented upon by ADF&G numerous times; for example, in a December 5, 1978, letter to APA, Executive Director, Eric Yould, we stated: "Although there is an aggressive effort to get the Phase I studies moving along the schedule proposed in the Susitna Hydro POS (Plan of Study), both the private and governmental sectors must recognize that the Susitna Hydro Project will still be subject to the requirements of Federal environmental law, particularly the National Environmental Policy Act and the Fish and Wildlife Coordination Act. Inadequate Phase I studies and failure to meet the standards of these laws and regulations for project feasibility can, and probably will, result in delays from litigation by preservationist and anti-development interests."

While the preceding comment speaks to a source of delay rather than the scheduling and study implementation constraints we have experienced, this Department has been extremely sensitive to the fact that any delay, regardless of the project's technical feasibility, could affect its economic feasibility. The December 5 letter to Mr. Yould is appended in its entirety for your information.

On page two of your letter you state:

"In our review of the performance of the Aquatic Study, we found that

1. The progress of the research study is almost a year behind schedule.
2. DFG's costs have exceeded the original cost estimates by \$900,000.
3. Equipment costs are \$300,000 over budget."

November 18, 1982

In the format presented, your statements could be taken out of context as a serious indictment of ADF&G's performance by a person who fails to read the qualifying points in your text which follows these statements. We therefore suggest you expand on the introductory statement to say, "In our review of the performance of the Aquatic Study in terms of the 1980 original proposed project scope," then follow each of three points directly with either a discussion or qualifications narrative concerning that point.

Our comments on point 1 are:

As you stated in the third paragraph, "In February 1980 Acres (Acres American) submitted a plan for conducting Phase I of the Susitna Project." "Acres plan proposed that the Aquatic Studies should begin in January 1980 and collect two years data for Phase I. The plan was accepted by APA and distributed to the public." If you are suggesting here that a year of aquatic studies, based on Acres and APA's February 1980 study plan, has been lost you are correct. According to their schedule, the aquatic studies were to begin in January 1980, one month before Acres came out with their 1980 plan. However, what is missing is the information that the 1980 aquatic studies plan which was actually approved for initiation by ADF&G is based on an RSA agreement with APA with funding to begin on July 1, 1980. Therefore, according to the plan actually agreed upon in June 1980 by ADF&G and APA, our participation was to begin on July 1, 1980 and not January 1980. It is important to note that at the same time that the agreement was signed, personnel classification documents were also submitted for processing according to State regulations. However, as you acknowledged in your letter, these funded ADF&G positions did not complete State processing until October of 1980. Even if these positions had been available sooner, the initial study period would still have been limited to the process of hiring staff and equipping, planning, and organizing the field phase of the program. Only a limited and reconnaissance level field activity could have been initiated during the open water season as discussed in our November 1979 Plan of Study and other supporting correspondence.

With the recognition that we did not have the approved staff positions, APA approached us in July and August of 1980 to ask if we could initiate an accelerated field program with increased funding. Though we advised APA that additional funding for such a program would not expedite the State process of acquiring personnel an RSA in the amount of \$218.0 was approved. We calculate that not more than five months of work was lost according to our June 1980 study plan and RSA. I hope it is evident that the Acres February 1980 study plan schedule was unrealistic, and that the ADF&G program and schedule actually agreed upon though dependent on timely staffing was essentially

November 18, 1982

on schedule. I hope it is recognized that we tried our best to compensate for these delays.

With regard to point 2; I would be interested in knowing the original source of the cost estimate overrun indicated at \$900,000? If it is the February 1980 Acres Study Plan it is an inappropriate reference due to the different time frames of execution of Phase I Studies and lack of consideration of the accelerated Phase I elements taken on by the Department from the Phase II request. Instead, our June 6, 1980 Plan of Study and RSA should have been referenced. According to that agreement, budget summary (enclosed), the estimated budget for the Phase I study (July 1, 1980 through December 31, 1981) and Phase II study (January 1, 1982 through December 1982) was \$3,145.2. It should be noted that the ADF&G June 1980 budget did not reflect Acres support services to ADF&G which were budgeted separately by Acres and not made available to us. To arrive at an original budget figure, which assumed no program redirection, we must add the Phase I FY 81 and FY 82 columns of the June 1980 budget summary. The figure of \$1,717.0 is the correct original budget figure for the July 1, 1980 to December 31, 1981, Phase I period which APA had us budget for in the June 1980 plan. A Phase I figure to coincide with a fiscal year to match APA's extra six months to June 30, 1982, would be \$2,431.1, an estimate derived by adding 50% of the Phase II FY 82-83 columns or \$714.1 to the \$1,717.0.

A review of enclosures A and B (enclosed) of our RSA amendment program/budget review sent to APA on April 3, 1981 gives a comparison with the "original" June 1980 figures for our RSAs based on program redirection to that point. For Phase I (July 1, 1980 to December 31, 1981) ADF&G, after program scoping changes, projected a revised budget of \$2,171.6. This change resulted because APA had funded certain program elements and tasks e.g., administration and support, and report preparation tasks after January 1, 1981. However, by adding \$536.7 from the Phase II column 4 of our April 3, 1981, budget summary to the \$2,171.6 we have the \$2,708.3 which was available to ADF&G for the period July 1, 1981 to June 30, 1982, which was the Phase I closeout for APA and included part of our Phase II field work. Remember our Phase I and Phase II work scheduled did not conform to the budget fiscal year on this project.

The increase of \$277.2 in budget from the original 1980 work plan (\$2,431.1 to \$2,708.3) includes some of the necessary field work funding for selected approved elements from the Phase II segment.

On November 9, 1981 we returned to APA with another budget review and the request for Phase II funding from January 1, 1982 to June 30, 1982. The budget summary from that transmittal

November 18, 1982

shows the program funded at \$2,597.1 which includes \$42.2 in state salary increases. An additional \$58.0 was added on February 16, 1982, which brought our RSA total for the Phase I period to June 30, 1982, to \$2,655.1.

Comparing that figure to our original June 1980 estimate of \$2,431.1 indicates that we had an increase of \$224.0 for the period July 1, 1980 to June 30, 1982, not \$900.0 as indicated in your letter.

Point 3 indicates equipment costs are \$300,000 over budget. Our records indicate that \$722.4 was available for equipment purchase through June 30, 1982. This increase of \$307.5 over our original \$414.9 estimate in the June 1980 budget is a result of purchase of some Phase II equipment for the FY 83 field season (see correspondence to APA of February 16, 1982 enclosed). Additional costs resulted from increases after loss of or renegotiated equipment contracts, purchase of equipment for replacement of items borrowed from other ADF&G programs to facilitate project startup, for equipment necessary to support scope changes including additional data processing capabilities for the accelerated programs and data analysis required by APA, or purchase of equipment necessary to replace worn and unsafe items. Good equipment is vital to insuring crew safety in remote and hazardous work areas. Such equipment also provides improved/adequate field camp facilities, which contributes to crew field effectiveness and improved collection of data with state-of-the-art techniques.

The text immediately following the third point in your letter merits some discussion as well. Although these statements do much to qualify the three points in your letter, it seems that it would be appropriate to include a discussion as to how APA and Acres arrived at the budget figures they advanced in the February 1980 Acres Plan of study. It is not clear to us whether their estimate of \$1,444.6 million budget for the aquatic studies in that document should have been for Phase I to June 30, 1982, as stated in the Acres 1980 plan. In 1980, the APA had the Department prepare budgets for Phase I based on the assumption that Phase I ended on December 30, 1981. This was with the exception of some program elements or tasks as previously mentioned. Perhaps their 1.4 million figure is due to a schedule oversight on their part.

The last sentence of the 4th paragraph of page 2 refers to the change in the FERC license application date states, "The change was due, in part, to the insufficient information which would have been provided by the Aquatic Studies for the July, 1982 deadline." The Department has stated before in correspondence made available to you during your audit in Anchorage, that a minimum five year time frame will be required to quantitatively

assess Su Hydro Project impacts and provide the basis for an adequate mitigation plan. This Department has not set FERC license application deadlines. The ADF&G has been charged with the responsibility of collecting field information on a biological resource which doesn't recognize these deadlines. We have collected a large quantity of good information but time and continued effort will be needed to quantifiably define important biological and physical relationships which may be impacted by the Su Hydro Project. Please note my enclosed letter of October 20, 1982, to Mr. Jeff Weltzen which touches on these subjects. We also strongly question whether the lack of fisheries information, as opposed to other study elements, was as much of a factor in the APA's decision for delaying the FERC license application date as suggested by APA.

You should also be aware that this year ADF&G has been given a role beyond our 1981-2 assignment of simply summarizing data from our field work. In FY 83 we will carry out an essential task of analysis and assessment of pre-project aquatic habitat and environmental conditions. The offer to assume this vital role is shown in my comments to the APA Board of Directors on April 16 of this year. You should also note my comments to the Board of Directors on the matter of coordination as it is relevant to your recommendation stated earlier.

Your last paragraph states, "APA and DFG have not had much experience with projects as large and complex as the Susitna Project and the Aquatic Studies." For the ADF&G, I can state this is a "yes and no" proposition. No, we have never brought together this many people into a singular field project of this scope or with a budget and biological resource needs identification controlled outside the Department by non-resource personnel for a project of this size and complexity. But, yes, we have an extensive historical background on the issues about Susitna, and other project developments and execution and how to translate these issue concerns into a field program. We have in the past conducted this type of program in the field with a high level of ability and expertise.

We agree detailed planning is necessary, but the constraints of time scheduling for license application and the failure of APA and Acres to recognize the timing of biological data collection and consequent professional reporting has been a problem. This year for FY 83, ADF&G had to wait until late May 1982 for a substantive reaction to our study proposals and budgets which were submitted to APA in early March 1982. The RSAs weren't signed until June, only a matter of two to three weeks before our FY 83 field program was due to start. How conducive to good planning has this process been? Poor at best, but then this agency was not included in the rule making process. I can state

Mr. Daniel A. Allen

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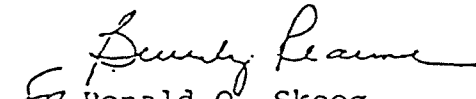
November 18, 1982

categorically that good planning has been infused throughout this project, as the documents available demonstrate.

In summary, we concur with your closing recommendation to meet with the APA. We hope the APA will make a strong effort to respond positively in this direction.

Thank you for the opportunity to comment.

Sincerely,


for Ronald O. Skoog
Commissioner

Enclosures (5)

cc: Richard Logan
Steve Pennoyer

ENCLOSURE B

Su Hydro Aquatic Studies
2207 Spenard Road

File # 02-82-7.10

October 19, 1982

Mr. Kenton D. Wohl
Acting Assistant Regional Director
U.S. Department of the Interior
Fish and Wildlife Service
1011 East Tudor Road
Anchorage, Alaska 99503

Dear Kent:

Thank you for your 5 October 1982 letter of inquiry pertaining to the 19 August 1982 correspondence from Robert A. Mohn, Alaska Power Authority (APA), to me. Mr. Mohn, as you know, stated that his letter was prompted by an inquiry from Mark Robinson, Federal Energy Regulatory Commission (FERC), to Mr. Mohn asking if fisheries information from 1982 would be included in the APA license application for Su Hydro which is scheduled for submittal to FERC in February 1983.

Your summarization of the 13 May 1982 and 2 June 1982 meetings on the topic of data presentation and analysis schedules is accurate. The attached report schedule from our Reimbursable Services Agreement (RSA) with the APA, indicates that our final reports for 1982 will follow the February 1983 preparation of the Exhibit E and the license application. As noted at the meetings referenced by you, this potential situation was recognized by study participants last spring. It was pointed out then, that the 1982 open water fisheries and habitat data collection season was projected to extend into October 1982. The time to reduce and analyze the large volume of complex data served as the basis for establishing this reporting schedule. Therefore, as you correctly noted in your letter, it was established by Acres American, Inc. (Acres) and the APA that "data gatherers" (ADF&G) and "impact assessors" (AEIDC) would be insulated from the FERC license application preparation schedule.

Accordingly, the ADF&G Su Hydro Aquatic Studies Team will provide the reports indicated in the attached RSA schedule. However, in an attempt to accomodate the APA and FERC, we have further communicated with Mr. Robinson and staff from the APA, Acres, and Woodward-Clyde to determine whether any of our ~~provisional 1982~~ open water data would be of value if included as part of the February 1982 Exhibit E document being prepared by Woodward-Clyde before its presentation by ADF&G in report form. Essentially, the major interest is for incorporation of 1982 escapement data from our Anadromous Adult project to

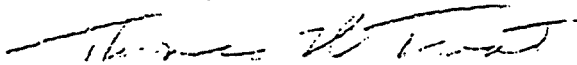
October 19, 1982

Anadromous Adult project to evaluate escapement trends. We, therefore, have agreed to submit this information in a "provisional" format with the understanding that it will be subject to correction when presented in our draft basic data reports. These provisional data will represent first stage reduction of field forms and will be presented in tabular and graphic format. Our intent, at present, is to transfer these provisional data to Woodward-Clyde in November when Woodward-Clyde will be in the process of re-editing their Exhibit E document.

This provisional data transmittal ties into the current scope of FY 1983 data reduction activities by the ADF&G and it does not effect a change in our previously agreed upon reporting schedule. A limitation of these data which will restrict their availability for transfer will be that each transfer must be comprised of a complete package of a specific data set (e.g., complete results of sonar escapement and indexing of adult salmon species through various reaches of the river). This is because partial transfer of data, in our view, could lead to erroneous conclusions by other reviewers and analysts. Therefore, because our open water field season for the Anadromous Adult Project continued into September, complete reduction of data sets will not be available until late October and on into November.

We appreciate the opportunity to clarify our situation on the topics you raised. If you have further questions, please do not hesitate to contact me again.

Sincerely,



Thomas W. Trent
Aquatic Studies Coordinator
Su Hydro Aquatic Studies
Telephone 274-7583

attachment

cc: Commissioner Skoog, ADF&G
Richard Logan, ADF&G
John Hayden, Acres
Richard Fleming, APA
Robert Mohn, APA
Mark Robinson, FERC
Larry Moulton, Woodward-Clyde
Bill Wilson, AEIDC
Al Carson, ADNRR

bcc: Project Leaders
L. Heckart
M. Mills
A. Kingsbury

TWT:kw

02-82-710

RECEIVED

1982

Alaska Dept. of Fish & G.
Sport Fish/Susitna Hydr

05 OCT 1982



IN REPLY REFER TO

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1011 E. TUDOR RD.
ANCHORAGE, ALASKA 99503
(907) 276-3800

Thomas Trent
Susitna Hydro Aquatic Studies Coordinator
Alaska Department of Fish and Game
2207 Spenard Road
Anchorage, Alaska 99503

Dear Tom:

Recently we received a copy of a letter dated 19 August 1982 from Robert A. Mohn, the Alaska Power Authority Director of Engineering, addressed to you. We are concerned by the gist of that letter that information transfer has not proceeded as rapidly as intended and that the Alaska Department of Fish and Game (ADF&G) Su Hydro Aquatic Studies Section bears responsibility.

On 13 May 1982 and 2 June 1982, Gary Stackhouse and Leonard Corin, representing the U.S. Fish and Wildlife Service, were in attendance at meetings during which tasks and scheduling of the three aquatic studies groups, ADF&G, the Alaska Environmental Information and Data Center (AEIDC), and Woodward-Clyde were discussed. It was expressed by Acres American, Inc. at the 13 May meeting that:

1. The "data gatherers" (ADF&G) and "impacts assessers" (AEIDC) would be insulated from the time constraints due to license application deadlines so as to allow the identification and quantification of project-related impacts to be completed in a timely fashion; and
2. The ADF&G data base draft reports would be due in January 1983; and then revised by 15 April 1983. A second draft report would be forthcoming in May 1983, and finalized in June 1983. This report would provide an initial biometric analysis and the first assessment of the fisheries-habitat relationship based upon the 1982 field data. This contractual scheduling is illustrated (pp. 157 and 160) in the ADF&G Draft Aquatic Studies Procedures Manual for Phase II of the Susitna Hydro Studies, dated July 1982.

We request that you clarify the present scheduling obligations of your office in regard to product reports. If you believe a meeting would be appropriate to discuss any new information transfer arrangement, please do not hesitate to contact me.

Sincerely,

Anthony J. Skoog
Anthony J. Skoog
Regional Director

cc: Commissioner Skoog, ADF&G, Juneau
John Hayden, Acres American, Anchorage
Richard Fleming, APA, Anchorage
Robert A. Mohn, APA, Anchorage
Mark Robinson, FERC, Washington, D.C.
Larry Moulton, Woodward-Clyde, Anchorage
Bill Wilson, AEIDC, Anchorage

March 1, 1983 ADF&G, FY 84 Draft Plan of Study (POS)

April 1, 1983 APA-ADF&G, FY 84 RSA and POS Agreement.
Contingent on approval of funding by the
Legislature.

April 15, 1983 ADF&G, Revised Draft Basic Data Report

May 1, 1983 ADF&G, Draft Fisheries and Habitat Relationships
Report. An internal working document which
functions as a data/information transmittal to
AEIDC and other study participants.

June 1, 1983 ADF&G, FY 84 Procedures Manual.

June 30, 1983 ADF&G, Final Draft Fisheries and Habitat
Relationship Report. This is a formal document
available for broad distribution by the APA to
study participants, agencies and the public.

June 30, 1983 ADF&G, Draft Basic Data Report. This would
cover winter 82/83 work and include incubation
study data. This is an internal working document
and data transmittal to study participants.

October 30, 1983 AEIDC Proposed, Draft Impact Assessment Report

F. Procedures Manual

(The Alaska Department of Fish and Game will provide an annual
update of the aquatic studies procedure manual by June 1 of each
project year.)

The following discussion outlines the reporting and planning reports and events the ADF&G intend to follow during FY83. Also included are reports based on the proposed reporting schedule of Woodward-Clyde and the Arctic Environmental Information and Data Center (AEIDC). The information presented is to give a perspective of planning and reporting events related to the ADF&G Su Hydro Aquatic Studies. Some preliminary conceptual detail of our reports is also presented based on preliminary discussions with AEIDC regarding our interfacing role in the analysis and interpretation of pre and post project conditions.

The schedule of planning and reporting events is as follows:

July 15, 1982	<u>ADF&G Draft Procedures Manual FY 83 Field Programs</u> . This is a basic internal ADF&G planning and field guidance document.
July 31, 1982	<u>Woodward-Clyde (Proposed) Draft Mitigation Outline</u>
November 30, 1982	<u>AEIDC (Proposed)</u> , Internal Working Document, conceptualizing and visualizing project impacts on a non-quantitative basis.
January 31, 1983	<u>ADF&G, Draft Basic Data Report</u> . This is an internal working document and also provides for data transmittal to AEIDC and Woodward-Clyde and others as appropriate. It basically presents what the data is, how and where it was collected. The report would include winter 81/82 data and data for the ice free season from May thru October 1983. This report does not include habitat versus fisheries relationship information for the winter of 82/83 data or incubation study data collected through the winter of 82/83.
January 31, 1983	<u>Woodward-Clyde (Proposed)</u> , Draft Exhibit E.

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

OFFICE OF THE COMMISSIONER

SUPPORT BUILDING
JUNEAU, ALASKA 99901

December 5, 1978

Eric P. Yould
Executive Director
Alaska Power Authority
313 West 4th Avenue, Suite 31
Anchorage, Alaska 99501

Dear Mr. Yould:

The Alaska Department of Fish and Game conducted a detailed review of the proposed biological studies in the Susitna Hydro Plan of Study (POS) during April of this year to assist the Corps of Engineers in POS revision. Subsequently, the results of this effort were printed in the June 1978 POS document.

In his June 28 letter transmitting the revised POS to the Alaska Power Authority, Colonel Robertson of the Corps stated, "the activities defined in this document have been developed to adequately address determination of project feasibility." This statement is only partially correct. Although the study objectives are adequate, the funding is totally inadequate to meet those objectives.

On page 40, paragraph 2 of the revised POS, it is stated that "The biological studies outlined in the Plan of Study are of sufficient depth to provide, at the end of Step 2, a strong indication of the probable magnitude of the impacts of the project and to evaluate project feasibility, but may be unable to define the magnitude of mitigation." We agree that the proposed range of the biological studies discussed in these narratives, if performed, should give a strong indication of the feasibility of the Susitna Hydro Project. The budget levels as presently apportioned by the Corps will, however, sorely impair the level of technical and professional sophistication needed to determine feasibility. On April 25, 1978, a letter (attached) by Tom Trent, the Susitna Hydro Studies Coordinator for the Department, forwarded to the Corps of Engineers this Department's basic agreement to the thrust of the biological studies and also included our recommended budget. The budgets proposed by the Department of Fish and

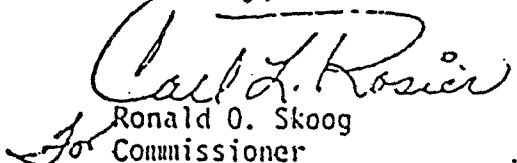
Game are those we believe necessary to provide the necessary information to provide project feasibility.

Although there is an aggressive effort to get the Phase I studies moving along the schedule proposed in the Susitna Hydro POS, both the private and governmental sectors must recognize that the Susitna Hydro Project will still be subject to the requirements of Federal environmental law, particularly the National Environmental Policy Act and the Fish and Wildlife Coordination Act. Inadequate Phase I studies and failure to meet the standards of these laws and regulations for project feasibility can, and probably will, result in delays from litigation by preservationist and anti-development interests.

The constraints placed on the Corps by the 25 million dollar figure in proposed Federal guarantee legislation for support of the Phase I investigations is unfortunate. It has resulted in reverse budgeting from the top down rather than from the bottom, and consequently, we believe a reduced concern for the adequacy of environmental study programs and their priorities. This Department believes the budgeting situation is poor at best, and every effort should be made by the State of Alaska and our congressional delegation to correct it by reviewing and revising the dollar figure for Federal guarantee legislation to reflect our Department's and other agencies' budget proposals.

Your support and leadership in addressing a solution to our concerns would be greatly appreciated.

Sincerely,


Ronald O. Skoog
Commissioner

Attachment

cc: R. Logan
T. Trent

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

ENCLOSURE E

JAY S. HAMMOND, GOVERNOR

111 RASPBERRY ROAD
ANCHORAGE 99507

October 31, 1979

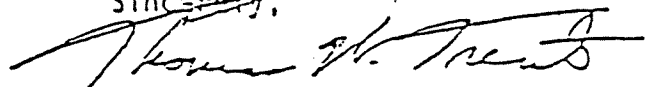
Mr. Eric Yould, Director
Alaska Power Authority
333 W. 4th Avenue
Anchorage, Alaska 99510

Dear Mr. Yould:

The Alaska Department of Fish and Game is providing the enclosed Phase I 25 month portion of the 5-year fisheries and wildlife study proposed to be conducted as part of the Susitna Hydroelectric feasibility investigations. The proposals were developed following discussions with Acres-American and their environmental studies subcontractor, Terrestrial Environmental Specialists. We have also met with representatives of the U.S. Fish and Wildlife Service and the Alaska Department of Natural Resources to obtain their suggestions and advice relative to portions of our proposals and the development of a final revised plan of study. I must indicate, however, that it should not be inferred that USFWS and ADNR have formally endorsed these proposals in their entirety. Their formal positions regarding the entire revised plan of study will undoubtedly come during the next agency and public review stage.

In his letter to me on October 4, Robert Mohn of your staff discussed a number of issues and subject areas which required our input on the development of the revised plan of study. The information provided herein should satisfy part of those requirements outlined by the APA, but specific refinements addressing our concerns outlined in our attached proposal and comments of other agencies will be needed during the period Acres or the Corps of Engineers is revising the POS next month.

Sincerely,



Thomas W. Trent
Regional Supervisor
Habitat Protection Section

cc: Representative R. Halford
Representative B. Rodgers
Commissioner R. O. Skoog - ADF&G
Commissioner E. W. Mueller - ADEC
Commissioner R. E. LaResche - ADNR
J. Lawrence - Acres
J. Barnes - TES
R. Bowker - USFWS

SUSITNA HYDROELECTRIC PROJECT

Preliminary Final Plan of Study

Fish and Wildlife Studies

proposed by the

Alaska Department of Fish and Game

November 1979

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APPENDIX

Attachment I, Letter to Eric Yould, APA, from Theodore Smith,
ADNR, October 26, 1979.

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PROGRAM JUSTIFICATION

The programs proposed by the Alaska Department of Fish and Game (ADF&G) are the first phase of a five year study program, necessary in the opinion of this Department, to meet the provisions of numerous federal and state laws and regulations providing for the consideration of fish and wildlife values in pre-project planning and evaluation of impact assessment, project possibility determination, mitigation of probable impacts should the project be constructed, and surveillance and monitoring during and after project construction. The biological objectives and justification are explained in the task work plans; the statutory and regulatory mandates for conducting these proposed work plans are outlined hereafter:

Federal/State Laws

Fish and Wildlife Coordination Act (FWCA)

The Fish and Wildlife Coordination Act, draft uniform procedures for compliance; May 1979 further standardizes procedures and interagency relationships to insure, "that wildlife conservation is fully considered and weighed equally with other project features in agency decision making processes by integrating such considerations into project planning, National Environmental Policy Act (NEPA) compliance procedures, financial and economic analyses, authorization documents, and project implementation."

As stated in the Federal Register (Vol 44, No. 98) this Act applies not only in the project area, but wherever project impacts may occur.

Subpart B FWCA Compliance Procedures

Sec. 410.21 Equal consideration

Equal consideration of wildlife resource values in project planning and approval is the essence of the FWCA compliance process. It requires action agencies (the Alaska Power Authority, APA) to involve wildlife agencies (the Alaska Department of Fish and Game and U.S. Fish and Wildlife Service, USFWS) throughout their planning, approval, and implementation process for a project and highlights the need to utilize a systematic approach to analyzing and establishing planning objectives for wildlife-resource-needs and problems and developing and evaluating alternative plans.

Sec. 410.22 Consultation

(a) Initiation. The FWCA compliance process may be initiated by a potential applicant, an action agency, or a wildlife agency.

(b) Potential Applicants. Implementing procedures of action agencies shall provide that applicants for those non-federal project approvals which require a water-dependent power project approval from the Federal Energy Regulatory Commission (FERC) (also applies to preliminary FERC permit) contain written evidence that they initiated the FWCA compliance process with both Regional Directors and the head of the State wildlife agency exercising administration over the fish and wildlife resources of the state(s) wherein the project is to be constructed and early site review (NRC) applicants.

The intent of this paragraph (a)(1) of this section is to assist applicants in designing environmentally sound projects without waste of their planning resources and to minimize the potential for delay in the processing of applications. Action agency implementing procedures shall advise that consultation should be initiated by the applicant at the earliest stages of its project planning, and that its submissions to wildlife agencies shall indicate the general work or activity being considered, its purpose(s), and the general area in which it is contemplated.

National Environmental Policy Act (NEPA)

The Council on Environmental Quality (CEQ), Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR, Parts 1500-1508, July 30, 1979) specifies provisions requiring the integration of the NEPA process into early planning, the integration of NEPA requirements with other environmental review and consultation requirements, and the use of the scoping process.

Clean Water Act

Section 404 of the Clean Water Act of 1977 and regulations for implementation of the permit program of the Corps of Engineers (33 CFR, Parts 320-329, July 19, 1977) requires that a Department of the Army permit(s) be obtained for certain structures or work in or affecting waters of the United States. The application(s) for such a permit(s) will be subject to review by wildlife agencies.

Executive Order 11990 (Wetlands)

This order was issued "in order to avoid to the extent possible the long-term and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative," and Executive Order 11988 (Floodplains) was issued "to avoid to the extent possible the long-term and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative." All federal agencies are responsible to comply with these EO's in the planning and decision-making process.

Endangered Species Act

Section 7(c) of the Endangered Species Act, 87 Stat. 884, as amended, requires the APA to ask the Secretary of the Interior, acting through the U.S. Fish and Wildlife Service, whether any listed or proposed endangered or threatened species may be present in the area of the Susitna Hydroelectric Power Project. If the Fish and Wildlife Service advises that such species may be present in the area of the project, the APA is required by Section 7(c) to conduct a Biological Assessment

to identify any listed or proposed endangered or threatened species which are likely to be affected by the construction project. The assessment is to be completed within 180 days, unless a time extension is mutually agreed upon. No contract for physical construction may be entered into and no physical construction may begin until the Biological Assessment is completed. In the event the conclusions drawn from the Biological Assessment are that listed endangered or threatened species are likely to be affected by the construction project, the APA is required by Section 7(a) to initiate the consultation process.

Water Resources Council, Principles and Standards

The principles and standards for Planning Water and Related Land Resources (18 CFR, Part 704, April 1, 1978) were established for planning the use of the water and related land resources of the United States to achieve objectives, determined cooperatively, through the coordinated actions of the Federal, State, and local governments; private enterprise and organizations; and individuals. These principles include providing the basis for planning of federal and federally assisted water and land resources programs and projects and federal licensing activities as listed in the Standards. The President in his June 6, 1978 statement further defined federal water policies.

State Laws

Title 16

Title 16, independently of Federal laws, mandates the Alaska Department of Fish and Game to manage, protect, maintain, enhance, and extend the fish and game, and aquatic plant resources and the habitat that sustains them including assisting the U.S. Fish and Wildlife Service in the enforcement of federal laws and regulations pertaining to fish and wildlife.

Sec. 16.05.870 also states that:

(b) If a person or governmental agency desires to construct a hydraulic project, or use, divert, obstruct, pollute, or change the natural flow or bed of a specified river, lake or stream, or to use wheeled, tracked, or excavating equipment or log-dragging equipment in the bed of a specified river, lake, or stream, the person or governmental agency shall notify the commissioner of this intention before the beginning of the construction or use.

(c) If the commissioner determines to do so, he shall, in the letter of acknowledgement, require the person or governmental agency to submit to him full plans and specifications of the proposed construction or work, complete plans and specifications for the proper protection of fish and game in connection with the construction or work, or in connection with the use, and the approximate date the construction, work, or use will begin, and shall require the person or governmental agency to obtain written approval from him as to the sufficiency of the plans or specifications before the proposed construction or use is begun.

Purpose. The purpose of this section is to protect and conserve fish and game and other natural resources. 1964.
Att'y Gen., No. 10

Alaska Coastal Management Program

The recently approved Alaska Coastal Management Program (ACMP) mandates that all State, Federal and Local government agencies must coordinate all planning and development activities in the State's coastal zone to ensure adequate consideration and protection of Alaska's coastal waters and resources. As the proposed Susitna Hydropower project will occur within Alaska's coastal zone and certainly will directly influence coastal waters all planning and development plans must be consistent with the Coastal Standards and the Mat-Su Borough's District Coastal Plan once it is completed and approved. The Coastal Standards are presently in effect and all State and Federal actions must be consistent with them. Section 6AA C 80.130 states that:

(a) habitats in the coastal area which are subject to the Alaska Coastal Management Program include:

- (1) offshore
- (2) estuaries
- (3) wetlands and tidal flats
- (4) rocky islands and sea cliffs
- (5) barrier islands and lagoons
- (6) exposed high energy coasts
- (7) rivers, streams and lakes
- (8) important upland habitat

These habitats which are specifically defined in the Standards must be identified within the Susitna Hydro Study area during the feasibility studies. In addition, Section (b) states that habitats contained in (a) of this section shall be managed so as to maintain or enhance the biological, physical and chemical characteristics of the habitat which contributes to their capacity to support living resources. Specific guidelines are also provided for each coastal habitat. The Coastal Zone Management consistency requirements are mandated in both the Alaskan and Federal CZM Acts and the Fish and Wildlife Coordination Act. The Question of consistency with CZM standards goes well beyond the FERC licensing requirements and should be treated as a separate step in determining the feasibility of Hydro Power alternatives.

The Alaska Department of Fish and Game has a strong mandate under these laws to insure that adequate planning study and evaluation of the fish and wildlife resources in the Susitna Hydro Project area are completed and become a part of the decision making information used to determine project feasibility. If the project is constructed these studies will be the basis for mitigation plans or the formulation of mitigation studies to offset project impacts. Mitigation as defined in Section 1508.20 of the National Environmental Policy Act Implementation Regulations includes:

- (a) Avoiding the impact altogether by not taking a certain action or parts of an action.
- (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- (e) Compensating for the impact by replacing or providing substitute resources or environments.

ISSUES, PROBLEMS, CONCERNS AND RECOMMENDATIONS
REGARDING THE SUSITNA HYDRO PLAN OF STUDY

Project Review and Interagency Coordination

Because of the magnitude of the Susitna Hydroelectric Feasibility Study, continuous coordination in accord with the Uniform Procedures for compliance with the Fish and Wildlife Coordination Act will be best accomplished through formation of a Susitna Hydroelectric Steering Committee. The function of this committee would be to provide coordinated exchanges of information between the Alaska Power Authority and interested resource management agencies. Through this exchange, the concerns of all agencies involved would be identified early and hopefully prevent unnecessary delays in the progress of the feasibility study.

We propose that the Steering Committee be composed of representatives of resource agencies with responsibilities pertaining to the Susitna Hydroelectric Feasibility Studies (ADF&G, ADEC, ADNR, USFWS, USGS, and NMFS). This committee would provide for interagency coordination through joint review of project related materials and for development, through convening the committee, of more informed and uniform positions representing all resource interests to be transmitted to the applicant. This we believe provides that applicant with a more efficient process for information exchange.

The objectives of this committee are to:

1. develop plans of study which are based upon full agency participation throughout each phase of the planning process;
2. select the resource specialists who will undertake the required studies and investigations;
3. insure that the biological and related environmental studies, their timing, and technical adequacy are planned, implemented, and conducted to provide the quantitative and qualitative data necessary to: a) assess the potential impacts to fish and wildlife resources; b) provide the basis for mitigation and compensation of resource losses which will result from the project at the time of submission of a FERC license application; and c) select the favored mitigation and/or compensation alternative from the product generated by "b";
4. provide the forum for continued project review to jointly develop all aspects of the studies and to provide for a timely exchange of information and for redirection of studies should the accomplishment of specific objectives be in jeopardy;

5. assure that the studies are conducted in compliance with all state and federal laws, regulations, Executives Orders, and mandates as they apply to fish and wildlife resources; and
6. provide unified agency comments from the committee to the applicant.

The Susitna Hydroelectric Steering Committee should convene on a regular basis as dictated by planning and review requirements. However, it seems appropriate to meet at a minimum on a monthly basis to exchange reports and to be advised of progress toward objectives by the Alaska Power Authority and principle investigators. A record of agreements reached, recommendations and comments provided, and responsibilities assigned in meetings should be distributed to all parties involved.

Progress reports should be submitted to members of the committee quarterly. Comments from the committee to APA would then be submitted at a pre-established time thereafter. Comments provided to the Alaska Power Authority should be appropriately addressed and incorporated into project documents.

The participating members of the committee must have free access to all data collected during the study. In addition, principal project personnel should be accessible to members of the committee in case clarification of any aspect of the field studies is required.

Phase I Studies Initiation

The programs outlined in the work plans are scoped into a 24 month time frame for Phase I field work and one additional month covering Phase I annual report development during January 1982. The completion of several of these studies between January 1980 and January 1982 is not considered feasible.

A large amount of materials, equipment and scientific gear will be required for these studies. Many of these items will require ordering well in advance of the date on which they would be employed in the field. For example, major sonar and radio-telemetry development is anticipated for anadromous adult stock assessment and migrational work. The Bendix Corporation, the supplier of the sonar equipment the Department uses, has indicated a minimum of 18 months from order to delivery of sonar equipment. Also, members of the USFWS who have utilized radio-telemetry in the State have indicated an up to one year delay in the fielding of that equipment until radio frequencies are approved by the FCC.

New State personnel regulations may also affect this Department's timely implementation of studies unless an expedited procedure for employing staff dedicated to these studies is developed. If funds are released on January 1, 1980, several months will be required to obtain the staff needed to begin field work in 1980. These staff are crucial to the continued progress of specific planning and organizational work which

must necessarily begin as close to January as possible or further study delay will be encountered.

Allowance must be made for the impacts of equipment and personnel constraints on the ability of this Department to conduct the proposed fish and wildlife studies. These are realities which must be dealt with and are fundamental determinants of the adequacy of the work we have proposed to do.

Phase II Studies

A major position of the Department for the past several years is that many of the biological studies must be conducted through a five year period to provide the basic cyclical, environmental information needed to evaluate project impacts and the mitigation requirements or alternatives that are available. In the time availed us, we have not been able to provide a specific budget or work plan proposal for the studies that may be required in the years succeeding Phase I into Phase II, and it may not be reasonable to do so at this stage.

An acceptable Plan of Study must insure that studies are continued into Phase II. It is the position of this Department that study continuation and redirection should be based on the outcome of Phase I information. The proposed Susitna Hydroelectric Steering Committee, which has been proposed herein, is an important group, in our opinion, to insure scoping and budgeting of Phase II studies are executed in a consistent and systematic fashion.

Socioeconomic Considerations

Of primary importance to this Department is Objective 4: to determine the economic, recreational, social, and aesthetic values of the existing resident and anadromous fish stocks and habitat.

This objective will enable the Susitna Hydro environmental studies to assess the socioeconomic impacts on commercial, recreational, and subsistence users and industries supporting them. Over half of Alaska's growing population resides in the proximity of the impact area. Not only this population, but commercial fishermen, recreationists, and businesses from throughout the nation and other countries may be affected by the hydroelectric project. The popularity of Denali State Park and nearby Mt. McKinley National Park further attests to the high social, recreational, and aesthetic qualities of the area.

The basic problem in regard to the Susitna Hydro POS is to define and conduct the studies which will adequately evaluate the socioeconomic (monetary and nonmonetary) and cultural values of fish and wildlife and

the habitat that supports them when comparing them with other (more tangible) monetary resource values and uses associated with hydropower development.

It must be emphasized that to ultimately select the best uses of the natural resources of the Susitna Basin from which society will receive the most long term benefit, the net benefits (total benefit minus total costs) must be adequately evaluated. Consequently, values must be assigned to each potential resource use. When monetary terms are inappropriate, agencies will need to devise nonmonetary means of evaluating impacts to fish and wildlife resources. Existing regulations require agencies such as the Corps of Engineers (COE) or the Alaska Power Authority (APA) to search out, develop and follow procedures reasonably calculated to bring environmental factors to peer status with dollars and technology in their decision-making. NEPA directs action agencies to "the fullest extent possible":

identify and develop methods and procedures which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations (42 U.S.C. S4332 (a) (B)).

These methods should quantify habitat values which are equivalent to the extent and type of habitat affected by the planned project and estimate the quantity and quality of habitat needed to be acquired and/or improved to mitigate loss. It can then be determined if the socio-economic impacts of the project can be mitigated and at what cost. Furthermore, the Water Resources Council directs action agencies to devise nonmonetary means of evaluating fish and wildlife impacts:

When effects cannot or should not be expressed in monetary terms, they will be set forth, insofar as is reasonably possible, in appropriate quantitative and qualitative physical, biological or other measures reflecting the enhancement or improvement of the characteristics relevant to the type of effect under consideration (38 F.R. 24797).

As a result, the often-cited excuse that the evaluation of supposedly "intangible" habitat values is difficult or impossible is no longer valid (Horvath 1978; Dwyer 1977; Copeland 1976; Morrow 1979).

Specific data to analyze both the nonmonetary and monetary socioeconomic recreational, social, and cultural values of the Susitna River Basin are lacking. It should also be stressed that an adequate assessment of monetary values by traditional methods must be based on commercial,

recreational, and subsistence use data which are not currently available and not being collected. Designs for this data collection and the data collection itself would best be done by the Department of Fish and Game, the traditional collector of data on these users. Therefore, this Department would like to actively participate in planning those portions pertaining to socioeconomics, recreational, cultural and aesthetic values of the Susitna River Basin.

Administrative Overhead and Time Delays

Overhead costs have not been included in the attached budget. The Alaska Department of Fish and Game (ADF&G) normally charges overhead to cover costs incurred by its Division of Administration. On most outside contracts, this amounts to approximately 10 percent of all costs except equipment. However, overhead is usually not charged on reimbursable service agreements (RSA) between State agencies. Susitna Hydroelectric Project studies will place an additional burden on the Division of Administration particularly during the first year when major equipment purchases and personnel hiring will occur. However, this additional work load is not likely to cost 10 percent of the proposed budget (approximately \$600,000 during 1980 and 1981). Surplus money would presumably revert to the General Fund without accomplishing any purpose.

A more reasonable approach would be for the Division of Administration of the ADF&G, the Alaska Department of Administration, and the Alaska Power Authority to design a realistic program for administering the funds and to have APA reimburse the appropriate agencies for actual costs. These costs should be added to the overall budget.

The time normally required to process purchase requisitions and contracts is likely to create problems with APA's time table. A similar problem developed when the Legislature appropriated Bristol Bay disaster relief funds during 1974 after a failure in the salmon run. The problem was solved by funding a position in the Anchorage office of the Department of Administration to expedite purchasing. This allowed the rapid purchase of items without violating purchasing procedures and without excessively burdening the State's regular administrative staff. A similar approach would be beneficial to the Susitna Program. It is recommended that APA and Administration consider it as an option.

Monitoring & Surveillance

Monitoring and surveillance of Phase I and II project activities to minimize the impact of these activities on fish and wildlife and their habitats will be necessary.

The Susitna Hydro Coordinator will be responsible for assuring that the Department reviews and comments upon the host of State and Federal permit actions which may be required each year for land and water use.

He will be specifically responsible for ADF&G Title 16 permit applications review and development stipulations to protect fish and game.

Estuarine Studies

The Department of Fish and Game has not attempted to detail possible estuarine studies for the preliminary final POS. These studies can be delayed pending the outcome of Phase I studies.

If demonstrable hydrologic and water quality changes near the mouth of the Susitna River are shown or projected (based on the analysis of 1980 or 1981 data), estuarine studies should be initiated to identify the potential for project impacts on that environment.

AQUATIC STUDIES

Introduction

The Susitna River drainage, located north of Cook Inlet, encompasses an area of 19,400 square miles. The free-flowing Susitna River is approximately 275 miles long from its source in the Alaska Mountain Range to its point of discharge into Cook Inlet. The mainstem river and its major tributaries originate in glaciers and carry a heavy silt load during the ice-free months, but there are also many smaller tributaries which are perennially silt-free.

The construction of power dams on the Susitna River will adversely affect portions of the fish and wildlife resources of the Susitna River Basin. The two dam system proposed by the Corps of Engineers (COE) would inundate in excess of 50,500 acres of the Susitna River Basin aquatic and terrestrial habitat upstream of Devil Canyon. Regulation of the mainstem river will substantially alter the natural flow regime downstream. The transmission line corridor, substations, road corridor, and construction pad sites may also impact aquatic and terrestrial communities and their habitat. Historically, the long-and-short-term environmental impacts of hydroelectric dams have adversely altered the extremely delicate balance of ecosystems (Keller 1976; Hagan et al 1973).

Background knowledge of the Susitna River Basin is limited. The proposed hydroelectric development necessitates gaining a thorough knowledge of its natural characteristics and populations prior to final dam design approval and construction authorization in order to protect the aquatic and terrestrial populations from unnecessary losses. All engineering, hydrological, biological, and other project feasibility study activities conducted by the various governmental and private agencies will also have to be monitored and regulated to prevent ecological disturbances.

A survey of the fishery resources should cover complete life history cycles. A 30 month program prior to license application (Phase I), although supplying essential information about the fishery, is inadequate and should be continued through supplemental studies in Phase II. The proposed studies should be conducted for a minimum period of 5 years.

Five species of Pacific salmon (chinook, coho, chum, pink, and sockeye) inhabit the Susitna River drainage during their freshwater life history stages. The majority of chinook, coho, chum, and pink salmon production in Cook Inlet occurs within this drainage. An anadromous smelt, the eulachon, also utilizes the lower reaches of the river.

Cook Inlet is one of the major anadromous fish producing areas in the State of Alaska. The commercial catch of salmon reported for Cook Inlet during the five year period from 1971 to 1975 averaged over a million fish per year, and represented an average of 7.4 percent of the total catch for the State of Alaska. In addition to the commercial catch of

salmon, the recreational fisherery took about 90,000 salmon a year and the personal-use fishery, an additional 10,000 salmon per year. Sockeye, pink, and chum salmon are by far the most important commercial species in the area, making up over 90 per cent of the total catch from Cook Inlet; coho and chinook salmon make up the remainder. Chinook and coho salmon also are the species most favored by the recreational fishermen.

Grayling, rainbow trout, Dolly Varden, burbot, lake trout, and whitefish are some of the important resident fish species common to this system. Approximately 50 percent of the statewide sport fishing effort occurs within the Cook Inlet area. The recreational marine fishery is, however, very limited with the exception of a popular fishery at the vicinity of Deep Creek on Cook Inlet. The majority of the anadromous sport fish harvest occurs as the fish approach their spawning areas. Most, anglers within the Cook Inlet area show a preference for salmon rather than resident game fish when both types of fisheries are available. Resident populations are fished more heavily during fall and spring months during the absence of salmon runs.

Therefore, the proposed Susitna River hydroelectric project will have various impacts on both the indigenous organisms and the natural conditions within the aquatic environment.. Potential impacts to fish populations are the most obvious source of concern due to their socioeconomic and recreational importance to the people of Alaska and the Nation.

STUDY PROPOSALS

Individual study proposals are designed to provide the necessary background information to enable proper evaluation of impacts. Six general objectives have been outlined:

1. Determine the relative abundance and distribution of adult anadromous fish populations within the drainage.
2. Determine the distribution and abundance of selected resident and juvenile anadromous fish populations.
3. Determine the spatial and seasonal habitat requirements of anadromous and resident fish species during each stage of their life histories.
4. Determine the economic, recreational, social, and aesthetic values of the existing resident and anadromous fish stocks and habitat.

The Department has not developed a specific work plan for this objective but strongly believes the Acres-American POS must be strengthened to cover fish and wildlife concerns during Phase I.

5. Determine the impact the Devil Canyon project will have on the aquatic ecosystems and any required mitigation prior to construction approval decision. This is the primary objective of both Phase I and II studies. This will be discussed in detail in the Phase II work when it is written.
6. Determine a long-term plan of study, if the project is authorized, to monitor the impacts during and after project completion. This is also an objective of Phase II.

The study areas are generally categorized within the following locations:

- A. Cook Inlet area
- B. Cook Inlet to the Yentna River confluence
- C. Yentna River to the Talkeetna River confluence
- D. Talkeetna River confluence to the Devils Canyon dam site
- E. Devil Canyon dam site to the Tyone River confluence
- F. Proposed transmission line corridor(s), access roads, and construction pad sites

Scaling of the proposed studies with respect to timing, geographic locations, and intensity has been done with consideration of the resource knowledge available for each of the geographic locations identified above.

ENCLOSURE f

ALASKA POWER AUTHORITY

334 WEST 5th AVENUE - ANCHORAGE, ALASKA 99501

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

02-82-13.06

August 19, 1982

Tom Trent
Su Hydro Aquatic Studies
Coordinator
Alaska Dept. of Fish & Game
2207 Spenard Road
Anchorage, AK 99503

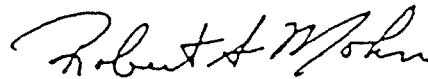
Dear Tom:

Mark Robinson, FERC's environmental manager for Susitna, called this week to express his surprise that little 1982 field season data would be incorporated in the February, 1983 license application. Mark's reaction is identical to what ours has been: frustration with the slow transfer of data from the field to the impact analysts and the mitigation planning team. Mark indicated that FERC's acceptance of the license application for processing is very much contingent upon 1982 data being included.

We want to work with you to find means to achieve more rapid transfer of results, at least for some key indicators. I have directed Richard Fleming to spearhead this effort; he will be contacting you shortly, along with John Hayden and Larry Moulton.

Your dedication to this goal is essential if the license application is to be accepted by FERC. Thank you for your help.

Sincerely,



Robert A. Mohn
Director of Engineering

cc: Commissioner Skoog
John Hayden, Acres
Richard Fleming
Mark Robinson, FERC
Keith Bayha, USFWS

RECEIVED

AUG 23 1982

Alaska Dept. of Fish & Game
Sport Fish/Susitna Hydro

Su Hydro Aquatic Studies
2207 Spenard Road
Anchorage, Alaska 99503
File: 02-82-13.06

ENCLOSURE

September 13, 1982

Mr. Robert Mohn
Director of Engineering
Alaska Power Authority
334 West 5th Avenue
Anchorage, Alaska 99501

Dear Bob:

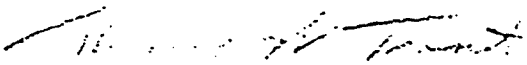
Thank you for your letter of August 19, 1982 regarding Mark Robinson's concerns about inclusion of 1982 field season data in the February 1983 license application.

In previous discussions this spring with APA, Acres, AEIDC and Woodward-Clyde staff, it has been recognized that complete reporting of 1982 data would generally be accomplishable within the time lines established in our current RSA. It was indicated to us by Acres on several occasions that the new reporting structure of AEIDC and ADF&G in post-project and preproject analysis of data, respectively, would not be driven by the FERC license application deadline.

We will, however, do our utmost to develop a list of "key indicators" as you have suggested for early transmittal in draft form. I hope we can avoid partial data transmittals, however, as these can create confusion for data analysts.

Currently, our staff is working on the basic data and habitat/fisheries relationship report outlines. Once we have these in hand we will evaluate what is going to be presented in our reports and prepare a "key indicator" list with APA, AEIDC, Acres and Woodward-Clyde staff that we can use to direct early data reduction and reporting efforts.

Sincerely,


Thomas W. Trent
Su Hydro Aquatic Studies Coordinator
Sports Fish Division

cc: Commissioner Skoog
K. Bayha
M. Robinson
R. Fleming
L. Moulton
G. Wilson
J. Hayden
R. Logan

bcc: L. Corin
A. Carson
L. Heckart
A. Kingsbury
M. Mills
Project Leaders

ALASKA POWER AUTHORITY

334 WEST 5th AVENUE - ANCHORAGE, ALASKA 99501

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

March 18, 1983

RECEIVED
MAR 21 1983
LEGISLATIVE
AUDIT

Mr. Gerald Wilkerson
The Legislature Budget and Audit Committee
Division of Legislative Audit
Audit Division
Pouch W
Juneau, Alaska 99811

Dear Mr. Wilkerson:

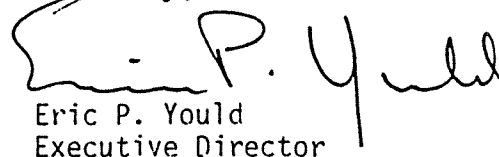
The Alaska Power Authority acknowledges receipt of your audit entitled "A Special Report on the Department of Fish and Game, Susitna River Hydroelectric Project for the Fiscal Years Ended June 30, 1982, 1981, and 1980".

Please note that events occurring since the investigation have overtaken the third recommendation. As a result of extensive coordination and intensive effort, biological data collected by the Aquatic Research Team during the summer of 1982 was incorporated in the February 1983 Federal Energy Regulatory Commission (FERC) license application to a substantial degree. Complete ADF&G data reports are being transmitted to FERC during March 1983 as companion documents to the license application. FERC is expected to determine, during the next month, that the environmental portions of the license application are acceptable for processing.

With respect to your first recommendation, work is presently underway to identify the objective and scope for next summer's field season.

Thank you for the opportunity to comment on this report, as well as on the earlier draft.

Sincerely,


Eric P. Yould
Executive Director

AB

May 12, 1983

The SuHydro study team has not conducted comprehensive fishery studies of the Susitna River below Talkeetna. Therefore, the level of understanding of that reach of the Susitna is relatively low. The ADF&G is on record as recommending sufficient study of the Susitna River downstream from Talkeetna to assess potential impacts from changes in water quality and quantity.

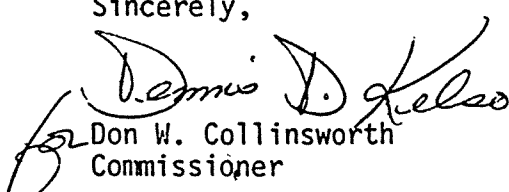
5. "Does the Department feel that changes in water quality parameters (as distinguished from physical impacts associated with changes in flow regimes) can be discounted as a possible source of significant impacts?"

Changes in water quality during project operation may adversely affect fishery resources of the Susitna River system. To date the affects of changes in temperature and turbidity have not been fully assessed. We understand that the APA is planning to conduct a temperature monitoring study that will help in the assessment of potential impacts of the operational temperature regime on fisheries.

6. "With the APA undertaking active reconsideration of the scope and scale of the project (e.g. lowering the Watana Dam height, building Devil Canyon first, only building one dam, etc.) can the Department adequately evaluate the fishery impacts to be expected from the project?"

The ADF&G has not been provided plans and specifications for alternatives to the Susitna Hydroelectric Project other than those contained in the Draft Exhibit E. Therefore we are unable to assess the related impacts to fisheries ~~attributable to those alternatives.~~

Sincerely,



for Don W. Collinsworth
Commissioner

cc: R. Logan
C. Yanagawa
R. Redick
D. Daisy
A. Kingsbury

AC

ALASKA POWER AUTHORITY

334 WEST 5th AVENUE - ANCHORAGE, ALASKA 99501

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

October 7, 1983

The Honorable Don Collinsworth
Commissioner
Department of Fish & Game
Subport Building
Juneau, Alaska 99811

Re: Susitna Hydroelectric Project Settlement Process

Dear Commissioner Collinsworth:

On July 29, 1983, the Federal Energy Regulatory Commission (FERC) accepted the Application for License for the Susitna Hydroelectric Project. With acceptance of the License Application, FERC has begun its licensing process which, among other things, requires agency and public consultation and review of the application, preparation and review of a draft and final environmental impact statement, need for power hearings, and environmental hearings, if ordered.

This project, because of its magnitude and complexity, has raised many concerns related to fish, wildlife and socioeconomic impacts. Your agency has been in the forefront with respect to identification of issues and concerns and has provided the Alaska Power Authority with recommendations related to study plans, impact assessment and regulatory matters for the past several years. The ultimate goal of our interaction has been to identify both the beneficial and undesirable potentials of the project, and through appropriate design and operation bring them to acceptable balance. This balancing act is no simple task considering the diverse, and sometimes conflicting interests represented by the various resource agencies. We hope, however, that with diligent effort we should be able to resolve outstanding issues. We hope you will join with us in setting as a goal for this and next year, achieving equitable settlement of remaining issues.

The FERC licensing process incorporates a prehearing "settlement process" during which the applicant and other participants settle their differences, and hopefully, eliminate the necessity for administrative hearings. If major matters remain unsettled, FERC holds administrative hearings in which the participants present their cases to an administrative law judge who renders a decision. Based upon these hearings which will include consideration of the final EIS, the FERC Commissioners make their decision on project licensing.

AC
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ALASKA POWER AUTHORITY

334 WEST 5th AVENUE - ANCHORAGE, ALASKA 99501

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

October 7, 1983

ALASKA DEPT. OF
FISH & GAME

OCT 10 1983

HABITAT
REGIONAL OFFICE

The Honorable Don Collinsworth
Commissioner
Department of Fish & Game
Support Building
Juneau, Alaska 99811

Re: Susitna Hydroelectric Project Settlement Process

Dear Commissioner Collinsworth:

On July 29, 1983, the Federal Energy Regulatory Commission (FERC) accepted the Application for License for the Susitna Hydroelectric Project. With acceptance of the License Application, FERC has begun its licensing process which, among other things, requires agency and public consultation and review of the application, preparation and review of a draft and final environmental impact statement, need for power hearings, and environmental hearings, if ordered.

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FERC may condition a license as it deems appropriate. Consequently, a license may carry stipulations or conditions which are not fully satisfactory to either the applicant resource agencies or intervenor. Prehearing settlement allows for developing an "Alaskan solution" rather than one emanating from Washington, D.C. Hearings can also be an expensive and time consuming process. The current FERC schedule allows approximately 20 months for the environmental hearing process.

We hope that your agency agrees that it is necessary to devote considerable energy toward reaching an equitable settlement and avoid hearings. Our first step in this effort has been to research all correspondence from your agency to the Power Authority regarding the Susitna project as well as your testimony to our Board of Directors, to identify issues your agency has raised related to the project. A listing of these issues appears as Appendix A to this letter. We would appreciate your review of this listing. It is our perception that as studies have continued and more data become available, some of your agency's issues have been dealt with adequately while others have gained greater prominence. We see this trend continuing during the future, but hope that it is now possible for your agency to determine which issues remain outstanding.

The second item we wish to discuss with you is your statutory responsibility with respect to the Susitna licensing and project review process.

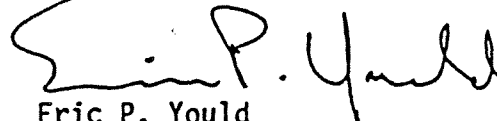
We have reviewed the Alaska Statutes Title 16, although not exhaustively, and understand your mandate is to manage, protect, maintain, improve and extend the fish, game and aquatic plant resources of the state in the interest of the economy and general well-being of the state (Sec. 16.05.020. Functions of the commissioner,). Further review of A.S. Title 16 and Title 5, Alaska Administrative Code leads us to believe, more specifically, your mandate relates to management and allocation (recognizing the roles of the Boards of Fish & Game) of fish and game resources and with respect to anadromous fisheries, protection of habitat and the management of state game refuges, sanctuaries and critical habitat areas.

We also recognize your role in the National Environmental Protection Act (NEPA) (42 USC 4332(c), 40 CFR 1500-1508) process The Fish & Wildlife Coordination Act (16 USC 662) (Reorganization Plan 4-1970), and the Federal Power Act (16 USC 797(c) 799-803, 18 CFR 4-40(d) and 4.31(f).

We would appreciate meeting with you and/or your staff to discuss Appendix A to add or delete issues as is appropriate and to discuss your role in the settlement process. We propose that we

meet sometime during the period October 24 - November 4, 1983. It might be helpful to have your assistant attorney general in attendance when discussing mandates and responsibilities related to the FERC process. Our contact person in this effort will be Mr. Thomas J. Arminski, and he will contact you to arrange a specific meeting time and place. Please do not hesitate to contact him if you have any questions.

Sincerely,



Eric P. Yould
Executive Director

Attachment as stated.

cc; Carl Yanagawa, Alaska Dept. Fish & Game, Anchorage
Jeff Lowenfels, Birch, Bittner, Horton et al
Jack Robinson, Harza-Ebasco

APPENDIX A

Contents

Introduction

List of Issues Raised by Your Agency

Master Bibliography of Sources

Introduction

Each issue on the attached list bears an alphanumeric designation for ease of identification. The system used for the alpha part of the designation is as follows:

<u>Subtask</u>	<u>Alpha Designation</u>
Aquatic Resources	A
Terrestrial Resources	T
Social Sciences	
Cultural	SC
Socioeconomics	SS
Recreation	SR
Aesthetics	SA
Land Use	SL

Within each subtask (Aquatic Resources, Terrestrial Resources, Social Sciences) each issue bears a different number. The resulting alphanumeric designation is unique for each issue and at the same time indicates the general topic with which each issue deals.

As issues are resolved during the settlement process, the alphanumeric designations for those issues will be retired, and will not be used for any new issues which may later be added to the list. Instead, any new issues will be assigned their own unique alphanumeric designation.

The list of issues raised by your agency was developed from a master list which also contains the issues raised by a number of other agencies. Thus, your agency's list of issues does not necessarily contain issues from all

the subtask categories referred to above, nor do the issues on your list necessarily conserve strict numerical order within the subtask categories.

Your issues list indicates in abbreviated form the source used to identify each issue. At the end of this Appendix, we have provided a master bibliography with more complete information on each of the sources cited.

SUSITNA HYDROELECTRIC PROJECT: AGENCY-RAISED ISSUES

Subtask: Aquatic Resources

ALASKA DEPARTMENT OF FISH AND GAME

Page 1 of 11

ISSUE	SOURCE
A-5. Water quality effects of waste materials discharged into the river by communities and industrial operations downstream of the dam during construction and operation.	5. Dwight & Trihey 81 Survey
A-6. Temperature conditions in all reaches of the river affected by construction and operation.	6. Dwight & Trihey 81 Survey
A-7. Sediment levels and turbidity affected by construction and operation.	7. Dwight & Trihey 81 Survey
A-8. Effects of construction and operation of project on aquatic animal organisms.	8. Dwight & Trihey 81 Survey
A-9. Effects of construction activities on fishery resources in the access road corridor.	9. Dwight & Trihey 81 Survey
A-10. Effects of construction activities on fishery resources in transmission line corridors.	10. Dwight & Trihey 81 Survey
A-11. Effects of construction and operation on ice conditions upstream of the dams.	11. Dwight & Trihey 81 Survey
A-12. Effects of construction and operation on ice conditions downstream of the dams.	12. Dwight & Trihey 81 Survey
A-13. What is the life of the reservoir?	13. Dwight & Trihey 81 Survey
A-14. What effect will release of sediment and glacial flour to prolong the life of the reservoir (if this is done) have downstream?	14. Dwight & Trihey 81 Survey
A-15. Effects of operation of reservoir(s) on dissolved nitrogen concentrations downstream of dam(s).	15. Dwight & Trihey 81 Survey
A-16. Effect of altered flows on winter icing in Cook Inlet.	16. Dwight & Trihey 81 Survey

SUSITNA HYDROELECTRIC PROJECT: AGENCY-RAISED ISSUES

Subtask: Aquatic Resources

ALASKA DEPARTMENT OF FISH AND GAME

Page 2 of 11

ISSUE	SOURCE
A-17. Estuary impacts need evaluation.	17. Dwight & Trihey 81 Survey
A-18. Overwintering of resident and juvenile anadromous fish in the mainstem needs to be evaluated.	18. Dwight & Trihey 81 Survey
A-19. Impacts on access of juvenile salmon to east side tributaries below Talkeetna for rearing.	19. Dwight & Trihey 81 Survey
A-20. Water quality impacts downstream from Talkeetna.	20. Dwight & Trihey 81 Survey
A-21. Water quantity impacts downstream from Talkeetna.	21. Dwight & Trihey 81 Survey
A-22. Sediment transport conditions at the confluence of the Susitna, Chulitna and Talkeetna Rivers.	22. Dwight & Trihey 81 Survey
A-23. Adequate mitigation studies.	23. Dwight & Trihey 81 Survey
A-24. Impacts on rearing, fish passage, and egg incubation in the mainstem river from its mouth upstream.	24. Letter Trent to Carson Oct 13, 1980
A-25. A cost/benefit analysis of potential mitigation alternatives must be made.	25. Letter Trent to Carson Oct 13, 1980
A-26. Access of the public and commercial interests to fisheries provided by mitigation program.	26. Letter Trent to Carson Oct 13, 1980

SUSITNA HYDROELECTRIC PROJECT: AGENCY-RAISED ISSUES

Subtask: Aquatic Resources

ALASKA DEPARTMENT OF FISH AND GAME

Page 3 of 11

ISSUE	SOURCE
A-27. Access road impacts on fisheries including access for fishing.	27. Letter Trent to Carson Oct. 13, 1980
A-28. The entire length of the river should be evaluated for project impacts.	28. Letter Trent to Carson Oct. 13, 1980
A-29. Effects of T-Line corridor to maintain watershed integrity.	29. Memo from Yanagawa to Trent August 6, 1981
A-30. Effects of the alignment of T-Line corridors on aquatic resources.	30. Memo from Yanagawa to Trent August 6, 1981
A-31. Change in the bed characteristics of areas utilized by chum salmon for mainstem spawning.	31. Letter Trent to Weltzin Jan. 19, 1982 and April 16, 1982 Board testimony
A-32. Influence of changes to sediment transport patterns on productivity of the aquatic community.	32. Letter Trent to Weltzin Jan. 19, 1982 and April 16, 1982 Board testimony
A-33. Post-project effects on downstream turbidity.	33. Letter Trent to Weltzin Jan. 19, 1982 and April 16, 1982 Board testimony
A-34. The costs of aquatic mitigation specified.	34. Testimony before APA Board April 16, 1982

SUSITNA HYDROELECTRIC PROJECT: AGENCY-RAISED ISSUES

Subtask: Aquatic Resources

ALASKA DEPARTMENT OF FISH AND GAME

Page 4 of 11

ISSUE	SOURCE
A-35. Instream flows required to maintain present populations of fish below the two dams. The areas immediately below the dam sites as well as areas further downstream should be included.	35. Letter to APA Board July 27, 1982
A-36. Temperature regimes should be evaluated concurrently with stream flows.	36. Letter to APA Board July 27, 1982
A-37. Compare options for onsite mitigation of fisheries impacts with possibilities for hatcheries.	37. Letter to APA Board July 27, 1982
A-38. Impacts from construction and maintenance of the transmission corridor should be evaluated.	38. Letter to APA Board July 27, 1982
A-39. Impacts from construction and maintenance of access road corridor should be evaluated.	39. Letter to APA Board July 27, 1982
A-40. Grayling hatchery for impoundment losses.	40. Comments at December 2, 1982 Workshop
A-41. Slough modification plans.	41. Comments at December 2, 1982 Workshop
A-42. Instream flow analysis on sloughs to look at the mitigation options.	42. Letter to APA June 3, 1983
A-43. Instream analysis on side channels to look at the mitigation options.	43. Letter to APA June 3, 1983
A-44. Instream analysis on mouths of tributaries to look at the mitigation options.	44. Letter to APA June 3, 1983

SUSITNA HYDROELECTRIC PROJECT: AGENCY-RAISED ISSUES

Subtask: Terrestrial Resources

Page 5 of 11

ALASKA DEPARTMENT OF FISH AND GAME

ISSUE	SOURCE
T-1 <u>Downstream Effects</u> The assessment of the extent and severity of downstream habitat alteration needs to be refined. Need to continue hydrologic and vegetation succession modelling and additional field studies where necessary, in order to refine impact assessment and mitigation planning for downstream effects. Should use geomorphological cross-sections information and possibly monitor these cross-sections.	1. Testimony before APA Board 4/16/82 p.1 (FWS) Draft Ex. E Comments p. 34, 35, 37, 58 68, 69, 98 (FWS) Feb/Mar '83 Workshop Recommendation p. 155, 162 (FWS) Draft Ex. E Comments B-6, B-7 (ADFG) Feb/Mar '83 Workshop Recommendation p. 155, 162 (ADFG)
T-3 <u>Matrix Approach to Summarize Impacts/Mitigation Measures</u> Need to evaluate impacts and especially mitigation measures for each species relative to all others using a matrix format. Consider aquatic resources in this matrix analysis.	3. Draft Ex. E Comments p. 18-19 (FWS) Feb/Mar '83 Workshop Recommendation p. 163 (ADFG)
T-11 <u>Estimates of Project Area Recreational Use</u> Need better estimates of current and future recreational use of the project area.	11. Feb/Mar '83 Workshop Recommendation p. 154
T-16 <u>Traffic-related Impacts</u> Extent of and effects of increased traffic on various road and railroad segments have not adequately been evaluated and related to big game disturbance and collision mortality.	16. Draft Ex. E Comments p. B-52

SUSITNA HYDROELECTRIC PROJECT: AGENCY-RAISED ISSUES

Subtask: Terrestrial Resources

ALASKA DEPARTMENT OF FISH AND GAME

Page 6 of 11

ISSUE	SOURCE
T-18 <u>Secondary Effects of Improved Access</u> Effects of secondary development and increased recreational use resulting from improved access have not been fully evaluated.	18. Draft Ex. E Comments - p. B-6 (ADFG) Testimony before APA Board 4/16/82 p. 1 (FWS)
T-19 <u>Cumulative Impacts</u> Effects of cumulative impacts have generally not been adequately addressed.	19. Draft Ex. E Comments - p. 19 (FWS) Draft Ex. E Comments - p. B-5, B-55 (ADFG)
T-20 <u>Quantification of Impacts</u> In general, impacts have not been adequately quantified and determinations of significance have not been well-documented.	20. Draft Ex. E Comments - p. B-3 (ADFG) Draft Ex. E Comments - p. 17 (FWS) Testimony before APA Board 4/16/82 p. 1 (FWS)
T-21 <u>Impacts Based on Current Populations</u> Impact evaluations should be based on the range of population levels that could reasonably be expected to occur during the life of the project rather than on current population levels as is generally done.	21. Draft Ex. E Comments - p. B-3, B-4, B-5
T-28 <u>Snow Accumulation Data</u> Need data on snow accumulation by elevation in the upper Susitna Basin.	28. Feb/Mar '83 Workshop Recommendations p. 154

SUSITNA HYDROELECTRIC PROJECT: AGENCY-RAISED ISSUES

Subtask: Terrestrial Resources

ALASKA DEPARTMENT OF FISH AND GAME

Page 7 of 11

ISSUE	SOURCE
T-30 <u>Moose Browse Mapping</u> Need to provide a quantifiable data base for precise type and areal extent of moose browse within the direct impact area to support carrying capacity modeling.	30. Draft Ex. E Comments p. 45 (FWS) Feb/Mar '83 Workshop Recommendations p. 160 (ADFG)
T-34 <u>Moose Carrying Capacity Model</u> Need to conduct a habitat-based assessment of moose habitat loss/modification impacts as the basis for impact prediction and mitigation planning.	34. Draft Ex. E Comments p. 17, 18 52, 72 (FWS) Feb/Mar '83 Workshop Recommendation p. 161 (ADFG)
T-35 <u>Moose Habitat Enhancement</u> Need to evaluate techniques for increasing moose carrying capacity through habitat enhancement and identify candidate areas for habitat enhancement in order to mitigate for project-induced carrying capacity reductions.	35. Draft Ex. E. Comments p. 40, 72 (FWS) Letter 10/5/82 p. 4 (FWS) Feb/Mar '83 Workshop Recommendations p. 161, 162, 177 (ADFG)
T-36 <u>Moose Browse Inventory</u> Need to conduct a moose browse inventory in the impoundment areas to support the moose carrying capacity modeling efforts.	36. Draft Ex. E Comments p. 34 (FWS) Feb/Mar '83 Workshop Recommendation p. 160 (ADFG)

SUSITNA HYDROELECTRIC PROJECT: AGENCY-RAISED ISSUES

Subtask: Terrestrial Resources

Page 8 of 11

ALASKA DEPARTMENT OF FISH AND GAME

ISSUE	SOURCE
T-37 <u>Moose Food Habits</u> Need to conduct a limited moose food habits study to support the moose carrying capacity modeling efforts.	37. Draft Ex. E Comments p. 45 (FWS) Feb/Mar '83 Workshop Recommendation p. 160 (ADFG)
T-38 <u>Spring Plant Phenology</u> Need to determine the temporal and spatial pattern of spring plant green-up in and adjacent to the impoundment zones in order to assess the significance of this seasonal forage resource to moose and bear reproduction and carrying capacity and to assess the portion of the resource to be lost due to impoundments. Also, need this information to refine the evaluation of microclimate changes, due to the reservoirs, on spring green-up.	38. Draft Ex. E Comments p. 36, 53 (FWS) Feb/Mar '83 Workshop Recommendation p. 159, 160 (ADFG)
T-39 <u>Upstream Moose Field Studies</u> Need more data on moose numbers, herd composition, calf mortality and movements (especially during the critical winter and spring periods) relative to the impoundment areas to refine impact assessment and mitigation planning.	39. Feb/Mar '83 Workshop Recommendation p. 175, 176 (ADFG) Draft Ex. E Comments p. 47 (FWS)
T-40 <u>Downstream Moose Field Studies</u> Need more data on moose use of downstream riparian areas during winter and spring to refine impact assessment and mitigation planning, especially because of the annual variability in this use. Also need more data on moose population, sex, and age composition on the downstream disturbed sites.	40. Feb/Mar '83 Workshop Recommendation p. 177

SUSITNA HYDROELECTRIC PROJECT: AGENCY-RAISED ISSUES

Subtask: Terrestrial Resources

ALASKA DEPARTMENT OF FISH AND GAME

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ISSUE

SOURCE

T-41 Severe Winter Field Studies41. Feb/Mar '83 Workshop
Recommendation p. 177

Need to gather intensive data on moose distribution, habitat selection and wolf predation during a severe winter.

T-43 Wolf Field Studies43. Feb/Mar '83 Workshop
Recommendation p. 176

Need to gather more information on movements, territory locations, predation rates, etc., of wolves in upstream zone of impact to refine assessment and mitigation planning.

T-44 Black and Brown Bear Field Studies44. Feb/Mar '83 Workshop
Recommendation
p. 171, 172, 179,
180, 181 (ADFG)
Draft Ex. E
Comments p. 57, 63
(FWS)

Need to gather more information on habitat use (especially relative to the impoundments), denning habitats and availability of food habits to refine impact assessment and mitigation planning. Need to better evaluate importance of salmon to area bears. Overall, need to better quantify impacts and discuss cumulative impacts on brown bears.

SUSITNA HYDROELECTRIC PROJECT: AGENCY-RAISED ISSUES

Subtask: Social Sciences

ALASKA DEPARTMENT OF FISH AND GAME

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ISSUE	SOURCE
SS-15 The costs of educating the project-induced population need to be examined as well as the effects of the education costs on Mat-Su Borough tax rates.	15. Socioeconomic Workshop (19 July 1983)
SS-16 Impacts to fish and wildlife users have not been adequately addressed.	16. Letter to APA, 13 Jan 1983 (Vol. 10B)
SS-17 Some description should be provided on the relative importance of natural resource harvests as part of household income.	17. Letter to APA, 13 Jan 1983 (Vol. 10B)
SS-18 Indirect and direct impacts to commercial businesses dependent upon fish and wildlife resources are undefined.	18. Letter to APA, 13 Jan 1983 (Vol. 10B)
SS-19 Impacts to subsistence and recreation user groups and to fish and wildlife resources should be addressed.	19. Letter to APA, 13 Jan 1983 (Vol. 10B)
SS-20 A survey of community usage of wildlife resources by Cantwell residents would be useful in assessing levels of use and importance of salmon, moose, and caribou.	20. Letter to APA, 13 Jan 1983 (Vol. 10B)
SS-21 Additional assessment of user groups should be made for the domestic use of salmon.	21. Letter to APA, 13 Jan 1983 (Vol. 10B)
SS-22 The assessment of trapping activity and its importance to users in the Local Impact Area should be more extensive.	22. Letter to APA, 13 Jan 1983 (Vol. 10B)
SS-50 Effects of project construction and operation on instream flow as it relates to socioeconomics should be examined.	50. Dwight & Trihey 81 Survey

SUSITNA HYDROELECTRIC PROJECT: AGENCY-RAISED ISSUES

Subtask: Social Sciences

ALASKA DEPARTMENT OF FISH AND GAME

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ISSUE	SOURCE
SR-52 Many of the recreational use projections are underestimated.	52. Letter to APA, 13 Jan 1983 (Vol. 10B)
SR-53 Management of lands for public recreation and appreciation requires additional clarification.	53. Letter to APA, 13 Jan 1983 (Vol. 10B)
SR-54 The discussion of wildlife and recreation fails to address impacts to inundated tributaries to the Susitna River.	54. Letter to APA, 13 Jan 1983 (Vol. 10B)
SR-55 There is inadequate discussion of construction worker policies regarding use of recreation resources.	55. Letter to APA, 13 Jan 1983 (Vol. 10B)
SR-56 A definition of wildlife species and recreational uses is needed.	56. Letter to APA, 13 Jan 1983 (Vol. 10B)
SR-58 Discuss impacts on recreation to east-side tributaries below Talkeetna.	58. Dwight & Trihey 81 Survey
SR-78 Effects of project construction and operation on instream flow as it relates to recreation resources should be examined.	78. Dwight & Trihey 81 Survey
SA-83 Effects of project construction and operation on instream flow as it relates to aesthetic resources should be examined.	83. Dwight & Trihey 81 Survey
SL-84 Potential railroad impacts to land use and access downstream from Gold Creek should be addressed.	84. Letter to APA, 13 Jan 1983 (Vol. 10B)
SL-85 Proposed mitigation measures and their implementation need to be more clearly outlined.	85. Letter to APA 13 Jan 1983 (Vol. 10B)
SL-86 Proposed mitigation for the loss of public use of project lands should identify alternatives such as replacing opportunities lost with lands that provide equal value.	86. Letter to APA, 13 Jan 1983 (Vol. 10B)

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AD

MEMORANDUM

AD
02-83-13.06
State of Alaska
ESTES ✓

TO: Richard A. Lyon
Commissioner
Department of Commerce
& Economic Development

DATE: October 12, 1983

FILE NO:

TELEPHONE NO:

465-4180

FROM: Don W. Collinsworth *for me*
Commissioner
Department of Fish and Game

SUBJECT: Funding for ADF&G
Participation in
Hydroelectric
Project Planning

The magnitude on environmental modifications created by either the Susitna proposal or other hydroelectric projects will have far reaching consequences on this Department. I would therefore like to bring to your attention, as Chairman of the Alaska Power Authority Board, three items of concern to this Department.

1. The reduction in funding of several project elements of the Susitna baseline study.
2. The possibility of this Department receiving funds to provide proper review and evaluation of the Susitna hydroelectric project.
3. The Department's ability to provide overall review on all proposed hydro projects.

First, the loss of study elements caused by the decrease in funding within the Susitna aquatic studies and wildlife project may prevent the Department from making an adequate evaluation of the project impacts and advising on appropriate mitigation recommendations. We believe it is important for the State to have the information necessary to address impacts and mitigation properly. I have detailed in Enclosures 1-3 the proposed cuts, their consequences and recommended reinstatement priorities.

Second, I have concerns with respect to this Department's ability to provide overall review and comment on proposed Susitna Hydro activities. I propose that the Department be provided \$79,200 to prepare adequate policy level analyses and responses. Departmental involvement would focus on minimizing potential adverse impacts from hydroelectric development through analysis of the effects of construction and operation on fish, wildlife, habitat, and human use.

Third, the Power Authority routinely requests analyses and recommendations from the Department as an essential component of its evaluation of Hydro project development and operation on fish, wildlife, habitats, and human use (Enclosure 4). In order that the projects are conducted in a timely manner and with adequate concern for local resources, early, indepth analyses and comments to the Power Authority are essential.

October 12, 1983

We suggest that it may be useful for this Department and the Power Authority to enter into a memorandum of understanding which would define evaluation tasks and guarantee a level of funding necessary to carry them out.

I will not detail each proposal (except as enclosures) because Dr. Richard Logan, Director of the Sport Fisheries Division, will be present at your Board meeting to answer any questions you or the Board might have.

Enclosures

cc: Commissioner Casey
Director McDowell
Commissioner Wunnicke

bcc: Richard Logan
John Clark (HYD 3.0)
Carl Yanagawa

DWC:RL:sdb

SUSITNA HYDRO PRESENTATION

Aquatic Studies

Impact FY 84 Budget Reductions

Issue: ADF&G Aquatic Studies FY84 Program and Budget Reduction and their General Consequences.

Background: The ADF&G Su Hydro Aquatic Studies Team has made several iterations of program and budget proposals since March of this year. The first proposed program and budget submitted to the APA on March 8, 1983 was for about 4.0 million dollars.

Reductions in program to approximately \$3.0 million on June 10, 1983 had the following major consequences:

1. Eliminated continuing impoundment area fisheries work in streams which will be inundated and in the portions of the stream systems above future reservoir elevations. Stream habitat and fisheries above reservoir elevations have not been evaluated. This will result in a lack of information on the fishery resources which may be directly impacted by inundation or secondarily impacted by the improved public access to the project areas.

2. Eliminated the Fairbanks to Anchorage intertie corridor work. This will result in a lack of information on the fishery resources which may be directly impacted or secondarily impacted by improved access or construction activities into the project areas.
3. Eliminated lake survey work necessary to evaluate the assessment of primary and secondary impacts of the project on impoundment area fisheries. Secondary impacts from improved public access and increased human population and utilization on the area fisheries may be particularly important. These impacts will not be effectively evaluated and managed because of the lack of information.
4. Reduces the impoundment area access and transmission corridor work by 50 percent. That is, the geographic area we could effectively survey to provide information to mitigate primary and secondary impacts is one half of the necessary coverage.
5. Eliminates water quantity and quality data collection studies designed to support reservoir modelling studies conducted by project engineers. Without these data it is not possible to test or adjust the accuracy of computer models.
6. Eliminated pilot mitigation studies. Evaluation of the feasibility and effectiveness of certain mitigation techniques has been delayed.

7. Reduced the level of aquatic habitat and instream flow studies and resident and juvenile anadromous fisheries studies in the Devil Canyon to Talkeetna reach of the river. Impacts to aquatic habitat and the indigenous fish species at various flow increments will therefore be delayed or not determined.
8. Eliminated food habit and aquatic invertebrate studies in the Talkeetna to Devil Canyon reach. As a result we will not be able to assess whether project flows will affect the food resources of fish and whether post-project conditions will have beneficial or detrimental impacts on fish.
9. Eliminated the initiation of studies on effects of incremental flow on aquatic habitats, instream flow and resident and juvenile anadromous fish populations in the Susitna River below Talkeetna. FERC indicated in their deficiencies comments that an incremental analysis of flows is needed below Talkeetna. These studies are instrumental to the appraisal of impacts at various flows.
10. Eliminated the proposed Flathorn Station study site which would have quantified salmon escapements between river mile (RM) 25 to 77 in the Talkeetna to Cook Inlet reach of the river. The magnitude of the fish populations and production of salmon utilizing this portion of the river will not be determined.

The APA's proposed reduction of the June 10, 1983, program by an additional \$700K has the following consequences.

1. Eliminated the capability of the Aquatic Studies Program to reduce, analyze and report the 1983 open water season results at the same level as in prior segments. This will delay the process of quantification of impacts and will detract from the quality of impact assessment and mitigation planning by other environmental study participants. It also eliminates our ability to provide early provisional data transmittal requests on a case-by-case basis.
2. Eliminates winter temperature monitoring. This will affect the modeling and impact assessment efforts to determine if the river system may have enhanced or detrimental temperatures changes for fish.
3. Eliminates the slough and tributary incubation studies and other resident and juvenile anadromous fish work. Quantitative information to evaluate changes in flows and the impacts on sloughs or resident and juvenile anadromous fish will not be available to make necessary impact analysis and objective mitigation decisions.
4. Essentially eliminates the projects capability to effectively field productive 1984 open water studies in the spring required for the incremental evaluation of aquatic habitat and instream flow and of resident and juvenile anadromous populations. This program reduction will eliminate or postpone the open water field season programs after July 1. Consequently we feel that the review and licensing process may have to be postponed until these field programs are conducted.

5. Eliminates any further work on stream and lake fisheries along access corridors routes. This will affect the ability of the resource managers to: assess primary and secondary impacts from construction, improved public access and to mitigate these efforts through stipulations on the timing and method of construction or through regulation of the fisheries to avoid overfishing or other management problems.

Recommendations:

1. The ADF&G recommends, at a minimum, the restoration of \$418.7K to support item number one programs listed in the Priority One list, (Table 1).
2. Restoration of the remaining Priority One studies, (numbers two through five) to restore:
 - a. data analysis, and reporting capabilities to the extent possible at this late date.
 - b. capabilities to have a functioning field program in the Devil Canyon to Talkeetna reach of the river during the open water field season in 1984.

Total reinstatement of Priority One items would amount to \$645.9K including the additional administrative costs.

3. all Priority Two items to provide for assessment of fish habitats and instream flow and fish populations down stream of Talkeetna. These funds and programs were basically eliminated from our March 8, 1983 proposal and the funds would be dedicated to the start of data collection in the 1984 spring open water field season.

AQUATIC STUDIES

PRIORITIZATION TABLE OF FY 84 FUNDING REINSTATEMENT REQUESTS FOR AUGMENTING EXISTING FUNDING LEVELS

<u>Priority One</u>						<u>Priority Two</u>					
1.	<u>AH</u> A,B	<u>RJ</u> A	<u>DP</u> A-E	<u>Helicopter</u> 94 hrs	Total Add'l. Cost \$418.7K	1.		<u>RJ</u> A	Total Cost \$ 91.9K		
2.		<u>RJ</u> B		94 hrs	107.7K	2.	<u>AH</u> A	<u>RJ</u> B	<u>DP</u> A	128.5K	
3.		<u>RJ</u> C			22.9K	3.		<u>RJ</u> C,D		91.8K	
4.		<u>RJ</u> D			26.4K	4.			AA	20.0K	
5.	<u>AH</u> C	<u>RJ</u> E			45.2K						
6.	Administrative Costs				25.0K						
TOTAL					\$645.9K	TOTAL					\$332.2K

KEY TO PROGRAMS LISTED IN PRIORITIZATION FUNDING REQUEST TABLES ABOVE

Aquatic Habitat and Instream Flow Studies (AH)

Priority One Programs

A.	Fish Habitat Studies (FHS) Talkeetna to Devil Canyon	\$129.5K
B.	Instream Flow and Evaluation Studies (IFE) Cook Inlet to Impoundment	86.2K
C.	Quality Assurance and Laboratory Operations (QuALO)	17.5K \$233.2K

Priority Two Programs

A.	FHS - Cook Inlet to Talkeetna	\$ 80.0K \$ 80.0K
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Anadromous Adult Studies (AA)

A.	Pilot Mitigation Studies	\$ 20.0K \$ 20.0K
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Resident and Juvenile Anadromous Studies (RJ)

Priority One Programs

A.	Juvenile Anadromous Habitat Studies (JAHS) - Devil Canyon to Talkeetna	\$ 80.8K
B.	Resident Fish Studies Devil Canyon to Talkeetna	73.7K
C.	Emergent and Outmigrant Juvenile Anadromous Studies - Devil Canyon to Talkeetna	22.9K
D.	Access and Transmission Corridor Study	26.4K
E.	Additional Quality Assurance and Support	27.7K
		<u>\$231.5K</u>

Priority Two Programs

A.	Emergent and Outmigrant Study Cook Inlet to Talkeetna	\$ 91.9K
B.	Juvenile Anadromous Habitat Studies and Resident Fish Studies - Cook Inlet to Talkeetna	29.0K
C.	Access and Transmission Corridor	41.0K
D.	Quality Assurance and Support	50.8K
		<u>\$212.7K</u>

Data Processing and Cartography Support Unit (DP)

Priority One Programs

A.	Cartography Support	\$ 9.6K
B.	Programming Support	20.9K
C.	Liaison and Quality Control	4.3K
D.	Additional Programming Support	25.8K
E.	Data Entry and Control	27.6K
		<u>\$ 88.2K</u>

Priority Two Programs

A.	Data Entry, Control and Cartography Support	\$ 19.5K
		<u>\$ 19.5K</u>

SUSITNA HYDRO PRESENTATION

Reinstatement of Aquatic Studies

Downstream of Talkeetna

Issue: Proposed funding and the potential for fisheries and aquatic habitat impacts by the proposed Susitna Hydroelectric Project downstream of the Chulitna, - Susitna - Talkeetna rivers confluence.

Background: The Alaska Department of Fish and Game (ADF&G) has been on record since 1974 that potential Susitna Hydroelectric Project impacts need to be assessed from the prospective dam sites downstream to the Cook Inlet estuary. This view was reiterated in ADF&G's November 1979 proposal to the Alaska Power Authority (APA) for fish and wildlife studies.

Geographic priorities for study established by the APA in 1980 were as follows:

1. Impoundment areas below peak reservoir elevations.
2. Devil Canyon dam site to Talkeetna reach of the river.
3. Talkeetna to Cook Inlet reach of the river.

In 1981 and 1982 the funded field studies worked toward quantification of the aquatic resource impacts in the first two priority areas. Work in the third priority area was funded at a reconnaissance level. Reconnaissance level work is designed to provide preliminary information for future use in delineating

appropriate integrated studies. Because of the general nature of the data collected by the reconnaissance surveys, this information, from Talkeetna to Cook Inlet, cannot be used to provide for any quantifiable impact assessments.

In 1983, APA requested ADF&G to focus programs on aquatic resource impacts and issues in the Devil Canyon to Talkeetna reach of the Susitna River. Presently, no fisheries or aquatic habitat work is directed toward quantifying fishery and aquatic habitat impacts in the Talkeetna to Cook Inlet reach of the river.

ADF&G feels that work in the Devil Canyon to Talkeetna River reach, must continue to focus on programs which will provide quantification of resource impacts. However, we believe the question of impacts downstream of Talkeetna should not be left to a judgemental evaluation of reconnaissance level data. For example, an impact that might affect 10 percent of the fish below Talkeetna may be equivalent to an impact affecting 100 percent of the fish above Talkeetna. It is technically possible to provide data which will enable a much improved assessment of aquatic resource impacts below Talkeetna.

In the ~~opinion of the APA, critical impacts will not occur in this reach.~~ In the ~~opinion of the ADF&G, there is not a substantive base of information to~~ make that judgement nor establish the level or extent of impact. Unsubstantiated judgement of impacts is unacceptable to ADF&G; the goal should be to quantify impacts to the best extent possible.

Recommendations

1. Multidisciplinary studies in hydraulics, hydrology, fisheries and aquatic habitat in the Talkeetna to Cook Inlet reach of the Susitna River must be begun as soon as practicable.

The goal of the studies should be to proceed from a reconnaissance level to a qualitative, and then quantitative level of impact assessment consistent with state-of-the art techniques and study methods.

Flow releases for fisheries and aquatic habitat, wildlife, and navigation impact mitigation cannot be negotiated, until the State and federal agencies and the public fully understand the consequences of the operational flows from the Susitna Hydroelectric Project dam sites to Cook Inlet.

Susitna Hydroelectric Project

Big Game Studies

Issue: Game studies FY 84 program and budget reductions.

Background: At the start of the Susitna Project, it was anticipated that it would take about five years to produce an adequate assessment of the impacts on wildlife. This time frame assumed a carefully designed, well documented, interdisciplinary approach. We believed it would take about two years to learn enough about local wildlife populations to identify impact mechanisms and develop hypotheses. The next three years were to be used to evaluate these hypotheses and quantify impacts. Annual variation in factors such as winter severity also required that some activities be repeated for at least five years.

Unfortunately, a carefully designed, well documented approach was not developed and interdisciplinary coordination was poor. In particular, needed vegetation and hydrology information was either not collected or was of insufficient quality to support an assessment of impacts on wildlife. ADF&G pointed out the problems repeatedly but could do little more, as the hydrology, vegetation and impact assessment were the responsibility of other contractors. Virtually nothing was done to improve the situation until mid-1982 when new consultants (LGL) took over the impact assessment.

The new consultants improved the level of coordination substantially and tasks were identified to resolve some of the major deficiencies. Some key issues such as downstream effects on moose habitat were not adequately addressed and no system for organizing and documenting the impact assessment was developed.

It was at this stage that the license application was written. In general, data collected after fall 1981 were not included and the improved coordination had not yet produced results that could be incorporated. Consequently, the wildlife sections of Exhibit E are incomplete, contain much unsubstantiated speculation, and present very little quantification. They do contain many specific promises of continued study and refinement of impact assessment.

Current Status

Wildlife studies have progressed to a point where it is likely most of the potential impact mechanisms have been identified. However, there is some doubt, and in some cases complete disagreement, as to the significance of some of the mechanisms which could require major mitigation as conclusions have been based on hypotheses that have not been adequately tested. Few mechanisms have been quantified in a meaningful manner. In many cases, it is impossible even to assign an order of magnitude to the impact. Many mechanisms are likely to work in concert with other mechanisms resulting in a greater cumulative impact on wildlife populations. Preliminary simulation models have been developed in an attempt to organize impacts so their cumulative effects can be examined. However, these models have not yet produced results.

Before an acceptable impact assessment can be completed, there needs to be a systematic identification of potential impact mechanisms. Each mechanism needs to be evaluated. Those impacts that appear serious and may require specific mitigation measures need to be quantified to the extent practical. Finally, these impacts need to be viewed together so that reasonable predictions of what will happen to wildlife populations if the project is built can be made and a workable foundation for mitigation planning can be laid.

Much of what needs to be done requires only careful planning and analysis of available data. However, there is still a need to conduct field studies to determine annual variation, particularly in factors influenced by winter severity, and to quantify specific habitat and population parameters.

Effect of "Full" FY 84 Funding

The so-called "full" FY84 funding would have provided ADF&G with \$1,000.0 plus a \$98.4 severe winter contingency fund and other contractors with sufficient funds to plan and document the program, conduct specific vegetation study tasks identified in a series of coordination meetings and to continue development of models.

98.4K?? million?

This level of funding, if accompanied by good planning, would have preserved the progress made in FY83. Substantial progress would have been made on some of the major impact issues although some of these will not be resolved until 1985 regardless of funding. There would still be some major issues that would not be addressed. Therefore, the "full" funding would have allowed significant progress toward impact assessment, but would not have allowed its completion.

Effect of Current Funding

The current funding level is not likely to significantly advance the licensing process for the following reasons.

1. Exhibit E makes specific promises of continued studies and refinement of impacts. Failure to fulfill these promises is likely to undermine APA's credibility with FERC. Few of the studies identified will be fulfilled with the present budget.
2. APA's failure to systematically plan and document their program has been a chronic problem. They simply don't know what still needs to be done. The progress that was made in FY83 has already been undermined. Little planning or coordination has been done since April. This is not entirely a budget problem. The only time progress was made was during LGL's brief tenure as the consultant responsible for terrestrial impact assessment. Momentum was lost when LGL moved to a subservient role to Harza-Ebasco. Harza-Ebasco has provided little direction to the program. Under the current budget the consultants will not be able to devote enough manpower of the proper caliber to ensure adequate planning and documentation.
3. Specific vegetation tasks were identified during coordination meetings in FY83 and mentioned in Exhibit E. They include a phenology study, a pilot browse study, a moose food habits study, vegetation mapping and intensive browse sampling. Current funding levels will not even allow analysis of existing data. Personnel who collected the data are on the verge of seeking other employment. Money spent in 1983 will be in part wasted and planned FY85 work compromised.
4. ADF&G's big game studies have been cut back to a level where there is a substantial risk that we will not be able to detect changes from previous years. This is important because we have seen major changes in how moose and bears use the impoundment areas each year, indicating that we do not

yet fully understand the importance of those areas. We have had a series of moderate or mild winters. There will be a major setback if we have severe winter and fail to detect it or be unable to evaluate it.

Continuity is important. Batteries in radiocollared animals will run down whether data are being collected or not. If we "put off" data collection a year it will be necessary to re-collar animals. This will increase project costs substantially and because of the seasonality of the work could delay results more than one year.

Recommendations

ADF&G should be funded at the full \$1,000.0 plus a \$98.4 severe winter contingency fund level shown in the RSA. The University of Alaska should be given adequate funding to complete the plant phenology, pilot browse and moose food habits studies. New vegetation maps should be produced. Most important a systematic planning effort should be initiated to document the status of the program, identify further needs and guide mitigation planning. This planning effort requires a greater commitment than has been demonstrated by APA or Harza-Ebasco.

Alternative 1

The minimum funding level to prevent loss of current investments and get the program on track would be to fund items 1-5 on the attached list, fully implement planning and documentation and fund data analysis and reporting writing on the plant phenology and pilot browse studies.

Alternative 2

An intermediate approach that would preserve ongoing work without starting new studies entails Alternative 1 plus reinstatement of items 6 thru 11 and the remainder of the vegetation tasks. (Items 12-15 can be delayed one year without harming other aspects of the program.)

Big Game

The following are items deleted from the FY84 big game study budget to reduce the budget from 1,000K to 700K. They are listed in the order in which they would be reinstated. Several projects have been reduced by percentages increasing the risk of failing to meet objectives.

	Cost (x\$1000)
1. Increase the level of monitoring upstream moose to 80% of the level necessary to reliably document winter and spring movements and habitat selection in the immediate vicinity of the impoundments.	33
2. Increase level of data analysis and reporting to a level that will support improvement of the impact assessment and modelling effort.	20
3. Increase the level of monitoring of upstream bears to 85% of desired level.	15
4. Census moose in the upstream primary impact zone.	20
5. Reinstate monitoring of downstream bears.	7
6. Caribou calf survival count.	5
7. Increase monitoring of downstream moose to the level necessarily to reliably document changes in winter and spring movements and habitat selection.	25
8. Increase upstream moose monitoring to 100% of of desired level, as above.	15
9. Increase bear monitoring to 100% as above.	25
10. Increase caribou monitoring to level necessary to reliably detect major movements in the vicinity of the impoundments and access routes.	12
11. Reinstate wolf program at minimal level necessary to determine size of currently marked packs.	23
12. Moose calf mortality study.	35
13. Evaluate moose use of downstream disturbed sites.	45
14. Caribou census	10
15. Intensive monitoring of bears to support calf mortality study.	10

The below information of the final bid tabulation for the ALASKA HUNTER
SAFE-RESPONSIBLE embroidered emblems is furnished per your request.

Branded Emblem Co.
7920 Foster
Overland Park, KS. 62204
(913) 648-7920
3,000 .27 each
4,000 .25 each

Gemco Inc.
Box 532
Milford, CT. 06460
(203) 877-0305
3,000 .295 each

National Embroideres Emblem
Box 4762
Carson, CA. 90745
(213) 537-4900
3,000 .30 each
5,000 .27 each

Swissartex Emblem Inc.
Box 8093
Ashvillen, NC. 28804
(704) 645-7281
3,000 .318 each

A-B Emblem
Box 695
Weaverville, N.C. 28787
(704) 645-3015
3,000 .322 each
4,000 .299 each
5,000 .277 each

Chicago Embroidery
1715 West Ohio St.
Chicago, IL 60622
(312) 666-4232
3,000 .45 each

Kroesen Inc.
1514 2nd Ave.
Seattle, WA. 98101
(206) 622-3853
3,000 .49 each

Thank you.

Sincerely,

Joseph S. Tamas
Purchasing Coordinator
(907) 267-2208

AE

MEMORANDUM

State of Alaska

TO: Richard E. Logan
Director
Sport Fish Division - Juneau

DATE: November 23, 1983

FILE NO: 02-83-13.0

TELEPHONE NO:

FROM: Thomas W. Trent
Aquatic Studies Coordinator
Su Hydro Aquatic Studies - Anchorage

SUBJECT: Su Hydro Coordination

During our telephone conversation of November 16, I suggested you consider an alternative to the Su Hydro coordination which had been proposed by John Clark, Director of the Habitat Division, and yourself on November 8. At that time, both of you indicated that 58.0K would be withdrawn from the ongoing Game Division and Su Hydro Aquatic Studies to fund a coordination position within the Habitat Division. This position would address Alaska Power Authority (APA) and agency coordination needs for the Su Hydro Project.

While you suggested that funds should be available from ongoing projects, I stated that withdrawal of these funds would affect implementation of field study objectives and tasks. These tasks and the funding allocated to execute them have already been agreed upon by the APA as being necessary to support Federal Energy Regulatory Commission (FERC) licensing activities for this fiscal year. I am therefore concerned that this revision in funding which you and John Clark are considering would require us to revise our existing field program objectives or tasks already established in accordance with our June 10, 1983 Reimbursable Service Agreement (RSA) with the APA and the recent budget reiteration completed October 28.

As I noted to you last week the withdrawal of about 40.0K from our budget as part of the 58.0K needed for Habitat Division is one of two unplanned reductions out of our recent budget submission to the APA on October 28. In the two day scurry to revise the budget, the Anadromous Adult Project inadvertently reduced their budget 31.5K too much due to an underestimation of expenditures to date. This problem had been brought to the APA's attention on November 8 and Richard Fleming had indicated that the APA and ADF&G/Su Hydro would try to work that problem out. The result of this error is that the Anadromous Adult Project still would be turning back over 30.0K of unexpended funding as opposed to an incorrect calculation of 61.5K. The unutilized \$30.0K to be refunded resulted from a smaller fish run this past summer season and hence reduced staffing needs. Accordingly, we planned to tighten our belts project wide to try and cover the 30.0K error if we could not arrive at an accommodation with the APA. However, with the added 40.0K reduction, our potential budget reduction has risen to 71.5K. This definitely has consequences for our program and agreed upon objectives, and comes following the efforts of my staff to reincorporate 400.0K into our program budget as directed by the APA.

Earlier, there may have been the option of negotiating the 58.0K for Habitat Division as an inclusion with the FY84 additional program budget submitted by ADF&G Su Hydro. This additional program budget will be considered by the APA Board of Directors on November 30, 1983. The letter from Commissioner Collinsworth to Richard Lyon, Commissioner of the Department of Commerce and

Economic Development and Chairman of the APA Board of Directors on October 12, 1983 made reference to the possibility of obtaining coordination funds, which now may be foregone as an additional item.

The alternative which I proposed to you involved retaining the 58.0K in the field study programs, and reinstating the coordination role of the Su Hydro Aquatic Studies Coordinator. This role was removed from this year's RSA under the direction of an agreement between yourself and Richard Fleming of the APA this past spring.

The most frequent argument for our separation has been the APA's opinion that separation of field data collectors from any regulatory responsibility is necessary to avoid a "conflict of interest". Why this separation avoids a conflict of interest is not clear, as ADF&G and many other agencies often collect and analyze field data for management purpose for which they have major regulatory responsibilities. Another stated reason is that the dilution of the staff into regulatory activities may decrease the quality of the field work and data analysis. This agreement would justify support of additional personnel to handle the regulatory burden but does not appear to be consistent with the insistence of APA to have the Su Hydro study team totally removed from the department's regulatory activities. In my opinion some of the "non-stated" reasons for removal of our former coordination and policy/position recommendation roles in the RSA are as follows:

1. The APA recognized that the impact analysis and mitigation planning conducted by other contractors was inadequate, and that by isolating ADF&G Su Hydro from other ADF&G offices, the technical information and background contributing to commentary on ADF&G position and policy or about technical defects would be greatly diminished. Other Departmental offices expected to do reviews would be pressed by time and lack of sufficient background into preparing less adequate reviews. Unresolved issues would have a greater chance of being missed. The APA is well aware, I believe, of the deficiencies in their environmental program and license application and has been hoping the resource management agencies will fail to recognize them or fail to have a consistent follow-up.
2. The APA recognizes that the ADF&G Su Hydro Aquatic Studies Team has the full capability, knowledge, and expertise to go beyond our field data collection role and the analysis of pre-project conditions to the analysis of impacts, and recommendation of potential mitigation opportunities and alternatives. They know we can do this with minimal effort as a result of our day to day experiences and technical knowledge. Obviously, no one can duplicate our three years of experience and have a handle on the potential impacts as does Su Hydro staff. For the Department to fully and adequately make a factual translation of project impacts and integrate technical facts and information into the more general concerns or issues of the management divisions it must be provided that communication with our group is possible on a routine basis.

The APA was distressed last spring by the input of my staff and myself in the review of the Exhibit E provided to the Habitat Division and staff of the management divisions in Region II. That review would not have been as

substantive without our input nor would our input have been as constructive without the review and input performed and provided by regional staff. The "gag rule" in place now is an effective strategy by the APA to minimize their environmental program and eventual mitigation responsibilities by dividing ADF&G offices and information sources.

3. At the recent coordination meeting between State and Federal Resource agencies on November 3, 1983 you heard Keith Bayha relate how the report by U.S. Fish and Wildlife Service (USFWS) lauded the Terror Lake Hydro project settlement process, but indicated one short fall, that is their record of communications.

The APA has been fully aware of the involvement of myself and other of my staff members in roles directly related to Su Hydro extending back to 1974. I do know our record of communications going back to 1974 has been substantive and consistent in the presentation of issues, policies, and positions. This consistency has occurred through the administrations of three Governors and three Departmental Commissioners. I think the record of the Department's positions has been apolitical and has represented rational resource concerns.

This is a record which I think can be maintained and inconsistency on the ADF&G's part at this time would be unfortunate. Continuing the "gag rule" can also be viewed as a means to produce departmental inconsistency by suppressing formal communication with myself and my staff who have an extensive historical knowledge of the Department and Su Hydro in its many facets.

The current RSA has resulted in a situation where ADF&G effectively has tied one hand behind its back. I do not believe it is a conflict of interest for us to participate in field data collection or for the interpretation of that data to be passed on to ADF&G regional management division offices. If this is truly a state project, not an APA project, our responsibility as a state agency is to bring the impact issues forward not be a party to their concealment.

During a meeting with myself and the Su Hydro project leaders in October, you discussed with us the possibility of the coordination role being returned to Su Hydro, and also the possibility of our potential involvement with other hydro projects. Both of these concepts were advanced in Commissioner Collingsworth's letter of October 12, 1983 to Richard Lyon, Chairman of the APA Board of Directors. In light of the current proposal to fund a Habitat Division position, we are interested in knowing if we have your support in furthering the development of these concepts of ADF&G coordination and direct participation Sport Fish Division and Commercial Fish Division in APA sponsored hydro projects.

cc: S. Pennoyer
A. Kingsbury
D. Watsjold
K. Schneider
Project Leaders

AF

MEMORANDUM

State of Alaska

AF

TO: Richard Logan
Director
Sport Fish Division - Juneau

DATE: January 13, 1984

FILE NO: 02-84-13.0

ESTES ✓

TELEPHONE NO:

FROM: Thomas W. Trent
Aquatic Studies Coordinator
Su Hydro Aquatic Studies - Anchorage

SUBJECT: Observations On The Alaska
Power Authority - Alaska
Department Of Fish And Game
Meeting In Juneau of
December 15, 1983.

As you suggested I am communicating several concerns and observations regarding the meeting held in Juneau between the Alaska Power Authority (APA) and Alaska Department of Fish and Game (ADF&G) on December 15, 1983.

TERROR LAKE PROJECT

The discussion by APA provided a picture of the Terror Lake negotiation process between the Federal Energy Regulatory (FERC) applicant and U.S. Fish and Wildlife Service (USFWS), which seemed to give credit to them for the way in which the settlement was reached. Some clarification regarding these negotiations is important to make.

These are:

1. Negotiations were carried out between Kodiak Electric Association (KEA) and the USFWS, not between the APA and USFWS.
2. USFWS had a major influence on the applicant because the hydro project was constructed in a federal refuge, the first project of this type in a federal refuge anywhere.
3. Keith Bayha of USFWS at a recent meeting has conceded that one deficiency of their negotiations was the lack of documentation. As a result some points they thought they'd gained were lost because of the lack of written documentary evidence of agreement.
4. In the report "Conducting FERC Environmental Assessment: A Case study and recommendations from the Terror Lake Project" prepared by Stewart Olive and Berton Lamb of the USFWS under a cooperative agreement with the U.S. Department of Energy, APA, ADF&G, and Region 7, USFWS, it is stated in the section on "A Summary of Strategies":

"Alaska Power Authority

The role of APA can be characterized as "interested observer." APA was evolving from a funding agency to a construction and management agency. The legislature was in the process of passing the statutes necessary to complete this transformation. APA anticipated responsibility for constructing projects similar to Terror Lake.

APA's motivation in the negotiations was to limit the concessions that KEA had to make, while providing support for the project. At the base of APA's strategy was establishing the precedent of limiting the number of concessions and extent of mitigation necessary to have projects approved in Alaska. Despite this interest, APA was not actively involved. The fact that APA observed this process is important because APA now administers the Terror Lake Project and is negotiating for a FERC license on the Susitna River Project." (The underlining is mine).

Susitna Hydro Issues

At the time I started this memorandum, I had not received the December 23 memorandum from John Clark transmitting the summary of the meeting between APA and ADF&G in Juneau on December 15, 1984, which just came. My comments hereafter relate to those minutes.

Item 6.

The proposed deadline of the end of the settlement process practically insures administrative hearings in my view. A competent assessment of impacts and a satisfactory mitigation plan will not be available by that time, is my opinion. Studies to define instream flow needs below Talkeetna are just beginning in FY85. Will instream flows be negotiated without the information from that program? Also, more than one year of work may be needed for that areas before satisfactory conclusions can be drawn.

Item 9.

While in Juneau for the December 15 meeting I expressed some reservation regarding the submission of a list of issues at the meeting that might be constructed as being "blessed" or "embraced" by ADF&G. John Clark did, however, in the meeting provide some qualification to the use of the list, I do not recall his exact words but believe qualification is necessary for the following reasons:

1. The list of issues transmitted by Habitat Division are a compilation or reorganization of an APA developed list of issues and a "brainstorm" list by USFWS staff.
2. The APA list of issues is historically incomplete and largely ignores a large volume of written documentation on issues and questions emanating from the ADF&G Commissioner's office. The APA list relies more on ADF&G staff level correspondence or information retrieved in interviews with ADF&G staff that can be termed "brainstorming" of potential issues or impacts.

I think it is as important to document not only the how, why or what of the issues but also the who or source of this issue commentary. ADF&G should develop a list of issues based on policy or position statements (at a minimum from 1977 on) from the Commissioner's office or from delegated spokesman not from the APA list. While we are not intervenors, I believe it is incumbent on ADF&G to formalize and document its own list of issues based on the highest administrative level of their presentation to the APA and with an accurate chronology of presentation. The APA list and consequently ADF&G's

are particularly weak on the subject of mitigation, for which ADF&G has had much more to say at the policy and position level in prior correspondence.

Our Commissioner should not be in the position of explaining how a staff member's informal comments became issue positions which may contradict correspondence from his office about the same issue. Adopting APA's list without thorough development or our own list and comparison against that list may lead to this. The potential for litigation requires that our formal record on issues, policies and positions is complete.

The Habitat position funded by APA has an excellent task ahead of it, that is to compile and document ADF&G issue, position, and policy statements from the original sources.

Regarding the identification of impact mechanisms. I think, this is a good idea. The problems is that the project engineers have not yet decided what the project is going to be like or the general operating scenerio. Identification of impact mechanisms in the aquatic environment is quite dependent on their deciding how the project will be generally operated, e.g., base load or peaking operation.

Item 10.

The representatives of ADF&G should be fully aware of ADF&G's prior policy, position, and issue documentation as indicated under Item 9. This is an ADF&G list that is accurate, historically, and chronologically complete.

Item 11.

If APA had done their homework, it would be evident that they largely have this information from former policy, position or issue documents from ADF&G. Lowenfels, for example, prepared a report a couple of years ago which incorporated material on agency mandates.

Item 12.

I believe APA is still intent on maintaining the "gag rule" on communications. You heard the discussion at the meeting suggesting they were trying to determine if our reports are public documents and also the discussion about making material available to intervenors under the "rule of discovery". Short and sweet, this means to me, if you don't know about it we are not making it available, and consequently your analytical and decision making process will not be as informed. This would be a cumbersome and aggravating process, and I predict would serve only to cause delays in the settlement process.

One question I have which was not asked at the meeting is: Since ADF&G is not an intervenor will it be afforded the same privileges of obtaining information as other agencies that are? Also, because ADF&G is not an intervenor why are they so concerned about information that is transmitted from ADF&G Su Hydro to the management divisions? We have information that is quite useful for in-season management of commercial fisheries, for example.

AG

AG

ESTESV

02-85-13.13
02-85-2.0

February 13, 1985

Mr. Larry Gilbertson
Aquatic Group Leader
Harza-Ebasco Susitna Joint Venture
711 H Street
Anchorage, Alaska 99501

Dear Mr. Gilbertson:

Please find attached our comments on the draft Long-Term Aquatic Monitoring Plan.

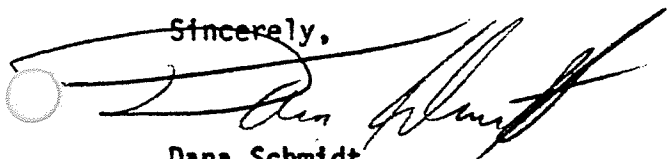
In general, the plan needs a better definition of purpose and objective. The plan is not solidly defined and leaves the reader pondering the question of impact assessment. Before a plan such as this is drafted an assessment of the impacts related to the project are needed. As of yet there appears to be no clear assessment provided in this or previous reports.

A major shortcoming in our view, is the lack of a clear resident fish monitoring program in the middle river and in the impoundment. We feel that the adult and juvenile salmon programs will not provide sufficient overlap for resident species in the middle river. The lower river monitoring requirements also need to be addressed. There also needs to be a program to monitor impoundment grayling and other species in lateral lakes and streams as project (construction) personnel and other incidental activities will impact resident species.

The discussion on heavy metals needs improvement. We suggest that more discussion of the need for this program and an improved analysis of potential problems be prepared before the monitoring program be developed.

If we can be of additional assistance, please feel free to call on me.

Sincerely,



Dana Schmidt
Acting Aquatic Studies Coordinator
Su Hydro Aquatic Studies
Department of Fish and Game
(907) 274-7583

cc: Project Leaders
L. Bartlett
A. Bingham
E. Marchegiani/APA
R. Fleming/APA

February 13, 1985

ALASKA DEPARTMENT OF FISH AND GAME
SUSITNA HYDRO AQUATIC STUDIES

SPECIFIC COMMENTS TO
DRAFT LONG-TERM MONITORING PLAN

WRITTEN BY

HARZA EBASCO SUSITNA JOINT VENTURE
JANUARY, 1985

page, paragraph

comment

1, 1 Construction is scheduled to begin pending issuance of a license...

The term natural conditions may be better stated as pre-project conditions throughout the plan text.

1, 2 Will the impacts be unique to each phase of the project relative to the pre-project conditions, or what? There are no impacts associated with the pre-project condition.

2, (1) Assess the potential efficiency....

2, (1) This document only addresses...

2 (3) If impacts are to be assessed, wouldn't they be actual impacts? A monitoring program would study actual impacts while an instream flow or other impact program would assess potential impacts.

2, 2 Why are impacts being assessed in a monitoring plan?

Monitoring of impacts for operation only does not agree with the last sentence in this paragraph but if it is meant as it reads, more detail on the pre-project and construction phases should be given.

Only the middle reach is discussed in detail in the text of the plan. Perhaps it should be made clear here that the plan will address only those impacts that affect the middle reach. If potential impacts are identified in the lower river, the monitoring plan will require some expansion.

General Comments on Section 1.0

This section confusing as worded. It does not adequately describe the background behind the development of a aquatic monitoring plan or how it will fit into the license or settlement processes.

3, 1 Isn't the IFRR report by EWT&A supposed to provide an understanding which impacts need to be monitored? If not, is this plan intended to assess impacts? If it is intended as an impact assessment, it is not adequate for that purpose.

3, 2 The purposes of the monitoring program is to:

verify pre-project impact predictions.

How do the first and second objectives differ?

if necessary, provide input to refine operations and mitigation measures.

provide supplemental baseline information to evaluate impacts and mitigation options.

3, 3 How many objectives are there? The section on purposes reads like the objectives.

Is the final plan part of the settlement or licensing process or both?

3, 4 When will an open workshop be held? A schedule of events is needed.

4, 2 The length of time and the data requirements needed for pre-project monitoring will depend...

4, 3 Will the parameters which are important and which are good indicators be the same? Who will decide which are important and good indicators? Does only readily measured and analyzed parameters imply that expensive or difficult parameters to measure (if needed) will not be measured?

5, 1 Only the pre-project monitoring program relative to this plan will begin in 1985. Data applicable to the program has been collected over the past several years.

An appendix summarizing the previously collected data should be included.

If the schedule will address only the specific parameters mentioned in the plan it should be stated here; or the state specific parameters mentioned to avoid confusion.

- 5, 2 Up to page 5 there has been no clear statement of what projected impacts are being discussed so how can they be confirmed?

Who will decide if mitigation measures require modification? Will there be a committee to decide this and agree on specific modifications? Will the resource agencies be on any committee; formed for this purpose?

- 5, 3 After rectification of "severe impacts", a decrease in field study can only be justified after long-term monitoring of the modification result is complete.

Does this paragraph mean to say that only significant or severe impacts will be corrected? Again, who makes these decisions?

When will the monitoring program schedule be available?

6, 1 What is meant by acceptable limits? Is this the no net loss mentioned on page 28, paragraph 4?

6, 2 4. Mercury/heavy metals. How can you monitor something that has not been completely assessed?

Upwelling should be a 5th category to the water quality list.

There should be a resident fish program to monitor rearing populations and mainstem overwintering. A program for resident fish need not be large but it does need to be considered.

8, 2 concentration can exceed...

The sentence on the decay rate below Devil Canyon is not true. The slopes (figure 2) are not significantly different.

8, 3 Additional pre-project data?

11, 2 How will the effects of spillway discharge be evaluated? Do we wait for the 50 year flood mentioned on page 7, paragraph 4?

An additional objective should reassess mitigation actions if necessary.

11, 3 Concentrations previously collected.

Testing and operation of the cone values at both Watana and Devil Canyon dams.

12, 1 Continual monitoring at Curry is not needed. A decay rate profile can be obtained by floating the river at various discharges.

12, 4 Dissolved gas sampling over a full range of with-project flows has already been completed.

13, 1 What affect, if any, will power house flows have on gas supersaturation.

Monitoring of gas supersaturation should probably be instituted for the history of the project and not just until the cone values operate satisfactorily.

13, 2 If significant amounts of data have already been collected why is one full season of continuous pre-project monitoring needed? Why not just fill in the gaps?

13, 3 This paragraph answers the questions posed about the preceding paragraph. The information about the use of pre-project data should be disclosed in paragraph 2.

Relationships that will be better defined are those:

We suppose that continuous recordings would include a wide range of discharges.

Table 1

Dissolved gas monitoring may have to be done more than one season if a full range of pre-project flows are to be experienced.

Resident species have been omitted. See comment 6, 2.

General Comment on Gas Saturation

The current exceeding of water standards by total dissolved gas (TDG) suggests that a long term record may be desirable for legal reasons.

15, 3 Water temperature in the spring are expected to be
below...

16, 2 It would be helpful if river miles were reported with the
mentioned sloughs so the reader can form a mental image as
to how far apart the ice front will be on warm and cold
years.

There is not enough data on food habits and on the impacts of temperature changes of food sources to say this impact is anything but potential. Metabolism and food requirements will be elevated with increased water temperature. If the food supply is not adequate, starvation and susceptibility to disease could result. Also, fish growth will be affected all year round.

Reducing growth of juvenile fish in the open water season.

Altering the overwintering and incubation habitat conditions... This could also lengthen incubation time and delay the emergence.

Overtopping of upstream berms is not supposed to happen if they are raised.

Other potential impacts which should be listed are: 1) warmer water in the fall could alter the migration patterns of overwintering juvenile salmon; and 2) temperature changes could stimulate and affect outmigration timing of juvenile salmon so they would reach Cook Inlet at an unfavorable time from the standpoint of food availability.

- 17, 3 Other stations should include the key slough and side channel sites.
- 19, 1 There is no comparative data on the present overwintering mortality for "young salmon". There is only egg to outmigrant data on the survival of 0+ chum and sockeye salmon. The 1984-85 winter program should help define overwintering mortality.
- 19, 2 A statement on the refinement of operating procedures such as this should be included for all subjects discussed.
-
- 19, 3 The peak turbidity units may be too high. It would be better to report the weekly or monthly averages and ranges.
- 20, 2 To detect changes in a fishery resource, or fisheries resources as stated here, would require that that particular resource be monitored. It is stated that not all the important resources are being considered in this plan. Is it being assumed that if the conditions for a few are monitored the others will be covered as well?
- 20, 4 The comment for 20, 2 applies to this objective as well.
- 21, 1 What is meant by a "fairly" extensive coverage?

21, 3 Will weekly sampling provide an adequate representation of natural turbidity conditions? Present data suggests wide variation can occur over a single week. We recommend daily sampling at the Curry or Talkeetna fish migrant study sites.

Whose standard methods? There are several in use.

How do you plan to analyze suspended sediment versus turbidity data?

22, 3 If turbidity can not be controlled, are there any mitigation options planned?

23, 1 It is not true that only Hg "bioaccumulates" to dangerous levels in aquatic organism. There are several papers written on the effects of heavy metal leechates from mine tailings that will refute this statement.

The word "bioaccumulate" can not be found in any English language dictionary that we are aware of. Perhaps using "concentrates" would be better.

23, 2 Would not, in many cases, chelation tend to inhibit the toxicity of heavy metals?

23, 3 How will fewer fish in the impoundment minimize Hg "bioaccumulation" in those affected? It seems that the effects will just be less noticeable because of "limited fish populations".

24, 3 It is not true that Zn will not concentrate to dangerous levels within aquatic organisms. Much work has been done in Idaho and Montana on the effects of Zn, Cu, Cd and Hg as principal heavy metals in aquatic systems. E. Woody Trihey should be aware of much of the work done on the Couer d'alene River drainage in Idaho by Washington State University and the University of Idaho in the early 1970's.

25, 2 Technically there is no "tundra" in the impoundment area. Muskeg perhaps, but not tundra by definition.

25, 3 Restructure the last sentence to read "These areas will be samples for both natural (pre-project is preferred) and with-project conditions."

25, 4 Wouldn't it be better to select one or two target species ubiquitous to both areas? For example burbot and Arctic grayling.

26, 4 How many fish are needed each year for the study?

26, 6 Do the author(s) mean inorganic nitrogen and phosphorus?

27, 3 The project may potentially affect discharge from middle river sloughs? Seems it will for certain especially if berms are made at their heads.

28, 2 A major shortcoming of this plan is the lack of a resident fish program. See our FY 86 plan of study for our proposal. The numbers of rainbow trout, Arctic grayling, Dolly Varden and other resident species will likely increase with the project. Burbot, currently more

a subsistence species than a sport species, will likely be reduced in numbers.

Does the incidental catch of sportfish referred to mean those taken by the fishwheels? Very little pertinent information on trends in population size and composition can be ascertained from this method because of low catches and seasonal movements. Fishwheels are ineffective when sampling resident species with the possible exception of humpback whitefish. Fishwheels are deployed after the immigration (May) and removed before the outmigration (September/October).

29, 2 In 1983, only sockeye and chum were tagged with coded wire tags by ADF&G. Delete the extra wording of sloughs in this sentence.

RE: the last sentence. We don't have population and survival parameters for juvenile chinook, coho or pink salmon. Only indices of distribution and relative abundance. Are estimates of population and survival for these species going to be part of the program?

29, 3 A monitoring effort on the Talkeetna River should be considered as a control.

30, 1 Mentions of juvenile fish in the adult subobjectives seems inappropriate and should perhaps be in the juvenile section.

30, 2 This depends on the accurate and complete operation of the Adult Anadromous program because all survival estimates are based on this data. The cold branding program on chinook and coho may provide some data but if we are going to be expected to provide data on all five species, we had better initiate a program with open water this spring.

30, 3 Monitor long-term trends in the numbers and the timing of emergence...

Will there be a program to provide this data over the long term?

Sunshine, in addition to Curry, is needed to monitor the adult escapement.

31, 2 A permanent monitoring station should be developed on the Talkeetna River to provide baseline data for comparison to post-project conditions on the Susitna River.

31, 3 Only scale samples need be collected to determine age, weights are not necessary for age determination.

31, 4 We do not have the correct type of sonar (Biosonics) to place near fishwheels at Curry and still expect to accurately differentiate between adults destined for the middle reach and those engaged in milling activity.

Sonar may replace the need for mark/recapture efforts but until sonar can differentiate species, age, sex and size, fishwheels will be a necessary component.

31, 5 Length, age and sex sampling is done at the fishwheels and not on the spawning grounds. Tag numbers, except for "observation life" tags, can not be reliably observed during surveys of live salmon . Other tag numbers can be recorded from carcasses only.

32, 2 Smolt traps are better termed outmigrant traps.

32, 4 Again, a control station on the Talkeetna River needs consideration.

33, 2 Don't forget that juveniles need to get in and out
(resident fish also) before the adults return.

33, 5 Delete to measure run size from the first sentence. Also change sentence tense.

What are "natural" levels of production?

The last sentence is nonsensical and should be reworded.

AH

MEMORANDUM

State of Alaska *47*

RECEIVED

02-85-13.07

TO: Distribution

DATE: June 18, 1985

JUN 27 1985

FILE NO:

Alaska Dept. of Fish & Game
Susitna Hydro Aquatic Studies

TELEPHONE NO: 465-4100

ESTES

FROM: Don W. Collinsworth *DWC*
Commissioner
Department of Fish and Game

SUBJECT: Reorganization of
the Susitna Aquatic
Studies

The enclosed administrative reorganization plan for the Susitna Aquatic Studies Program takes effect July 1, 1985. This reorganization is necessary at this time to ensure continuity in the administration of the Susitna Aquatic Studies Program for this coming open water field season.

Effective July 1, 1985, the Susitna Aquatic Studies Program will be administered by Region II of the Division of Commercial Fisheries, with the Susitna Aquatic Studies coordinator position being directly supervised by the regional supervisor of that region. The coordinator will be responsible, under the direction of the regional supervisor, for planning and coordinating all departmental salmon escapement activities on the Susitna River, in addition to administering the RSA between the Alaska Power Authority (APA) and the Division of Commercial Fisheries for FY 86. The coordinator will also summarize all of the salmon escapement data collected to date in the Susitna River by the combined efforts of the Divisions of Sport Fish and Commercial Fisheries into one departmental technical data report. In addition, the coordinator will chair a committee of regional Sport Fish and Commercial Fisheries staff to ensure proper planning of future Susitna River escapement studies.

To accomplish these tasks, the coordinator FB IV position will be transferred to Region II of the Division of Commercial Fisheries.

All of the remaining Susitna Aquatic Studies Program permanent PCNs, with the exception of one Biometrician I/II position, will remain in the division they are currently assigned to through the duration of FY 86. Any lay-offs that may occur during FY 86 in the Susitna Aquatic Studies Program will follow DOA guidelines with the PCNs remaining within their currently assigned division. As such, the reorganization effects only the general administration of the Susitna Aquatic Studies Program, not the divisional status of PCNs. Any loaned PCNs will be returned to their respective source when they are vacated. PCNs that were

created with the provision that they were solely for the Susitna Aquatic Studies Program will not be transferred from the program. All vacated positions will be either returned, if borrowed, or remain vacant, unless the position is required to be filled to meet specific contractual obligations under the FY 86 agreement with the APA.

The Susitna Aquatic Studies biometrics staff will remain under the supervision of the Division of Sport Fish State-wide Biometrician III, with the exception of the one Biometrician I/II position, which will be transferred to Region II of the Division of Commercial Fisheries.

All Susitna regulatory activities proposed for FY 86 will be implemented under separate contractual agreements between the APA and the Division of Sport Fish, for funding a regulatory support team, and the Habitat Division, for funding that division's permitting and project review staff. The Division of Sport Fish will make its technical expertise in instream flow analysis available to the Habitat Division for the review of the various regulatory aspects of the Susitna project. The Habitat Division will use this information for coordinating the development of departmental policy positions and in representing the department's position on the Susitna project. The four individuals within the Sport Fish Division who are covered by that division's RSA with the APA will be required to work out of the Anchorage Raspberry Road office in order to ensure physical separation between that division's participation in the regulatory activities of the department and the other contractual requirements of the Susitna Aquatic Studies program.

The enclosed reorganization plan and supporting documents detail the rationale and organizational structure I am implementing by copy of this memorandum.

Enclosures

Distribution:

R. Logan	K. Parker
B. Baker	K. Florey
L. Pamplin	C. Yanagawa
S. Moberly	D. Daisy
M. Mills	R. Redick
S. Marshall	D. Watsjold
S. Eide	D. Schmidt
L. Bandirola	J. Wayman

cc: Denny Kelso
Steven Pennoyer

REORGANIZATION PLAN FOR SU HYDRO AQUATIC STUDIES PROGRAM
ALASKA DEPARTMENT OF FISH AND GAME

1. Introduction

Historical Organization and Objectives

The Alaska Department of Fish and Game (ADF&G) Su Hydro Aquatic Studies Team was organized in 1980. The team was established to ensure that the ADF&G would have an adequate and legitimate data base from which it could fulfill its statutory responsibilities to provide a timely evaluation of the potential impacts of the development of the hydro-electric facilities at Watana and Devil Canyon.

The ADF&G Susitna Hydro Aquatic Studies program was initiated with a five year study plan developed in October, 1979. The general goal of the program under this five year plan has been to collect and analyze baseline fishery and aquatic habitat information on the pre-project fishery resources of the Susitna River basin with the intent of continuing the study program in the event of project construction. Six objectives were initially outlined in the 1979 five year plan. These were to:

1. Determine the relative abundance and distribution of adult anadromous fish populations within the drainage.
2. Determine the distribution and abundance of selected resident and juvenile anadromous fish populations.
3. Determine the aquatic habitat and instream flow seasonal requirements of anadromous and resident fish species during each stage of their life histories.
4. Determine the economic, recreational, social, and aesthetic values of the existing resident and anadromous fish stocks and habitat.
5. Determine the impact the Devil Canyon project will have on the aquatic ecosystems and any required mitigation prior to a construction approval decision.
6. Determine a long-term plan of study, if the project is authorized, to monitor the impacts during and after project completion.

Information pertaining to the first three objectives has been supplied to the Alaska Power Authority (APA) at the end of each fiscal year in the form of basic data reports summarizing the pre-project conditions of fishery resources and their response to flow variations in the Susitna River basin.

The data and conclusions in these ADF&G reports are being used by the APA and its sub-contractors to assess potential post-project impacts on the fish resources of the Susitna River and their aquatic habitats.

To meet the first three objectives, the ADF&G/Susitna Hydro Aquatic Studies Program was initially divided into three principal study units, each assessing what was viewed as essentially unique aspects of the fisheries and associated habitat resources of the Susitna River basin. These three study units were the Adult Anadromous Fish Studies (AA) program, the Resident and Juvenile Anadromous Studies (RJ) program, and the Aquatic Habitat and Instream Flow Studies (AH) program. Two additional support units were also created, the Data Processing (DP) Unit and the Administrative Support Unit. Another study unit, the Secondary Task Coordination Support Unit, was later added to the overall study program to meet increased data interpretation demands of the APA and to review and edit other draft reports prepared by the various APA Su Hydro private contractors.

Future Needs and New Objectives

The 1980-84 studies primarily addressed the data collection and pre-project condition analyses which will be required by the department to provide a basis for assessing impacts of the proposed hydroelectric development on fisheries and habitat resources. With the completion of the upcoming year (FY 86), approximately five years of data on the fishery resources and a large number of studies on the habitat requirements of all species and important life phases will have been obtained. This collection effort and subsequent analysis reflects nearly \$15 million dollars in expenditures.

With the completion of objectives 1-3 and 4* above, the remaining two objectives (5 and 6) remain to be implemented by the ADF&G to enable it to meet its statutory requirements and enable the APA to complete the Federal Energy Regulatory Commission (FERC) licensing process. Objectives 5 and 6 include the completion of the quantification of impacts of the proposed hydroelectric project, the development of a departmental mitigation strategy that addresses the impacts, and provide a monitoring program or enforcement structure to all of the ADF&G to ensure the mitigation plan is implemented and effective.

Specifically, the following activities will be required to meet Objectives 5 and 6:

1. Completion of ongoing spring 1985 field studies that are of a short-term nature (and associated reports).
2. Continue monitoring efforts to provide a long-term reference to assess actual project impacts and mitigation success. Implement any additional monitoring required to address site-specific mitigation efforts.

*Objective 4 is currently being addressed by Harza Ebasco and its subcontractors.

3. Provide analytical summaries of the previously established data base that can be used by resource group policy makers in the regulatory process and that can be used by Alaska Power Authority (APA) and its contractors in mitigation planning.
4. Provide critical review of documents prepared by the APA, FERC and their consultants through the Habitat Division to ensure departmental policies are being implemented in the proposed development.
5. Develop a departmental policy through the Habitat Division concerning the desired type of mitigation activities to be recommended for implementation to the APA.

Problems with Current Organization in Meeting Future Needs

The current organizational structure of the Susitna Aquatic Hydro Studies within the ADF&G and the contractual agreement with the APA are primarily designed to provide field data collection and analysis of data only as it pertains to pre-project conditions. Unfortunately, direct transmittal of this information, and its interpretation, to the Habitat Division is not permitted under the existing structure and contractual agreement. Accordingly, the major requirements in the future are insuring that the data collected by the ADF&G and other consultants to the APA, and the existing pre-project analyses of these data, are integrated into the ADF&G project review process and that these data are properly interpreted for use by the ADF&G.

The only source of expertise presently available to the department in the area of instream flow assessment and in understanding of the fishery resources of the Susitna River in the vicinity of the project is within the present ADF&G Susitna Aquatic Studies Team. Yet, there is a ban against the communication and interchange of data and interpretation of these data between the ADF&G Habitat Division and ADF&G Susitna Aquatic Studies Team within the department. It is, therefore, highly probable that the interpretation of data by the ADF&G Susitna Aquatic Studies Team will disagree with the interpretation of information by the Habitat Division of the department.

As the Susitna project becomes more visible during the FERC hearing process, the public could easily be exposed to two departmental positions because of the separation of the ADF&G Susitna Aquatic Studies Team from the remainder of the department. This problem could also occur in other management functions of the department with differences in interpretation of the population data that may affect public understanding of management decisions.

In the development of mitigation plans with the FERC and negotiations of an instream flow, it is essential that interpretation of the fisheries resource data from Susitna Aquatic Studies Team be consistent and completed in a timely manner.

Therefore, the reorganization plan discussed below would integrate the expertise within the ADF&G Susitna Aquatic Studies Team into the department and resolve these deficiencies.

The proposed reorganization also ensures that the analytical capabilities that the APA requires to interpret Susitna Aquatic Studies and related fishery and habitat data, remain available through the settlement process and FERC licensing hearings.

Part of the proposed reorganization duplicates the administrative structure which has been used by the ADF&G, Division of Game, Susitna Aquatic Terrestrial Study Team since 1980.

In summary, a reorganization of the Susitna Aquatic Study Team is necessary to ensure that the investment the State of Alaska has made in an intensive Susitna River data collection effort be fully utilized in the hydroelectric project decision making process. This can only be accomplished by properly incorporating the data base collected by the ADF&G Susitna Aquatic Studies Team into the ADF&G regulatory process. This reorganization is based on the premise that it is desirable to both the ADF&G and the APA that the department have one evaluation of the collected data base.

II. Proposed Reorganization

The following reorganization plan resolves most of the problems discussed above. The current administrative structure of the ADF&G Susitna Aquatic Studies Team is depicted in the flow diagram in Attachment A. The reorganization plan is depicted in Attachment B. Information flow within the department and to and from the APA is illustrated in Attachment C.

The reorganization both redistributes and divides the existing Aquatic Habitat and Instream Flow (AH), Adult Anadromous (AA), and Resident and Juvenile Anadromous (RJ) projects and the administration and data processing into components:

- 1) a field monitoring program, including completion of short term studies, and
- 2) an analytical and technical support program.
- 3) a technical instream flow evaluation program in support of departmental regulatory functions.

The current Susitna Aquatic Studies Program Coordinator position (FB IV) will supervise the first two program components. Sufficient administrative staff will provide personnel and administrative support to these programs. These two programs would be administered under the Division of Commercial Fisheries, Region II Supervisor with indirect supervision by the Division of Sport Fish, Region II Supervisor.

The field monitoring program of component one will complete ongoing field tasks started in FY 85, complete short-term studies and monitoring activities, and initiate a long-term monitoring program. The long-term and short-term monitoring programs of component one will be administered by two Sport Fish FB III level project leaders. Both programs within the first component will be assisted by eight of the FB II's currently within the existing three AH, RJ, and AA projects. General analytical support for these activities will be provided by the second program component.

The second program component is designed to ensure proper interpretation of the existing data base. A group of the FB II level biologists from the three field programs and data processing support staff form this second component. This group will be headed by a Biometrician II and will incorporate three FB II biologists. Assuming there are no layoffs in the Sport Fish Division, this group will represent a portion of the individuals with the most writing and analytical experience necessary for incorporating all facets of the existing ADF&G Susitna Aquatic Studies Team in their work. Also included in this group are various clerical and report preparation support staff positions. Overall instream flow technical oversight and support of this program component will be provided by the Division of Sport Fish Biometrician III and supporting staff.

This second program component will provide data summaries of fish population data and reports and instream flow data that will be usable by regional policy makers and APA consultants. Finally, they will assist in providing the general analytical assistance and data base management to the first program component.

A third program component will be developed completely separate from the first two, under direct supervision of the Statewide Biometrician III, Sport Fish. This component will consist of a Sport Fish FB III coordinator and two Sport Fish FB II's. The third program component provides detailed review and analysis of APA documents pertaining to instream flow and aquatic habitat studies.

To ensure a common departmental policy position, all documents developed by the third program component and comments from other fisheries reviewers will be assembled by the FB III coordinator of this third program component group and be circulated for review to the Region II Fisheries Division designees. After input from the other divisions, the Habitat Division will be responsible for formulating a coordinated department policy position to be transmitted to the APA. In summary, this proposed reorganization of the existing ADF&G Susitna Aquatic Studies Team program will provide a consistency between the fisheries program and the current relationship of the Division of Game, Susitna River program with the Region II Division of Game and Habitat; thus, allowing the department to meet its statutory mandates.

Description of Change in Administrative Structure

The following is a summary of permanent personnel distribution in the proposed restructuring. The specific assignments of FB II's may change when a final program is developed. No layoff situation for FB II's is anticipated

until the spring of 1986. Sport Fish and Commercial Fish pcn's are designated as such, but may be reclassified or reassigned in the final plan. Although personnel availability, future plans, and individual skills are considered in this reorganization, individuals are not specifically assigned to any of the positions outlined.

PERSONNEL

(Permanent Staff Only)

Administration--(Program Coordination)

SF FB IV* - Program Coordinator

Support Services

SF Administrative Assistant I
SF Clerk Typist II (temporary)
SF Accounting Clerk II
SF Clerk Typist III

I. Field Monitoring and Studies Group (Component One)

Short Term Studies (No Further Studies Planned Beyond FY 86)

Coordination and subproject supervision

1 SF FB III (temporary) Group Leader and Coordinator
2 SF FB II
1 CF FB II

*This position will be transferred to the Division of Commercial Fisheries and will be directed by the Division of Commercial Fisheries Region II Regional Supervisor.

Long Term Studies .

Coordination and subproject supervision

- 1 SF FB III Group Leader and Coordination
- 2 CF FB II's
- 3 SF FB II's

Support Services for Long and Short Term Studies

- 1 SF Maintenance Mechanic (WG II)
- 1 SF Maintenance Mechanic (NPP)

II. Analytical Study Group (Component Two)

- 1 SF Biometrician II Group Leader*
- 3 SF FB II's

Data Processing Support Staff**

- 1 SF Biometrician II (part time)
- 2 SF Analyst/Programmer III
- 1 SF Data Processing Clerk II

III. Susitna River Instream Flow Evaluation Regulatory Support Team
(Component Three)**

- 1 SF FB III Group Leader and Coordinator
- 2 SF FB II's
- 1 SF Clerk/Typist II

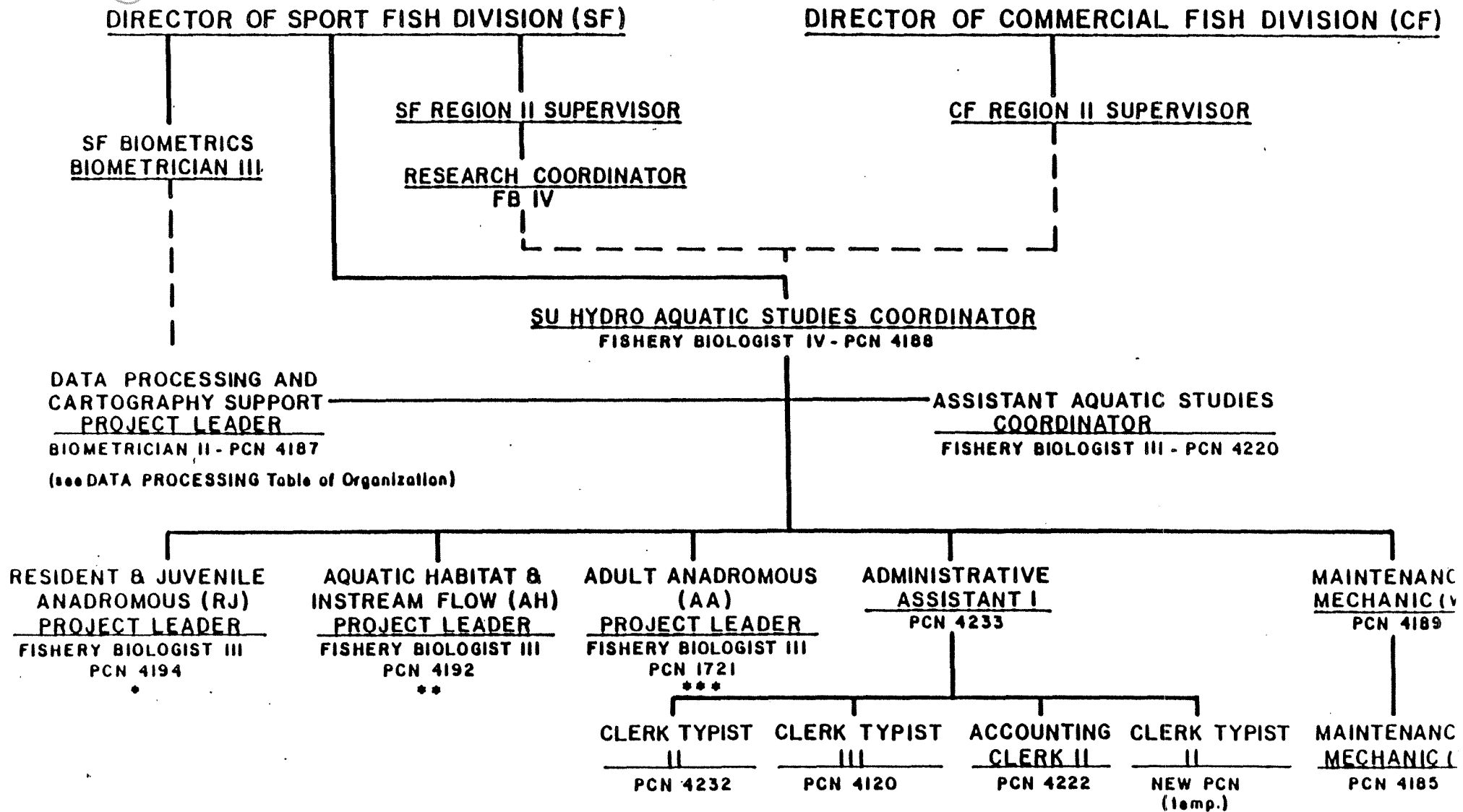
* To be transferred to the Division of Commercial Fisheries

** Technical administration to be provided by the Sport Fish Division
Biometrician III.

III. Time Schedule for Reorganization

Components One and Two are scheduled for implementation on July 1, 1985 and Component Three by July 1, 1985. Deliverables for each group and a due date will be established in the RSA with the Alaska Power Authority. This will also include a distribution of seasonal personnel. It is anticipated that the analytical and evaluation group be funded from APA RSA funds during FY 86 and will continue past that time if required by the ongoing regulatory process. The short term monitoring studies and continuation studies will not be extended beyond FY 86 unless mutually agreed upon by APA and ADF&G. The long term monitoring studies will be continued throughout the development of the project.

ATTACHMENT A
EXISTING ADF&G SU HYDRO TABLES OF ORGANIZATION

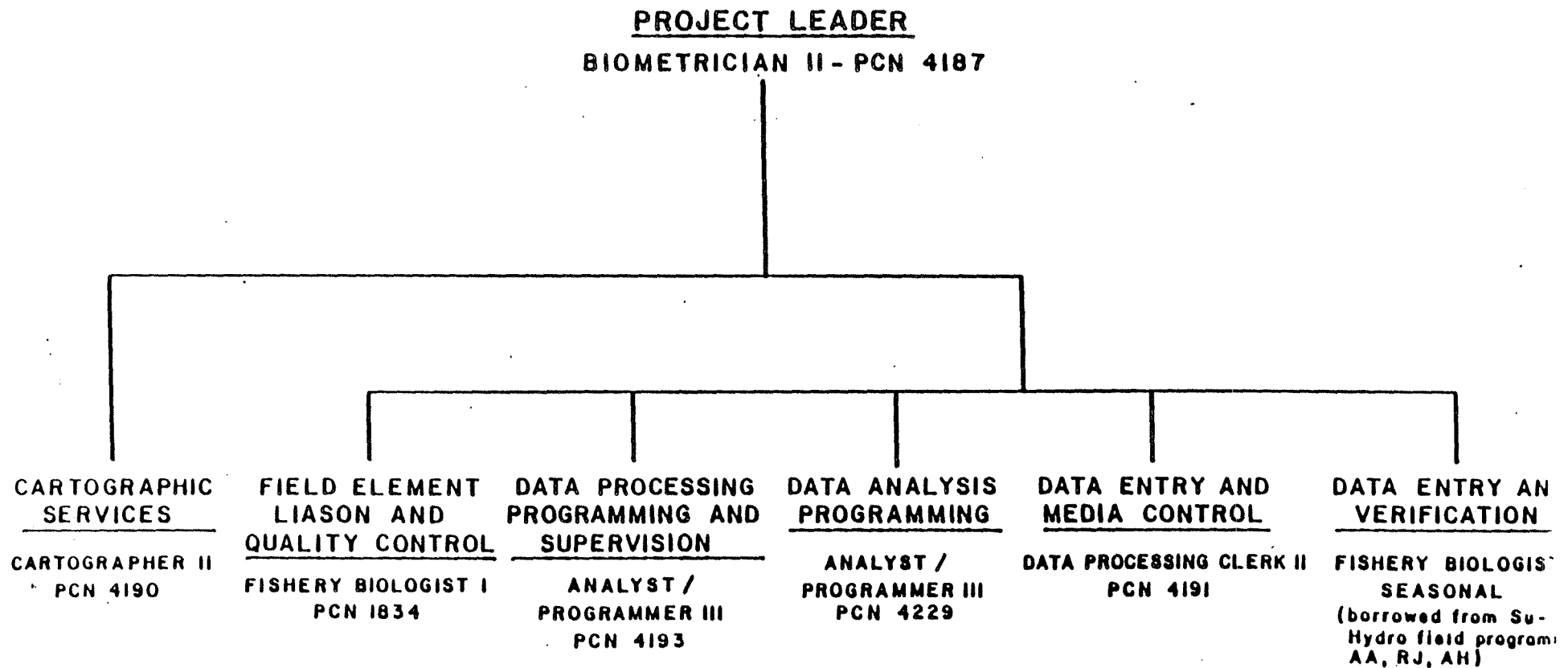


— — — INDIRECT SUPERVISION

- SEE RJ TABLE OF ORGANIZATION
- ** SEE AH TABLE OF ORGANIZATION
- *** SEE AA TABLE OF ORGANIZATION

DATA PROCESSING SUPPORT UNIT
AND
CARTOGRAPHIC SERVICES

TABLE OF ORGANIZATION
FY 85



RESIDENT & JUVENILE ANADROMOUS

TABLE ORGANIZATION FY 85

PROJECT LEADER

FISHERY BIOLOGIST III - PCN 4194

SUBPROJECT SUPERVISION SECTION

STUDY DESIGN COORDINATOR
FISHERY BIOLOGIST II
PCN 4197

ASSISTANT PROJECT LEADER
FISHERY BIOLOGIST II
PCN 4204

DATA ANALYSIS COORDINATOR
FISHERY BIOLOGIST II
PCN 4198

MAINSTEM OUTMIGRANT STUDIES (TK - DC)

SUBPROJECT LEADER
FISHERY BIOLOGIST II
PCN 4200

TALKEETNA
(Outmigrant Traps)

CREW LEADER
FISH TECH II
PCN 1790

FISH TECH II
PCN 4238

FISH TECH III
PCN 4239

GOLD CREEK
(Coded Wire Tag)

(4) FISH TECH II
PCN 4240
4241
4242
4243

MAINSTEM OUTMIGRANT STUDIES (CI-TK)

SUBPROJECT LEADER
FISHERY BIOLOGIST II
PCN 4206

FLATHORN
(Outmigrant Traps)

CREW LEADER
FISH. BIO. I
PCN 4202

(2) FISH TECH II
PCN 4236
4237

TRIBUTARY OUTMIGRANT & MAINSTEM REARING (TK - DC)

SUBPROJECT LEADER
FISHERY BIOLOGIST II
PCN 4205

INDIAN RIVER
(Cold Branding)

FISH. BIO. I
PCN 4212

LOWER RIVER RESIDENT & JUVENILE FISH STUDIES (CI - TK)

SUBPROJECT LEADER
FISHERY BIOLOGIST II
PCN 4201

DESHKA
(JAHS)

CREW LEADER
FISH. BIO. I
PCN 4215

FISH. BIO. I
PCN 4216

SUNSHINE
(JAHS)

CREW LEADER
FISH. BIO. I
PCN 4203

FISH. BIO. I
PCN 4199

TALKEETNA
(JAHS/RES)

FISH. BIO. I
PCN 1769

TALKEETNA
(Radio Telemetry)

FISH. BIO. I
PCN 1769

GOLD
(Cold B)

CREW
FISH.
PCN

(3) FISH
PCN

WINTER STUDIES OF RESIDENT & JUVENILE ANADROMOUS FISH

RESIDENT FISH
(CI - DC)

SUBPROJECT LEADER
FISHERY BIOLOGIST II
PCN 4201

JUVE
ANADRO
FISH (

SUBPROJEC
FISHERY BI
PCN 4

DC = DEVIL CANYON
TK = TALKEETNA
CI = COLD BRAND

AQUATIC HABITAT AND INSTREAM FLOW STUDIES

TABLE OF ORGANIZATION FY 85

PROJECT LEADER

FISHERY BIOLOGIST III - PCN 4192

ASSISTANT PROJECT LEADER

FISHERY BIOLOGIST II - PCN 4211

SUBPROJECT LEADER

FISHERY BIOLOGIST II - PCN 4207 *

SUBPROJECT LEADER

FISHERY BIOLOGIST II - PCN 4196

SUBPROJECT LEADER

FISHERY BIOLOGIST II - PCN 4195

SUBPROJECT LEA

FISHERY BIOLOGIST II -

FOOD AVAILABILITY STUDY

(2) FISH. BIO. I
PCN 4180
4101

PASSAGE VALIDATION

(2) FISH. BIO. I
PCN 4149
1766 (borrowed)

INCUBATION REPORT

FISH. BIO. II
PCN 4230

PHYSICAL DATA COLLECTION

(6) FISH. BIO. I
PCN 4126
4213
4217
4214
4116
4234
(2) FISH TECH II
PCN 1536 (borrowed)
1370 (borrowed)

MIDDLE RIVER MODELLING

(5) FISH. BIO. I
PCN 4209
4210
4181
4186
1369 (borrowed)
FISH TECH II
PCN K558A (temp.)

LOWER RIVER MODELLING

(2) FISH. BIO. I
PCN 4202
4231
FISH TECH III
PCN 1675 (borrowed)

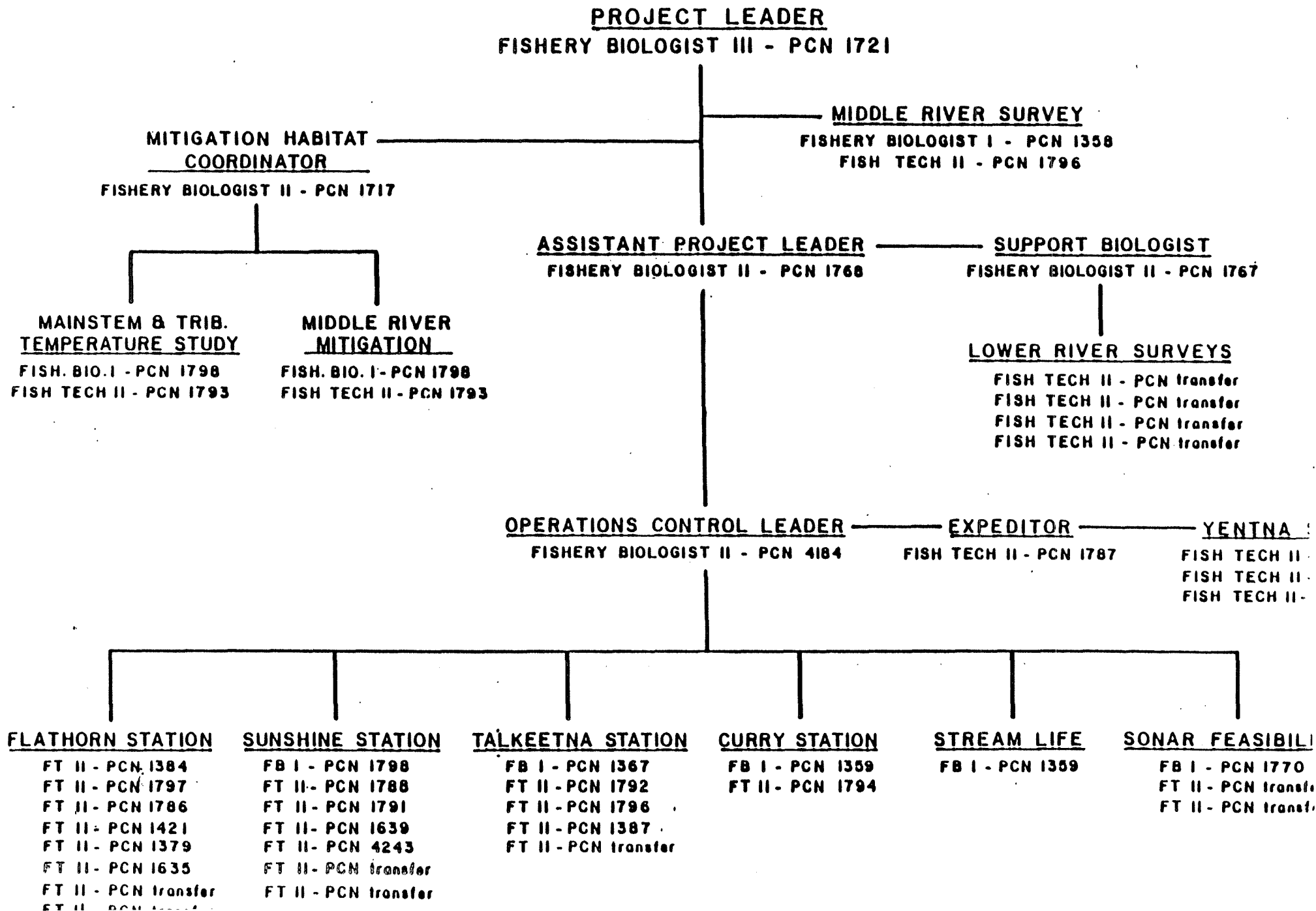
PROJECT SUPPORT

(2) FISH. BIO. I
PCN 4244
4245

* PCN 4207 ALSO SERVES AS THE ALASKA POWER AUTHORITY SUP
TASK LIASON & IS SUPPORTED BY PCN 4230.

ADULT ANADROMOUS

TABLE OF ORGANIZATION FY 85



ATTACHMENT B
PROPOSED TABLES OF ORGANIZATION FOR REORGANIZING
THE ADF&G SU HYDRO TEAM

PROPOSED REORGANIZATION PLAN

FY 86

— DIRECT SUPERVISION
 - - - INDIRECT SUPERVISION

Commercial Fish

Sport Fish

COMMERCIAL FISH DIVISION

SPORT FISH DIVISION

REGION II REGIONAL SUPERVISOR

(MONITORING & TASK COMPLETION STUDY TEAM, SUSITNA RIVER STUDIES)

SUSITNA RIVER
AQUATIC STUDIES
PROGRAM COORDINATOR
FB IV

ADMIN. ASST. I

CLERK TYPIST III ACCT. CLERK II CLERK TYPIST II (TEMP.)

FB III (TEMP.)
(SHORT TERM STUDIES)(3) FB II
COORDINATION
& SUPERVISIONFB III
(LONG TERM STUDIES)(5) FB II
COORDINATION
& SUPERVISIONMAINT. MECH. (WG II)
MAINT. MECH. (NMP)BIOMETRICIAN II
(ANALYTICAL STUDY TEAM,
SUSITNA RIVER STUDIES)

(3) FB II

TASKS

Provide species-based data summaries for the historical Susitna data base.

Provide habitat-based data summaries for the historical Susitna data base.

Provide general data processing services for the Commercial Fish Susitna River Studies Program.

BIOMETRICIAN I/II
(1/2 TIME)(2) ANALYST PROGRAMMER III
DATA PROCESSING CLERK II
CARTOGRAPHER IIFB III
(SUSITNA RIVER INST.)
FLOW EVALUATION
REGULATORY SUPPORT

CL

(2) FB II

TASKS

Review Susitna instream flow and documents for the regional Habitat providing, if desired, additional supporting the reviews.

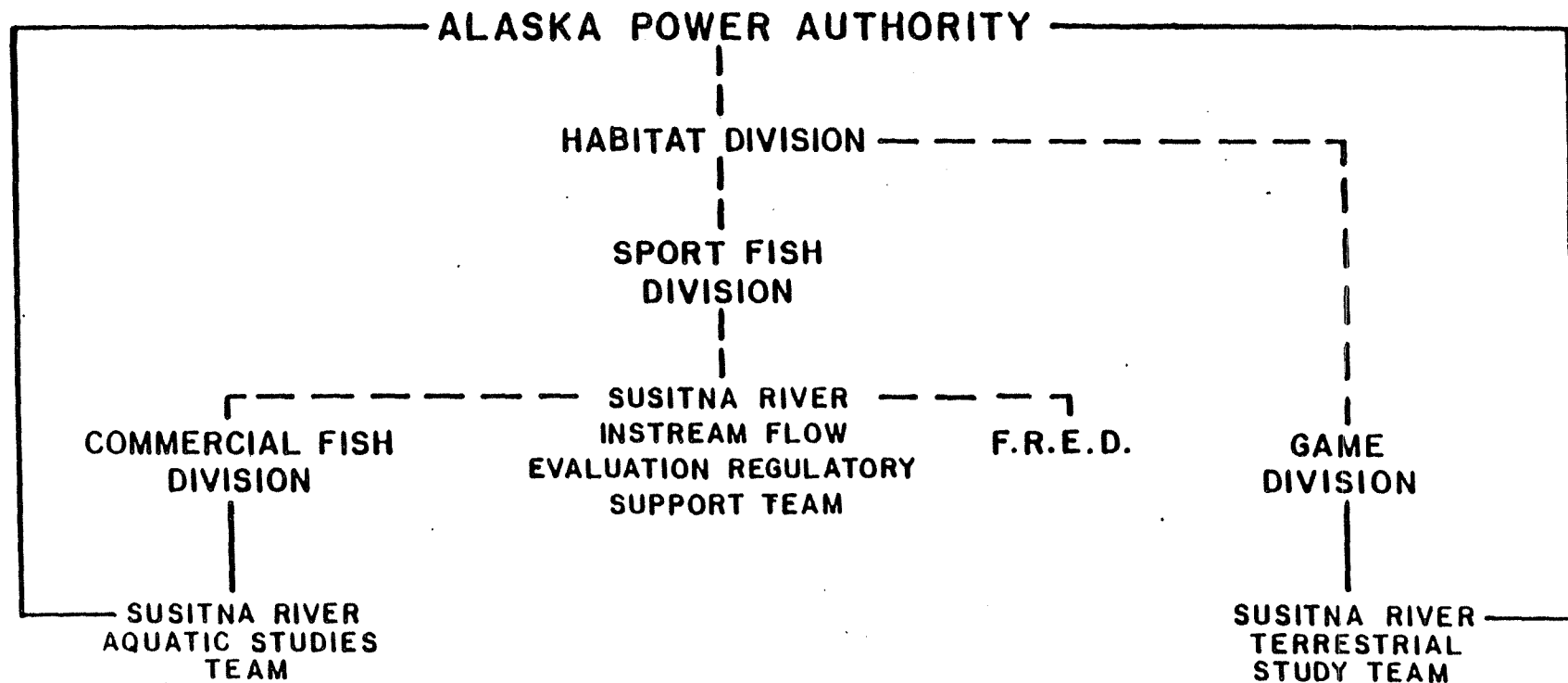
Prepare draft policy documents on planning for the Susitna Project / to the Division in its coordination of departmental policy positions.

*To be transferred to Commercial Fisheries.

ATTACHMENT C
ADF&G DIVISIONAL INFORMATION FLOW

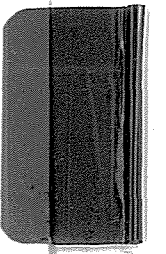
**SUSITNA RIVER STUDIES
REGULATORY & TECHNICAL DATA
INFORMATION FLOW**

FY 86



3/19/85
11:00 a.m.

———— DATA COLLECTION OR SUMMARIZATION
- - - - REGULATORY RESPONSE



ESTES ✓

STATE OF ALASKA
DEPARTMENT OF FISH & GAME

May 12, 1981

Mr. Jeff Weltzin
Fairbanks Environmental Center
218 Driveway
Fairbanks, Alaska 99701

The Department of Fish and Game has reviewed the "Susitna Hydroelectric Mid Report" to Governor Hammond and the Alaska Legislature, prepared by the Alaska Power Authority (APA) with special attention to the conclusions section starting on page 7-6 which you questioned in your March letter to me.

To be fair to the preparers of the Mid Report, we have looked at the total text of the Task 7 environmental studies, pages 7-1 through 7-9 of that report. The overall discussion of the environmental implications on fisheries (p. 7-1 to 7-2), Wildlife (p. 7-2 to 7-5), land use analysis (p. 7-5), cultural resources (p. 7-5), recreation planning (p. 7-5), and plant ecology (p. 7-6) presents a generally even-handed presentation of the issues. There are some points, however, which require clarification pertaining to our evaluation of the environmental section.

p. 7-1 para. 3

The Alaska Power Authority states:

"The 30 month feasibility study currently underway (identified as Phase I) will provide sufficient data for a license application to the Federal Energy Regulatory Commission (FERC). However, it will not provide all the data ultimately needed, because the study period is too short to observe a substantially complete life cycle of certain species. Also, Phase I develops only preliminary mitigation measures. Accordingly, Phase II is planned to run concurrent with the FERC license application processing. Phase II studies will continue field investigations initiated during Phase I and will fully develop mitigation plans. During the FERC license processing, results of these Phase II studies will be integrated into the original license application. The amplified application will then form the basis for license approval or disapproval by FERC. The investigations comprising the Phase I program include fisheries, wildlife, plant ecology, land use analysis, cultural resources, recreation planning and socio-economic analysis."

With respect to the above statements, I would like to reiterate a comment made to you by my office in a letter on March 19, 1981. This comment is as follows:

"The Department has some difference of opinion with the APA regarding total adequacy of the Phase I information which will be submitted to the Federal Energy Regulatory Commission (FERC) to initiate the license application process in 1982 (refer also to the ADF&G October 1979 Plan of Study). However, APA has indicated their commitment to the continuation of the aquatic studies into Phase II to continue answering these impact issues. In the end, the determination as to the adequacy of the data at the time of the preliminary license submission is essentially the FERC's to make. Our difference with the APA concerns the ability of their consultant group to evaluate the potential project impacts with basically one year's data on fisheries. FERC may, however, find that the data and preliminary evaluations given to that agency are sufficient to begin the licensing and EIS development process provided that the APA and the Acres American and TES consultant groups provide a strong qualification of unresolved issues, and a plan and budget for continuing aquatic studies to assess the substance of these issues before the final decision to approve or disapprove the project is made."

The commentary by APA in paragraph 3 of page 7-1 is basically consistent with our understanding of the Phase I and Phase II processes which they have portrayed to this Department and other state and federal resource agencies. I've restated my former comment to you to specifically point out our prior understanding of the commitment which APA has made to continuation of studies into Phase II, and which is explicitly outlined in the APA statements of the Mid Report. But, I reemphasize, that project feasibility from the environmental standpoint will not be determined in the opinion of this Department by April 1982.

I understand that some statements made in presentations to special interest groups by APA representatives have construed that the feasibility study process will terminate in April 1982, and that sufficient information will be available at that time to make a decision to construct the project. For example, in the Mid Report it is stated in the letter to Governor Hammond signed by the APA Board of Directors that, "While the Board is confident in making this recommendation to continue the feasibility studies, our conclusions regarding project feasibility will not be reached until April 1982." (Emphasis added)

This Department believes the above statement reflects a contradictory and misleading representation of the Phase I and Phase II processes. A consistent definition of the process to public, special interest groups, agencies, individuals, and project contractor's needs to be understood by everyone.

We believe that APA's representation to the ADF&G and Su Hydro Steering Committee on the Phase I/Phase II break is that it is 1) a milepost at which a license application to FERC will be made, and 2) a decision point for redirection and continuation of the studies, as necessary, to make final resolution of project feasibility and define mitigation alternatives. In the context presented to us by APA, the Phase II decision point is not to determine to initiate project construction, nor to end the feasibility studies as some of the statements seem to indicate.

May 12, 1981

Since judgement of impacts is a necessary and integral facet of determination of project feasibility, and since this Department does not believe that project impacts will be reasonably known by April 1982, I would agree that the Mid Report appears to be counter to past reports and positions of this Department regarding the Su Hydro Project and the assessment of impacts as you suggested in your March letter.

On P. 7-6, para. 6 sentences 1 and 2 the Mid Report states:

"It must be firmly stated that insufficient data exists as of the date of this report to definitively predict the overall impact of the Susitna Basin development. From that inability follows a corresponding inability to judge the acceptability or lack thereof of the probable impact.^{2/}

^{2/} These conclusions are based on discussions with members of the Acres study team (p. 7-9)."

The Department of Fish and Game agrees with these statements. Yet, the text following these sentences seems to depart into a series of statements based on conjecture and speculation. For example, line 5 continues:

"The Susitna project will result in a change in stream flow, but there is as much evidence to indicate that these alterations would create a positive overall fisheries impact as there is to suggest the opposite."

My staff indicates the question of positive impact potentials has often been posed to them by APA and Acres American staff in discussions of the research needed to determine project impacts. In responding, the ADF&G staff has indicated that such potentials do exist provided the flows, water quality, spawning substrates and rearing areas below the project meet the specific requirements of the fish species present such as chinook salmon. However, it has been pointed out as well, that the water quality studies downstream of the project, and in the impoundment itself, may not be adequately examining information on this aspect of the physical environment important to fish. If they are not, we will be unable to determine with reasonable scientific objectivity whether the impact of the project on fisheries will be positive or negative.

The remainder of the conclusions section cites certain impressions and interpretations. The Department hopes that the conjecture expressed:

"Whether positive or negative the overall change in the Cook Inlet salmon fishery will probably be slight," *proves true.* ↗

Unfortunately, it is too early, based on current understanding of the distribution of anadromous stocks in the Susitna River and their contribution to the Cook Inlet fishery, to make this statement with any positive assurance.

Cumulative indirect impacts from a hydroelectric project may have a substantial affect on total fisheries production. Impacts on the fisheries populations of the important spawning tributaries may be very direct, if the juveniles rear for a significant portion of the year in the mainstem Susitna River. Preliminary data collected by the ADF&G Su Hydro Aquatic studies team from January 1981 to the present shows, for example, that

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juvenile chinook salmon are distributed in the mainstem, sloughs and side channels from the vicinity of Alexander Creek on the Susitna just above the mouth of the Susitna River on Cook Inlet to Portage Creek the last tributary on the mainstem just below the Devil Canyon site.

Studies by May (1981) and D'oust and Clark (1980) indicate that the potential for dissolved nitrogen entrainment may be influenced more by the design of a dam and the rate of spill rather than the number of dams which are built. Based upon a preliminary operational scheme of 400 MW, the Devils Canyon Dam mean spill for the months of August has been projected at 5,964 cfs (Acres 1981). We believe that this spill rate may have the potential for the formation of dissolved gas supersaturation below Devils Canyon, and could therefore negatively impact the fishery resource. It is our hope that studies of the potential for dissolved gas supersaturation will be conducted and dam and operational designs be evaluated for eliminating this potential impact.

We appreciate your interest, please keep this Department informed of concerns the Fairbanks Environmental Center has regarding the Su Hydro Project.

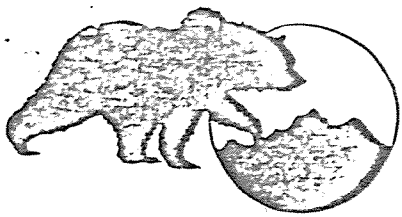
Sincerely,

Ronald O. Skog
Commissioner
(907) 465-4100

Sorry for the delayed response.

Enclosure

cc: E. Yould
R. Andrews
S. Pennoyer



Fairbanks Environmental Center

218 DRIVEWAY
FAIRBANKS, ALASKA 99701
(907) 452-5021

Dear Commissioner Shoop,

Per our discussion, enclosed is a copy of the APA's report concerning environmental assessment which will be submitted March 30, 1981 to the Governor and Legislature. As you will note, there are several strongly worded statements in the conclusion (pg. 7-6) that indicate impacts to the Cook Inlet fishery will be minor.

This statement is misleading and is clearly counter to ADF&G's past reports and position which state that your agency will not be able to assess impacts until several years of study. I feel these statements will be used by certain interests ~~and will~~ to disregard the importance of the Sustana fisheries and F&G studies.

In light of the Governor's statements on the Kupuk River, it seems that the Governor could be aware of the parallel impacts that might or might not occur on the Sustana

ENVIRONMENTAL IMPLICATIONS

SECTION VII

VII. ENVIRONMENTAL IMPLICATIONS

A substantial portion of the feasibility study is being directed to environmental considerations. Objectives are (1) to assess the probable environmental effects that would be caused by development of the Susitna Basin for hydroelectric purposes, and (2) to insure that any schemes devised for the hydroelectric development of the basin fully consider and integrate environmental considerations.

During the first year of the study, a comprehensive review of existing literature was made, and field studies were initiated. Existing data were used in the preliminary planning of the basin development. Findings derived from the continuing field investigations will be used to modify those initial development plans, leading by the end of the study to a sound project configuration and to identification of mitigative actions as needed.

The 30 month feasibility study currently underway (identified as Phase I) will provide sufficient data for a license application to the Federal Energy Regulatory Commission (FERC). However, it will not provide all the data ultimately needed, because the study period is too short to observe a substantially complete life cycle of certain species. Also, Phase I develops only preliminary mitigation measures. Accordingly, Phase II is planned to run concurrent with the FERC license application processing. Phase II studies will continue field investigations initiated during Phase I and will fully develop mitigation plans. During the FERC license processing, results of these Phase II studies will be integrated into the original license application. The amplified application will then form the basis for license approval or disapproval by FERC. The investigations comprising the Phase I program include fisheries, wildlife, plant ecology, land use analysis, cultural resources, recreation planning and socio-economic analysis.

The literature search provided a base line for predicting some probable effects of developing the Susitna Basin. That literature survey suggested that while there might be both gains and losses from the environmental viewpoint, none were of sufficiently major or irretrievable effect as to unequivocally rule out the project concept. New field data being collected are tending to reinforce the initial literature suggestions. Conclusions evolving from the first year of field investigations will not be available until April/May 1981. However, indications and tentative expectations are emerging. They are discussed below, together with expanded details of the various areas of investigation.^{1/}

FISHERIES

Although it is generally known that the Susitna River has heavy anadromous runs, relatively little is known about the contribution of the Susitna Basin to the total Cook Inlet fisheries; the capacity of the basin to rear fish, or the distribution of fish by species and season. The initial objective of the fisheries studies is, via field surveys, to answer these points. The principal field investigator (the Alaska Department of Fish and Game) is conducting an extensive program of sampling, mapping and

assessment to determine the relative abundance and distribution of adult anadromous fish populations within the Susitna drainage, determine the distribution and abundance of selected juvenile anadromous fish populations, and delineate the seasonal habitat requirements of the anadromous and the resident fish species during each stage of their life histories. A related outcome of the field investigations will be an assessment of the economic, recreational, social and aesthetic values of the existing resident and anadromous fish stocks and habitat. These investigations are directed at the entire basin, from the Tyone River confluence down into the Cook Inlet. Hydroelectric development of the Susitna River will change the nature of the river below the dam sites. The normal flow regime will change from the present flow pattern of high flows in the summer and very low flows in the winter to a more or less uniform discharge below Devil Canyon dam. Also, the sedimentation characteristics, temperature and chemical balance of the river might be affected. Extensive hydrologic investigations are presently underway to assess present river conditions and to predict conditions after development. These predictions will then be integrated with data from the fish studies to provide an impact assessment on fisheries.

Because of a late start of the ADF&G field investigations, few field data have been gathered to date. However, information from the literature search together with first year hydrologic data suggests several possible effects after development.

The upper Susitna River, whose flow would be regulated by the proposed dams, contributes about 40 percent of the total annual Susitna River flow passing the Parks Highway Bridge and approximately 17 percent of the total Susitna River flow entering Cook Inlet. Seasonal flow changes will be greatest immediately below the dam with increasing attenuation downstream towards Cook Inlet as tributaries augment the volume of the river. According to preliminary indications there are no anadromous fish above Devil Canyon because fast-moving rough water at that location poses a natural barrier to their migration. If true, the dams will not cut off any traditional spawning migration. However, changes in the character of the river below the dams may alter the habitat for survival of young salmon spawned in lower tributaries. These changes may be deleterious (or perhaps beneficial) to salmon fry. Additional hydrologic data are needed to better judge the changes in flow that may be anticipated.

It is suspected that resident fish species in the upper reaches of the Susitna are very limited. The creation of an extensive reservoir behind Devil Canyon dam suggests that resident fish populations might be developed through increasing existing species or introduction of new species. However, the annual draw down cycle of the Watana reservoir will be sufficiently great to preclude any meaningful resident population there. Much more work needs to be done before these points can be answered.

WILDLIFE

The wildlife studies are subdivided into a number of components and are discussed below. Extensive interrelation exists between the various wildlife studies and complimentary studies of plant ecology, recreation planning,

land use analysis, socio-economic analysis, access road location, and design development.

Wildlife investigations are being pursued by the Alaska Department of Fish and Game and the University of Alaska, Fairbanks. The primary objective is to define the types and extent of wildlife habitats in the study area, and the utilization of those habitats by wildlife. These data will serve to predict the probable effects on wildlife of river impoundments. They likewise will be a basis for planning mitigation measures.

Wildlife Studies: Caribou

First year investigations concentrated on estimation of numbers, composition of sub-herds, delineation of calving areas, determination of migratory routes, and timing of movements. Particular emphasis was placed on evaluating potential impacts of the proposed impoundments on movements and sub-herd isolation of the caribou. Study techniques used included radio collaring, aerial tracking, and photography.

The Nelchina caribou population is estimated to number about 17,000 animals, divided into several sub-herds. The bulk of the animals summer in the Talkeetna Mountains and foothills, with others occupying several localities on the north side of the Susitna River. During the rut in autumn most of the caribou congregate on the Lake Louise Flat. Winter concentrations in 1980 occurred from the Maclaren River east to the Chistochina River, and in the Slide-Mountain-Little Nelchina River area. These seasonal movements involve crossings of the Susitna River in the sector to be inundated by the Watana dam. The impoundments will be something of an impediment to migration, but because it is relatively narrow caribou can swim across it readily provided that the shorelines are not blocked by ice shelves, frozen mud banks, or floating timber. Crossings undertaken during spring break-up would appear to be the most troublesome. At that time the animals are in weakened condition and ice flows are treacherous.

Development of access roads, air fields, and transmission lines may prove disruptive to caribou movements and general welfare. Particular concern should be directed to minimizing disturbance of the animals on their traditional calving grounds in the Talkeetna Hills and Oshetna/Kosina hills, which lie just south and north of the Watana impoundment. Improved access by hunters would permit increased hunting of the caribou.

Distribution and movement studies and habitat selection studies will continue through Phase I with routine monitoring of radio-collared caribou.

Wildlife Studies: Moose

Major points of investigation concern numbers of moose, seasonal habitat uses, movement patterns, and supplies of forage on winter ranges. Approximately 2,000 moose were estimated to exist on the

upper Susitna basin. Forty of these were captured and fitted with radio collars and their movements monitored. Of 563 observations of marked animals, 6 to 9 percent occurred in areas scheduled to be inundated, largely by the Watana dam. More data are needed, especially in winter, to interpret adverse effects of inundation on riparian moose range. Calf production in this population is high, signifying adequate nutrition at present. Many calves are lost to predators, particularly brown bears.

In the lower Susitna valley 10 moose were collared and their movements traced. Some lived all year close to the river, while others migrated seasonally to adjoining uplands. Willow, cottonwood, rose, and highbrush cranberry were preferred browse foods. An important issue to be further studied is the possible effect on these forage species of changes in river discharge and channel meandering.

Wildlife Studies: Dall Sheep

An aerial survey of sheep ranges was conducted in July, 1980. Three discrete areas of occupied range were identified, namely, Watana Creek hills, Portage-Tsusena, and Mount Watana. All are close to the areas to be impounded, and disturbance may become a factor in sheep welfare. The current population is estimated to be near 300 animals. Aerial surveys will be repeated in 1981.

Wildlife Studies: Black and Brown Bears

Studies are being conducted to determine the distribution and abundance of black and brown bears in the vicinity of the proposed impoundment areas, seasonal ranges, including denning areas, and movement patterns of bears. In 1980, 27 black bears and 27 brown bears were captured and marked using helicopter darting techniques. Adults were radio-collared and their movements traced. Brown bears utilize the proposed impoundment areas in spring but spend summer and autumn at higher elevations; they also den at these upper sites. Black bears drop down in late autumn to select dens near the river at elevations that will be inundated. All summer they frequent the timbered slopes which will be close to the level of flooding. This species probably will be more severely affected by the hydro-development than the brown bear. However, both species are abundant at present and probably will still be present in goodly numbers after development.

Wildlife Studies: Wolf, Wolverine

Five wolf packs were identified in the study area and 23 wolves were captured and fitted with radio collars to trace movements. The average size of a pack's territory was 450 sq. mi. (212 to 821). The five packs constituted at least 40 animals in spring 1980. By fall, the packs had increased to 77 wolves. Moose were the principal prey (52%), with caribou second (38%). Each pack made a kill about every fourth day. The most important potential impact of the Susitna hydro-electric project on wolves would relate to reductions in numbers of prey.

Four wolverines were radio-collared and 86 radio locations were obtained in 1980. Home ranges were large, as would be suspected (100 to 150 sq. mi. for males, 33 sq. mi. for a female). Wolverines prey largely on rodents, hares, and an occasional caribou calf. They seem to be somewhat intolerant of human disturbance but probably would be little affected by hydrodevelopment.

LAND USE ANALYSIS

Land use analysis studies are being conducted by the University of Alaska, Fairbanks. Primary objectives are to evaluate past, present, and future land use trends, describe present and future resource management programs and identify the major changes in land use that could result from the hydroelectric development of the Susitna Basin. Investigative tools have included inventories, review of resource management planning done to date, and assessment of present land use legal constraints such as the recently passed D-2 bill.

Data to date indicates little resource management planning done or proposed for the Susitna area. A complicating factor is the heterogeneous mosaic of land management activities and objectives as a result of the fragmentation brought about through the ANCSA and state land selection events. One of the major concerns relates to access to the area that will result from a basin development. Increased access would bring more opportunity to use the land, leading to more pressure on existing resources. This could force a change in land use, the lifestyle of those who have used and are still using the area, and could alter the ecological system. No assessments are available yet as to the degree of severity of these changes.

CULTURAL RESOURCES

The objectives of this investigation are to identify archaeological, historical, and paleontological resources in the project area, to test and evaluate these resources, and to propose mitigation measures and lessen the impact of ground disturbing activities. The principal investigator is the University of Alaska Museum. Activities to date have included a literature search, substantial aerial photography, evaluation, and some archeological excavation.

A number of sites have been identified that contain finds from both historic and prehistoric times. While only limited assessment of the finds has been made, no unexpected data has emerged. If this trend continues, post-basin development impacts will not be extreme. However, this assessment could be substantially qualified by next year's investigations.

RECREATION PLANNING

In addition to assessing the recreational aspects as part of the wildlife, land use and socioeconomic feasibility study subtasks, the principal investigator (University of Alaska, Fairbanks) is coordinating

the preparation of a recreation plan for development of the total project lands and waters associated with the basin development. The objectives of this plan are to provide the most socially acceptable and desirable mix of public recreation opportunities in concert with conservation and preservation objectives.

Considerations include the degree of access generally desired, extrapolating therefrom the amount of utilization of project lands that would result, balancing that degree of utilization against the capability of the project lands to support it and to identify and incorporate unique natural features, recreational opportunities or other unusual characteristics. Techniques used include inventorying, crossfeeding from other feasibility study subtasks, consultation with management agencies at all governmental levels, and seeking public input on the various alternative recreation concepts.

To date, only broad concepts have been developed. Response to these broad scenarios suggest moderate to high development is desired. Substantial further input and refinement to the proposals is necessary before an optimized configuration can result.

PLANT ECOLOGY

The plant ecology studies, being principally investigated by the University of Alaska, Fairbanks, have as their objective the mapping and characterization of the vegetation/habitat types occurring in the project area. Desired results include identification of rare or endangered types, concentrations or conditions, and support to other investigations such as food source assessment for fauna. Principle investigative tools have been high altitude infra-red photography and landsat imagery.

To date, vegetation types and dispersal have been roughly categorized. Principle vegetation types in the area of inundation are closed mixed conifer and deciduous forest, closed and open conifer forest, tall shrubland and open and closed shrubland. Losses of vegetation/habitat in the area of proposed haul roads and borrow areas will probably consist largely of low shrubland and mat and cushion tundra. It appears that no biologically important types will be lost. Assessment of the impact of loss of habitat remains to be made.

CONCLUSIONS

It must be firmly stated that insufficient data exists as of the date of this report to definitively predict the overall impact of the Susitna Basin development. From that inability follows a corresponding inability to judge the acceptability or lack thereof of the probable impact.^{2/} The Susitna project will result in a change in stream flow, but there is as much evidence to indicate that these alterations would create a positive overall fisheries impact as there is to suggest the opposite. Whether positive or negative the overall change in the Cook Inlet salmon fishery will probably be slight. Although the Susitna

may be a major salmon producer for the Cook Inlet the major Susitna contributions are expected to come from tributaries such as the Yentna, Kashwitna, Willow, Deshka, etc. - none of which are affected directly by Susitna development. Some questions for which there is totally inadequate data to even speculate on impacts are - what is the importance of the mainstem Susitna for winter rearing and how important for spawning and rearing are the sloughs and side channels? These questions are being addressed in the Phase I studies. It may be worth noting that some of the aspects of other hydro projects which have created significant impacts on fisheries are not inherent to Susitna. For instance:

1. There is no direct blockage of fish migration or escapement resulting from the dam itself.
2. There are no significant river diversions resulting in subsequent low flows in the diverted river.
3. Regulation is being factored into design to eliminate significant daily fluctuations in flow.
4. Nitrogen entrainment will not be significantly increased because there are not numerous reservoirs in series.

The possibility may exist for enhancing the Susitna River salmon fishery by taking steps to remove the velocity barrier at Devil Canyon and thereby open the upper Susitna River to salmon access. It is not known at this time whether the existence of the Susitna Hydroelectric Project would be an assistance or an impediment to the realization of this concept.

There will, of course, be a reduction in wildlife habitat resulting from inundation. The magnitude of this reduction is a key question which cannot be quantified until more data is available. However, the basin's most sensitive moose, caribou and furbearer areas are upstream of the Watana reservoir area.

Numerous concerns have been raised regarding the potential social impacts of the project. Continual reference is made to the pipeline project. As with any large construction project, there will be unavoidable socioeconomic effects in the local, regional and state areas. However, the pipeline had a large, transient, short-term construction force, much less controllable than a large, central, long-term (10 - 15 years) workforce as would be associated with Susitna. The degree to which this workforce is selfcontained can be controlled.

The influence of people in the area is likely to have a greater impact on the local area than the project itself. If the wildlife and land use disbenefits associated with increased access outweigh the social benefits of increased access, measures can be taken to restrict access. Since total restriction is not realistic, impacts will result from human intrusion into this relatively pristine area.

The absence to date of findings of serious negative impacts suggests studies should continue. Study continuation has the supplemental benefit of substantially increasing the data base of the southcentral Alaska ecological systems, a worthwhile benefit whether the Susitna Basin is developed for its hydroelectric potential or not.

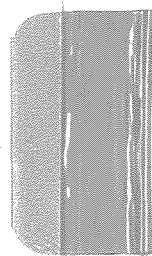
No attempt is made in this report to assess the environmental implications of alternatives to hydroelectric development of the Susitna Basin. When the requirement for this report was established, the Power Authority was responsible for assessing alternatives to Susitna hydroelectric development. However, subsequent legislation removed the study of alternatives from the Power Authority and transferred it to the Governor's office. The Governor's staff, in turn, contracted assessment of alternatives to Battelle Northwest Laboratories. In the absence of alternatives assessment, the Power Authority is unable to effectively evaluate environmental impacts stemming from those alternatives. However, the Battelle Northwest Laboratories contract includes such environmental assessments. Battelle will also independently investigate the projected need for power (which will largely influence the question of timing and degree of future power development) and they will assess the full range of alternatives to meet that projected power need. As noted previously, their assessment of alternatives will include such factors as environmental impact and their social and economic costs. Battelle's efforts are scheduled to be completed by April 1982 so that the decision-making process will have the benefit of both the Battelle findings and the recommendations of the Power Authority.

SECTION VII. ENDNOTES

- 1/ . The discussions of fisheries and wildlife were provided by Dr. Starker Leopold, member of the Susitna External Review Panel. Dr. Leopold based his presentation on his previous knowledge of the project area on interviews with study team members and on the first set of annual reports from the environmental study team. The sections on Land Use, Cultural Resources, Recreation Planning and Plant Ecology were summarized from Subtask 11.01 - Project Overview, Second draft, Acres American Incorporated, February 11, 1981, pages 10-4 through 1-25.
- 2/ . These conclusions are based on discussions with members of the Acres study team.

References

- Acres American. 1981. Watana and Devil Canyon Dam operational flow calculations with a plant factor of 0.49. (02/02/81). np.
- D'Aoust, B.C. and M.J.R. Clark. 1980. Analysis of supersaturated air in natural waters and reservoirs. TAFS. 109:708-724.
- May, B. 1981. Personal communication concerning Libby Dam supersaturation impacts. Montana Department of Fish, Wildlife and Parks. Libby, MT. April 20, 1981.



STATE OF ALASKA

JAY S. HAMMOND, Governor

ESTES ✓

DEPARTMENT OF FISH & GAME

March 19, 1981

Mr. Jeff Weltzin
Fairbanks Environmental Center
218 Driveway
Fairbanks, Alaska 99701

Dear Mr. Weltzin:

Your letter of February 12 poses several questions regarding the position of the Department of Fish and Game on enhancement of salmon fisheries in the upper Susitna River drainage. This Department is aware of the interest in salmon enhancement connected with this project and our view is presented hereafter in response to your questions.

1. *What is ADF&G's position regarding evaluation of upper Susitna salmon enhancement within the context of the Susitna studies?*

The studies being conducted in Phase I by the Department of Fish and Game on the Susitna River's fishery resources are primarily directed towards evaluating the existing anadromous and resident fish communities and their seasonal habitat requirements. This study is expected to continue until the longer Phase II program begins in July of 1982 under which we will then attempt to identify the potential impacts of the proposed two dam system on the fishery resources and outline mitigative alternatives. The long term goal of this Department with respect to potential impacts of the Susitna Hydro Project on fishery resources is to seek mitigation of these impacts to minimize any losses of the fish and wildlife resources and habitat that sustains them.

It has been the policy of this Department that a firm, individual, or governmental body constructing or developing a project is not required to mitigate impacts to fish and wildlife resources from development project which would achieve an end result that enhances the fish and wildlife resources above the overall pre-project level; rather, the constructing entity is expected to achieve a parity of production with the existing identified pre-project production and value of these resources within the areas of impact. I might note, however, that mitigation to parity by the constructing entity could occur by enhancement of fish and wildlife production and human access to the fish and wildlife resources in another location.

Our position is, therefore, that the Department would review enhancement as a possible mitigation measure for offsetting a substantial project impact on natural stocks of fish during Phase II of the studies. The Department will not request the Alaska Power Authority to address enhancement based on the conjecture that a viable enhancement project without the hydro project is possible in the upper Susitna Basin. Attempting to establish salmon runs with or without the hydropower project in the upper Susitna basin is a complex issue to evaluate in itself, and may involve possible environmental impacts on naturally occurring resident stocks which may or may not be acceptable. The study of the introductions of salmon for enhancement purposes in the upper drainage is inadvisable at this time, in our opinion, unless the Alaska Power Authority adopts a policy or position by which they commit to enhancement studies, and thereafter, commit to not only mitigation at parity of possible natural fish stock impacts, but also to enhancement of fishery stocks above existing production levels.

2. *How would ADF&G address upper Susitna salmon enhancement?*

The Department would address upper Susitna salmon enhancement based on its potential feasibility and the evaluation of its need and value in relation to proposed enhancement projects throughout the Cook Inlet area. A long term planning process for the identification of potential enhancement projects is ongoing at present by the Cook Inlet Regional Planning Team (CIRPT) composed of the Cook Inlet Aquaculture Association (CIAA), and ADF&G's Sport Fish Division, Commercial Fish Division, and Fisheries Rehabilitation and Enhancement Division (FRED). The attached memo by Ken Tarbox of the Soldotna Office of ADF&G Commercial Fish Division to Tom Walker of CIAA includes a list of known, developing, and suspected rehabilitation and enhancement projects they are reviewing presently.

Also attached for your information are two 1977 memoranda between Jim Riis, Sport Fish Division and Paul Janke of FRED, regarding the barrier to salmon mitigation in the Devil's Canyon reach of the Susitna River, and possible methods of passing fish around that barrier.

3. *Is there adequate funding in the Fish Ecology studies budget to give proper evaluation to potential and feasibility of salmon enhancement within the phase one time frame on the Susitna Studies?*

As stated earlier, the Su Hydro Aquatic Studies are not designed to expressly evaluate any one mitigation alternative, such as the feasibility of salmon enhancement in the upper Susitna Basin (with or without the proposed hydroelectric project). The Department believes the funding (as currently being renegotiated) for those project activities we are directly conducting in FY 81 and FY 82, is sufficient to support the data collection and general objectives of assessment of project impacts as outlined in the June 30, 1980 RSA. The Department has some difference of opinion with the APA regarding total adequacy of the Phase I information which will be submitted to the Federal Energy Regulatory Commission (FERC) to initiate the license application process in 1982 (refer also to the ADF&G October 1980 Plan of Study). However, APA has indicated

their commitment to the continuation of the aquatic studies into Phase II to continue answering these impact issues. In the end, the determination as to the adequacy of the data at the time of the preliminary license submission is essentially the FERC's to make. Our difference with the APA concerns the ability of their consultant group to evaluate the potential project impacts with basically one year's data on fisheries. FERC may, however, find that the data and preliminary evaluations given to that agency are sufficient to begin the licensing and EIS development processes provided that the APA and the Acres American and TES consultant groups provide a strong qualification of unresolved issues, and a plan and budget for continuing aquatic studies to assess the substance of these issues before the final decision to approve or disapprove the project is made.

4. *If adequate funding for study of upper Susitna salmon enhancement is not available in the existing Fish Ecology studies, do you plan to seek the necessary funding this session?*

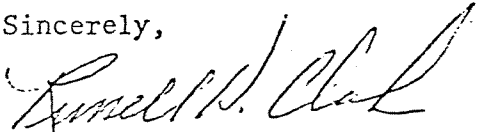
The Department does not plan to seek funding this session to specifically provide for enhancement studies in the upper Susitna basin. Most of the work being conducted under our existing program would be basic to initial studies required for determining enhancement potential of the upper basin, however.

5. *Does ADF&G consider study of upper Susitna salmon enhancement to fall under its legal mandate to manage, protect, maintain, enhance, and extend the fish and game of Alaska?*

Certainly, this is a part of our legal mandate, but functionally the resolution of enhancement potential in the upper Susitna basin is not the APA's responsibility to fund and support. The separate regional planning process in the Cook Inlet on the rehabilitation and enhancement of salmon fisheries, being conducted by CIAA and the management elements of the Department's fisheries divisions, is the mechanism by which consideration of enhancement would be scheduled, prioritized, and evaluated.

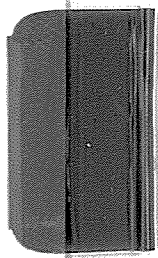
If you have further questions regarding the Su Hydro Aquatic Studies related issues from this Department's viewpoint do not hesitate to contact my office again.

Sincerely,



for Ronald O. Skoog
Commissioner
(907) 465-4100

cc: D. Wozniak, APA



STATE OF ALASKA

JAY S. HAMMOND, GOVERNOR

DEPARTMENT OF FISH AND GAME

333 RASPBERRY ROAD
ANCHORAGE, ALASKA 99502

March 9, 1981

Edward Reed
Terrestrial Environmental Specialists, Inc.
RD. 1, Box 388
Phoenix, Arizona 13135

Dear Ed:

As you know, I have had concerns about the overall study approach of the Susitna Project since its inception. In particular, I have been concerned about compatibility of big game and plant ecology studies. In correspondence and meetings between October 1979 and January 1980, we discussed this issue at length. Some modifications were made in the plant ecology studies, but it appeared that available photography would not permit the desired level of resolution in vegetation maps. Since we appeared stuck with that situation for Phase I, I decided to wait until Dr. Taber was appointed and the first vegetation maps were available for review.

At our first meeting in December 1980, Dr. Taber shared our reservations that it might be difficult to relate the vegetation maps to our animal location data in a way that would indicate habitat selectivity. We examined a number of alternatives and decided to attempt a scheme where we would classify habitat at random points using the same methods we use at animal locations. This would allow us to assess the availability of various habitat characteristics to the animal. This scheme was beyond the scope of our original studies, but we felt it was important enough to at least test the procedure during Phase I.

Last week we reviewed this scheme for the third time and took a closer look at the 1:24,000 scale vegetation maps. We reluctantly concluded that there were major problems with both approaches. The main problem is that both the maps and our aerial classifications tend to focus on overstory, yet understory is probably more important to the animals. At certain times, particularly in fall, we can classify some understory from the air but at other times we can do no better than the maps. Some habitat/animal relationships will be obvious even with crude maps, but there is a vast area of medium density spruce that appears to have a heterogeneous understory. We believe that a different approach is needed to determine habitat selectivity in such areas.

I strongly recommend that a determined effort be made to design Phase II studies that will effectively deal with the problem. Substantial expertise in ungulate/habitat relationships exists, some of it in Alaska. I feel we should enlist the aid of these individuals in the design effort. Otherwise, we are likely to waste time and money on a half baked assessment. The timing of Phase II proposals is not clear to me, but I recommend that you start the design process over the next month or so to allow maximum time for thoughtful input.

In the meantime, we will continue to collect data in a manner that will permit a simple assessment of animal use of geographic areas. We will continue to classify vegetation and other environmental parameters at all of our animal locations. When the 1:63,360 vegetation maps are available, we will test the compatibility of the maps with our aerial classifications.

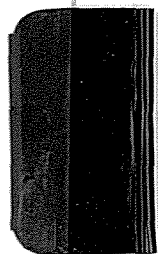
In summary, we will strive to collect our data in a manner that will be compatible with whatever final approach to impact assessment is selected so that no options will be precluded. We will gladly participate to the extent we can in designing, testing and implementing a study approach.

Sincerely,



Karl B. Schneider
Research Coordinator
Division of Game

cc: Kevin Young, Acres
Richard Taber, U. of W.
Robert Mohn, APA
Tom Trent, ADF&G



bers appointed by the

Hammond raps Canadian hydro project

Associated Press

Juneau — A hydroelectric dam proposed to be built on the Stikine River by a British Columbia firm is not warranted and "probably should not be built," Alaska's governor said Tuesday.

"I don't think it's an appropriate project. I don't think it's warranted. I don't think it's cost effective. I don't think it's viable and I think it probably should not be built," Gov. Jay Hammond said.

Hammond also said he was assured recently by British Columbia Premier William Bennett that the hydroelectric project proposed by B.C. Hydro probably would not be built.

According to Hammond, Bennett said "you can go home and tell the people there won't be a nickel spent to construct that project during my term in office."

B.C. Hydro has been conducting field studies on the Stikine and Iskut rivers since 1978, and considering construction of five dams, two on the Stikine about 140 to 160 miles upstream from the U.S.-Canada border and three on the Iskut River, a major Stikine tributary, about 50 miles from the border.

The rivers flow from British Columbia into Southeast Alaska near Wrangell and Petersburg.

The proposed dams have spurred some opposition in Canada, and also in Southeast Alaska, where fishermen are concerned the dams could harm downstream king, coho and sockeye salmon runs.

State Department of Fish and Game officials have warned that changes in stream flows even far above the salmon spawning beds could do significant damage.

Hammond said that an earlier statement he made about the hydroelectric project may have been misinterpreted. Following a meeting with Bennett in Whitehorse in late January, Hammond announced that some of his fears about the dams had been alleviated.

But Hammond said Tuesday the reason his concerns were put to rest was that he was convinced by conversations with Bennett that the project would not be built.

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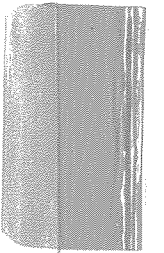
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STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

JAY S. HAMMOND, GOVERNOR

333 RASPBERRY ROAD
ANCHORAGE 99502

September 28, 1979

Mr. Eric Yould, Director
Alaska Power Authority
333 W. 4th Avenue
Anchorage, Alaska 99510

Dear Mr. Yould:

In accordance with the request in your letter of August 28, the Department of Fish and Game has reviewed the plans of study prepared by Harza Engineering, Acres-American Inc., and International Engineering Inc. to evaluate the sufficiency of the environmental studies they propose. The emphasis of our review focused on those programs and interdisciplinary tasks related to determining project feasibility and impacts with respect to fish and wildlife. We appreciate the opportunity to make this Department's recommendations with regard to the selection of a private sector consultant to conduct the Susitna Hydro engineering and environmental feasibility studies and to advise you of related issues.

In earlier correspondence to you on August 10th, the Department of Fish and Game described our expectations with regard to the development of the three consultant plans of study and the specific points we would address in a review of their products and which are summarized as follows:

1. Scope of studies - that is, the degree to which the study objectives meet biological data needs and integrate biological studies into a multi-disciplinary effort which can provide an assessment of project impacts.
2. Statutory and regulatory requirements - that is, the degree to which Federal, State and local statutory and regulatory requirements are recognized in the planning process so there are no surprises resulting in delay of the environmental assessment process to determine the project feasibility.
3. Study time frames - that is, first, the degree to which biological studies must follow the natural events of biological cycles and the physical factors of habitat and environment influencing them, to arrive at a point where our best and most

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Change over from COE
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(ADFC) evaluated
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timely judgement of project impacts and mitigation requirements can be made. And second, the degree to which project and task scheduling accomodates the development of the field staff and administrative organization to carry out studies, coordinate studies, and make logistic and equipment arrangements to maximize the results of these studies.

4. Funding - that is, the degree to which a commitment is made to guarantee equal consideration of fish and wildlife resources through all phases of the project from initial planning to construction (if the project is approved) and thereafter. Monitoring of the impacts and operation of mitigation and enhancement programs is also essential.

In reality, this Department had five plans of study before it in this review. They are:

1. Alaska Department of Fish and Game, December 1977.
2. U.S. Army Corps of Engineers, June 1978.
3. Acres-American, September 1979.
4. Harza Engineering, September 1979.
5. International Engineering, September 1979.

Overall, it is our opinion that each of these plans of study is inadequate for the reasons we discuss hereafter for each.

Alaska Department of Fish and Game December 1977

1. Scope of Studies - The scope of studies by the Department of Fish and Game basically covers the objectives for fish and wildlife investigations as viewed solely by this Department. While we did our best to cover multi-disciplinary aspects of an environmental program related to fish and wildlife resources, vegetation analysis, water quality, hydrology, recreation and socio-economics that could be conducted by the Department, the study does not display the advantages of the integration of a true multi-disciplinary effort by other specialists representing the engineering and other non-fish and wildlife disciplines.
2. Statutory and Regulatory Requirements - The current status of the National Environmental Policy Act, Fish and Wildlife Coordination Act, Coastal Zone Management Regulations, and the applicability of Alaska Statute 16.05.870, the Anadromous Fish Act, to this project are not clearly addressed.
3. Study Time Frames - The time frames fit those required to meet the fish and wildlife investigations goal of providing our best judgement of project impacts in relation to the cycles and life histories of fish and wildlife in this basin. Further, they provide the time which is essential for organizing

and administering these investigations. Important mileposts in coordination of possible alternatives for license application or EIS development are not detailed, however.

4. Funding - The budgets developed by ADF&G reflect the first steps toward a cost saving and minimization of duplication of effort that a coordinated multi-disciplinary effort could potentially provide (based upon limited data provided in the Corps of Engineers draft POS of October 1977). Interdisciplinary studies however, can and should be refined further. The budgets are the costs projected by ADF&G in 1977 dollars and don't reflect current and possibly inflationary values or costs of fish and wildlife investigations proposed by the U.S. Fish and Wildlife Service. I'd like to reiterate Commissioner Ronald O. Skoog's comment in his December 21, 1977 letter to Robert Ward, Chairman of the Alaska Power Authority, Board of Directors, transmitting this proposal, that is, "We believe from our extensive experience that we have excellent insight into what it actually costs to do business in the State."

U.S. Army Corps of Engineers, June 1978

1. Scope of Study - The biological investigations of this plan of study are the result of a limited coordination effort between the Corps and the Department of Fish and Game. Narratively, this plan of study covers the scope of task areas of the biological investigations in a manner satisfactory to the Department of Fish and Game. The plan of study also provides for the shift of certain tasks exclusively from the biological investigations to other task descriptions in hydrology and water quality, making this a better effort at an inter-disciplinary study than found in the Corps' original draft of October 1977.
2. Statutory and Regulatory Requirements - The Corps' June 1978 POS does not in our view reflect the current status or consideration of impacts of this project on fish and wildlife and mitigation in accordance with the Fish and Wildlife Coordination Act and the National Environmental Policy Act. It also does not consider the application of AS 16.05.870, the new Federal Energy Regulatory Commission and Coastal Zone Management Regulations to this project.
3. Study Time Frames - The Corps' studies were scoped into a 46 month time frame, which we believed to be inadequate. The Corps did allow, however, that continuation studies beyond the 46 month period to 60 months may be required. However, the wording in their POS implies that the construction decision will occur before completing portions of the 5 year biological studies we consider essential.
4. Funding - The Corps's attachment of a 4.3 million dollar budget to biological investigations was inadequate in this Department's view. For the 46 month time frame, we proposed a 7.9 million dollar budget in 1977 dollars.

Acres American (Acres) - September, 1979

Harza Engineering (Harza) - September, 1979

International Engineering (IECO) - September, 1979

Scopes of Study - The present consultant plans of study are scoped in varying degrees of adequacy by the three firms. IECO's proposal is deficient in both the aquatic and terrestrial segments. Acres' proposal does not have a satisfactory aquatic studies proposal but has a stronger description the terrestrial studies tasks. Harza's proposal contains the best aquatic studies presentation and has done a fair job on the terrestrial wildlife tasks also. In balance, Harza's biological investigations proposals provide for a better state-of-the-art application of study techniques and methodologies, such as radio telemetry, sonar application, and instream flow. I must point out, that although all three firms have adopted portions of the Department of Fish and Game's ideas or suggestions; the focus and results of their proposed activities are not totally in accord with the Department.

Statutory and Regulatory Requirements

All three consultant firms address FERC licensing and exhibit preparation requirements, but there is no specific discussion of the impact of the requirements of AS 16.05.870, the Fish and Wildlife Coordination Act, and Coastal Zone Management Act regulatory requirements regarding coordination, planning, and environmental protection in relation to this project.

Study Time Frames - All three firms were constrained to a 30 month time frame to FERC license application in accord with the APA contract specifications. IECO does emphasize a three-year study on anadromous species and a two-year study on large mammals but this is inconsistent with this Department's view of a required five-year study on some populations and habitats. Both Acres and Harza more strongly emphasize the continuation of fish and wildlife investigations. We believe that APA must give the contractor for the final POS stronger direction to provide for the review of pre-FERC license studies, and provide a mechanism for the review, redirection and continuation of selected projects post-FERC license application.

Budgets - Because of the relatively short review time afforded this Department, we could not make an adequate assessment of the merits of the three consultant firms' POS budgets. Their interdisciplinary study plans and scoping of fish and wildlife tasks were not specifically budgeted in all cases. The numbers of personnel dedicated to fish and wildlife tasks detailed by two of the consultants (Acres and Harza) is also difficult to breakdown. We can only leave our final evaluation on the adequacy of the fish and wildlife investigations budgets to the one submitted in the final POS.

At this juncture, we recognize that the selection of a consultant to prepare a final POS and to implement the studies involved must be based on factors involving not only the fish and wildlife investigations. This Department desires to assure that the best final POS is developed. To accomplish this, we believe the fish and wildlife agencies must be the key participants in the development of the final POS. The consultant

firm selected should be one which has developed the best overall plan of study. That firm and the APA will have to make a commitment to synthesize a new final plan of study incorporating the concerns of the fish and wildlife agencies which meets our special statutory mandates for the protection of fish and wildlife resources. Funding for this planning and coordination will be required by ADF&G.

I would like to advise you here of some of the requirements of the Fish and Wildlife Coordination Act, Fish and Game Code, (Title 16), and Coastal Zone Management Act which can influence this project.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act, draft Uniform Procedures for compliance, May 1979 further standardizes procedures and interagency relationships to insure, "that wildlife conservation is fully considered and weighed equally with other project features in agency decision-making processes by integrating such considerations into project planning, National Environmental Policy Act (NEPA) compliance procedures, financial and economic analyses, authorization documents, and project implementation."

Subpart B-FWCA Compliance Procedures

Sec. 410.21 Equal consideration.

Equal consideration of wildlife resource values in project planning and approval is the essence of the FWCA compliance process. It requires action agencies to involve wildlife agencies throughout their planning, approval, and implementation process for a project and highlights the need to utilize a systematic approach to analyzing and establishing planning objectives for wildlife resource needs and problems and developing and evaluating alternative plans.

Sec. 410.22 Consultation

(a) Initiation. The FWCA compliance process may be initiated by a potential applicant, an action agency, or a wildlife agency.

(b) Potential Applicants. Implementing procedures of action agencies shall provide that applicants for those non-federal project approvals which require a water-dependent power project approval from the Federal Energy Regulatory Commission (FERC) (also applies to preliminary FERC permit) contain written evidence that they initiated the FWCA compliance process with both Regional Directors and the head of the State wildlife agency exercising administration over the fish and wildlife resources of the state(s) wherein the project is to be constructed and early site review (NRC) applicants. The intent of this paragraph (a)(1) of this section is to assist applicants in designing environmentally sound projects without waste of their planning resources and to minimize the potential for delay in the processing of applications. Action agency implementing procedures shall advise that consultation should be initiated by the applicant at the earliest stages of its project planning, and that its submissions to wildlife agencies shall indicate the general work or activity being considered, its purpose(s), and the general area in which it is contemplated.

In order to comply with these procedures, APA should initiate the process of consultation with the fish and wildlife agencies.

Title 16

Title 16, independently of Federal laws, mandates the Alaska Department of Fish and Game to manage, protect, maintain, enhance, and extend the fish, game, and aquatic plant resources and the habitat that sustains them including assisting the U.S. Fish and Wildlife Service in the enforcement of federal laws and regulations pertaining to fish and wildlife.

Sec. 16.05.870 also states that:

b) If a person or governmental agency desires to construct a hydraulic project, or use, divert, obstruct, pollute, or change the natural flow or bed of a specified river, lake or stream, or to use wheeled, tracked, or excavating equipment or log-dragging equipment in the bed of a specified river, lake, or stream, the person or governmental agency shall notify the commissioner of this intention before the beginning of the construction or use.

c) If the commissioner determines to do so, he shall, in the letter of acknowledgement, require the person or governmental agency to submit to him full plans and specifications of the proposed construction or work, complete plans and specifications for the proper protection of fish and game in connection with the construction or work, or in connection with the use, and the approximate date the construction, work, or use will begin, and shall require the person or governmental agency to obtain written approval from him as to the sufficiency of the plans or specifications before the proposed construction or use is begun.

Purpose. - The purpose of this section is to protect and conserve fish and game and other natural resources. 1964. Att'y Gen., No. 10.

Alaska Coastal Management Program

The recently approved Alaska Coastal Management Program (ACMP) mandates that all State, Federal and Local government agencies must coordinate all planning and development activities in the State's coastal zone to ensure adequate consideration and protection of Alaska's coastal waters and resources. As the proposed Susitna Hydropower project will occur within Alaska's coastal zone and certainly will directly influence coastal waters all planning and development plans must be consistent with the Coastal Standards and the Mat-Su Borough's District Coastal Plan once it is completed and approved. The Coastal Standards are presently in effect and all State and Federal actions must be consistent with them. Section 6 AA C 80.130 states that:

- (a) habitats in the coastal area which are subject to the Alaska Coastal Management Program include:
- (1) offshore areas
 - (2) estuaries
 - (3) wetlands and tidal flats
 - (4) rocky islands and sea cliffs

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- (5) barrier islands and lagoons
- (6) exposed high energy coasts
- (7) rivers, streams and lakes
- (8) important upland habitat

These habitats which are specifically defined in the Standards must be identified within the Susitna Hydro Study area during the feasibility studies. In addition, Section (b) states that habitats contained in (a) of this section shall be managed so as to maintain or enhance the biological, physical and chemical characteristics of the habitat which contributes to their capacity to support living resources. Specific guidelines are also provided for each coastal habitat. The Coastal Zone Management consistency requirements are mandated in both the Alaskan and Federal CZM Acts and the Fish and Wildlife Coordination Act. The question of consistency with CZM standards goes well beyond the FERC licensing requirements and should be treated as a separate step in determining the feasibility of Hydro Power alternatives.

Thank you for the opportunity to comment, we expect to provide more information to you during the next weeks regarding the development of a final POS.

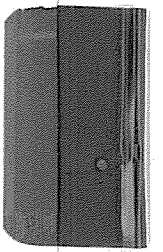
Sincerely,


Thomas H. Trent,
Regional Supervisor
Habitat Protection Section

cc: Commissioner R.O. Skoog, Juneau
Directors, ADF&G, Juneau
Murray Walsh, OCH, Juneau
Keith Schreiner, USFWS, Anchorage
Rep. Brian Rodgers, Fairbanks
Rep. Rick Halford, Chugiak

bcc: Regional Supervisors - HPS
Regional Supervisors - Anchorage
Dave Sturdevant - ADEC, Juneau
C. Estes
N. Calvert
K. Schneider
P. Krasnowski

TWT:eh



Trustees for ALASKA

835 D Street #202, Anchorage, Alaska 99501 (907) 276-4244

March 12, 1979

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MAR 15 1979

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Fairbanks, Alaska

Paul H. Vlachler
Assoc. Prof. of Ed.
Fairbanks, Alaska

Commissioner Ronald O. Skoog
Alaska Department of Fish & Game
Support Building
Juneau, AK 99801

Dear Commissioner Skoog:

I have been following the Susitna Dam project and am interested in learning more about your Department's views on the proposed project. Since ADF & G has exhibited much interest in the area surrounding the proposed dam, your views will be especially useful to those evaluating the proposed project. In particular, I would like to find out:

1. How ADF & G plans to cooperate with the Corps of Engineers, the U.S. Fish & Wildlife Service, and the Alaska Power Authority in coordinating studies to be done, and goals to be accomplished during the feasibility study.
2. What sorts of studies are needed before the feasibility of the dam, from the viewpoint of its effects on fish and wildlife, can be determined.
 - a. How much time will be needed to complete the studies. This time estimate should include study planning and analysis.
 - b. How much money will be required to conduct the studies. If possible this should be broken down into dollar amounts needed for each year of study.
3. In light of past studies conducted in the area, what is the Department's current view regarding potential impacts of the proposed project, on fish and wildlife in the area?

I would also appreciate receiving any copies of ADF & G reports relevant to the proposed project.

Thank you for your help. I look forward to receiving your reply in the near future.

Sincerely yours,

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Trustees for ALASKA

835 D Street #202, Anchorage, Alaska 99501 (907) 276-4244

March 12, 1979

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Attorney
Seattle, Wash.

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Fairbanks, Alaska

Paul H. Vlachler
Assoc. Prof. of Ed.
University of Alaska
Fairbanks, Alaska

Commissioner Ronald O. Skoog
Alaska Department of Fish & Game
Subport Building
Juneau, AK 99801

DEPARTMENT OF THE LAND

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Thank you for your help. I look forward to receiving your reply in the near future.

Sincerely yours,

March 30, 1979

Ms. Suzanne Weller
Trustees for Alaska
835 "D" Street #202
Anchorage, Alaska 99501

Dear Ms. Weller:

I have enclosed two documents which should largely answer the questions you posed in your letter of March 12. Our comments on your questions are summarized below.

Question:

1. How the Department of Fish and Game plans to cooperate with the Corps of Engineers, the U.S. Fish & Wildlife Service, and the Alaska Power Authority in coordinating studies to be done, and goals to be accomplished during the feasibility study?

Answer: The Department of Fish and Game hopes to insure that the biological studies proposed in the June 1978 Phase I Plan of Study (POS) for the Susitna Hydro Project are carried out. We will be coordinating our activities with each of the above mentioned and other agencies in an attempt to insure that all studies outlined in the POS are conducted and all requirements of State and Federal law are satisfied.

2. What sorts of studies are needed before the feasibility of the dam, from the viewpoint of its effects on fish and wildlife, can be determined?

Answer: The biological investigations proposed in the June 1978 POS identify the basic biological investigations which we believe are necessary and required to assess the feasibility of the Susitna Hydro Project.

Refers only
to COE
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Attach memo

ALASKA DEPT. OF
FISH & GAME
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March 30, 1979

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ALASKA DEPT. OF
FISH & GAME

APR 9 1979
HABITAT
REGIONAL OFFICE

Ms. Suzanne Weller
Trustees for Alaska
835 "D" Street #202
Anchorage, Alaska 99501

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*Refers only
to COE
proposal.*

March 30, 1979

- a. How much time will be needed to complete the studies? This time estimate should include study planning and analysis.
- b. How much money will be required to conduct the studies? If possible, this should be broken down into dollar amounts needed for each year of study?

Answer (a & b): Please refer to the enclosed briefing document entitled "Susitna Hydro Biological Investigations." It includes a commentary on the budgets proposed by ADF&G for the full term 46 month feasibility investigations of the Phase I POS and our views on the need for a five year study in lieu of the shorter, 46 month investigation.

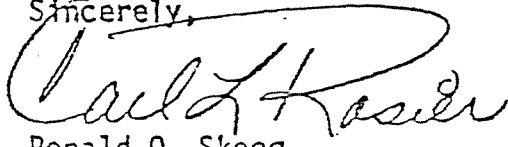
3. In light of past studies conducted in the area, what is the Department's current view regarding potential impacts of the proposed project, on fish and wildlife in the area?

Answer: Please refer to the appropriate section of the "Susitna Hydro Biological Investigations" briefing document and our 1978 report to the U.S. Fish and Wildlife Service, "Preliminary Environmental Assessment of Hydroelectric Development on the Susitna River."

The Department of Fish and Game appreciates your interest in the proposed Susitna Hydro biological investigations. If you have further questions regarding our involvement in the feasibility studies, please contact Thomas Trent, Regional Supervisor of the Habitat Protection Section in Anchorage, telephone 344-0541, extension 133.

Thank you for your inquiry on this matter. I hope this material will prove useful to you.

Sincerely,


Ronald O. Skoog
Commissioner

cc: T. Trent

bcc: C. Estes

ROS:RL:TWT:mr

3/30/79
Attachment

Susitna Hydro Biological Investigations

I. Background

The Alaska Department of Fish and Game (ADF&G) has been actively involved in coordinating, proposing, and conducting biological studies related to the Susitna Hydropower Project since 1974. From that time to today, we have had many problems in attaining the scope of study and funding the Department believes is necessary to adequately assess the biological impacts of this proposed hydropower development.

Initially our concerns were not only limited to funding of adequate studies, but also included geographic areas which would be studied. Early on in the Susitna Hydro environmental assessment, the Corps of Engineers (COE) restricted our work to the immediate impoundment area and downstream to the confluence of the Chulitna River. One gain we feel we have made is the consideration of the impacts of this project, the largest hydro development in North America, on the downstream environment below the Susitna dams and the area above the impoundment.

The Department of Fish and Game, through its data review of possible fish, wildlife and other environmental impacts of the Susitna Hydro project has identified a number of concerns. As a data base we have only a

limited amount of environmental assessment work the Department has done to date. We believe the assessment of fish and wildlife resources impacts in Phase I of the Susitna Hydro studies are fundamental to the determination of this project's feasibility. If the project proves feasible, these biological studies are basic to the mitigation of fish and wildlife impacts when the project is constructed.

A. Fisheries Studies Background

Background knowledge of the Susitna River basin is limited. The proposed hydroelectric development necessitates gaining a thorough knowledge of its natural characteristics and fish and wildlife populations prior to final dam design approval and construction authorization to enable protection of the aquatic and terrestrial communities from unnecessary losses.

The Susitna River basin provides important habitat to a wide variety of fish species, both resident and anadromous. Five species of Pacific salmon (chinook, coho, chum, pink, and sockeye) utilize the Susitna River drainage for spawning and rearing. The majority of the chinook, coho, chum, and pink salmon production in the Cook Inlet area occurs within this drainage. Grayling, rainbow trout, Dolly Varden, burbot, lake trout, whitefish, and sculpins are some of the more common and important resident fish species.

Baseline environmental fisheries studies have been conducted by ADF&G intermittently since 1974. The projects were financed with

Federal funding averaging \$29,000 per year in 1974, 1975, and 1976, and an allocation of \$100,000 in 1977. The National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) first contracted ADF&G to conduct a one-year assessment of salmon populations utilizing the Susitna River in the vicinity of the proposed Devils Canyon dam site during 1974. The objectives of these studies were to determine the adult salmon distribution, relative abundance, and migrational timing and to determine juvenile rearing areas (Barrett, 1974). Funding was received in 1975, 1976, and 1977 from USFWS to continue and expand these studies and to monitor the physical and chemical parameters associated with the mainstem Susitna (USFWS, 1976; and Riis, 1977). Additional baseline studies were not initiated during 1978 due to lack of funding. A characteristic of ADF&G fish and wildlife studies to date on the Susitna Hydro Project area has been the discontinuity, uncertainty, and low levels of funding from several sources.

B. Wildlife Studies Background

The Susitna River basin has long been recognized as an extremely rugged wilderness area of high aesthetic appeal and as an important habitat to a wide variety of terrestrial wildlife species (ADF&G, unpubl. data). Most important to sport and subsistence users are moose and caribou, and to a lesser extent, grizzly bear and sheep. Hydroelectric development has been under consideration in this area for a number of years and some very general ungulate population

assessment work was begun in 1974 and completed in the spring of 1975 (USFWS, 1975). Additional studies were not conducted in the project area until March of 1977 when limited funds were made available to begin acquiring baseline information on moose and caribou populations within and adjacent to the project area. Funds received by Game Division for work to date were \$2,000, \$14,500, \$46,700, and \$16,500 for FY 74, FY 75, FY 77-78, and FY 78-79, respectively.

C. Evolution of the Proposed Phase I Susitna Hydro Biological Investigations

1. 1975 Proposal

The ADF&G entered its first comprehensive proposal for fish and wildlife investigations to the USFWS, and through that agency to the COE, on November 18, 1975. That proposal spread investigations over a five year period from FY 77 through FY 81, and indicated a cost of 3.62 million for ADF&G field work. To that figure should be added an additional cost for USFWS and NMFS coordination of \$525,000, and therefore a total cost of 4.145 million dollars for proposed fish and wildlife work.

Estimated cost of the Susitna Hydro Project construction in 1975 was 1.5 billion dollars.

2. 1977 Proposal

On December 15, 1977, the ADF&G completed a review of the COE

prepared draft Susitna Hydropower Plan of Study (POS) of September 1977. In our comments to that document, we included the Department's estimate of fish and wildlife and habitat investigation costs and our recommendation of needed studies. Total costs for ADF&G field investigations for a five year period totaled 10.5 million dollars. This increase over 1975 was due not only to inflationary factors, but also because our limited studies from 1974 through 1977 indicated new problem areas where impacts on fish and wildlife must be assessed.

Estimated construction cost for the Susitna Hydro Project in 1977 was 2.1 billion dollars.

3. 1978 Proposal

The Department revised its December 1977 proposal early in 1978 to fit the 46 month time frame for Phase I studies which the Alaska Power Authority (APA) and COE said would be imposed. The Department objected then, and still does, to the compression of the time frame for biological investigations. My staff believes quite strongly that a minimum five year period is needed for an adequate biological study of the Susitna River Basin. The area encompassed is large and complex. Anadromous fish runs, for example, pose special problems of study because some salmon stocks have a five year life cycle.

In the June 1978 Susitna Hydropower Plan of Study, the COE gave some recognition to the need to complete fish and wildlife studies covering complete life cycles by stating in paragraph 2 on page 40 of the POS that: "some of the biological studies will require continuation through step 3 into construction to provide a base of life cycle, habitat, and other information needed to outline possible mitigation studies." However, we have no guarantee that funding to support these continuation studies will be made available. Furthermore, the preceding POS statement infers that the construction decision will occur before completing portions of the biological studies that are necessary for making the project feasibility decision. This clearly is in conflict with the Council on Environmental Quality Proposed Regulations under NEPA of June 9, 1978.

The Department's latest total budget recommendation of 7.9 million dollars for 46 months for Phase I feasibility investigations related to fish and wildlife was submitted to the Corps on April 19, 1978. The Corps and APA, over our objections, finally included a budget of 4.3 million dollars in the Susitna Hydro POS in June of 1978, a difference of 3.6 million dollars. This is a difference we find hard to resolve considering the job we must do to adequately assess the feasibility of this proposed project.

An independent analysis for Sport Fish Division by Milo Bell, a consulting engineer with extensive experience on Pacific Northwest hydro projects and fisheries related studies in Washington, indicated the fisheries feasibility investigations for a hydro project the size of Susitna Hydro would run to about 5.0 million dollars, a figure comparable with our own estimate of 5.1 million dollars.

Estimated construction cost of the Susitna Hydro Project at this time, March 1979, is 2.6 billion dollars.

Therefore, the Department has seen the cost of the Susitna Hydro Project rapidly escalate from 1.5 billion dollars in 1975 to 2.6 billion dollars in 1979, a 73 percent increase. Meanwhile, the proposed budget for support of fish and wildlife studies has gone from 4.145 million dollars in 1975 to 4.3 million dollars (imposed by the Corps and APA), a 3.7 percent increase.

4. 1979 Proposed One Year Funding of Fish and Wildlife Biological Investigations Funding

On November 3, 1978, the Department was contacted by the Corps of Engineers with a request to provide our estimated budget for 1979 biological investigation adjusted from our prior fiscal year development to a calendar year and on a quarterly basis for the 1979 calendar year by November 4, 1978. These figures developed by ADF&G were:

<u>1979</u>	<u>1st</u> <u>Quarter</u>	<u>2nd</u> <u>Quarter</u>	<u>3rd</u> <u>Quarter</u>	<u>4th</u> <u>Quarter</u>
Anadromous Fish Studies		\$115,000.00	\$115,000.00	
Resident Fish Studies		80,000.00	250,000.00*	\$ 43,000.00
Aquatic Plants & Animals		5,000.00	99,000.00	30,000.00
Economic Studies		10,000.00	15,000.00	
Support & Planning	\$10,000.00	32,000.00	90,000.00	
Wildlife Studies		20,000.00	80,000.00	150,000.00
	<u>\$10,000.00</u>	<u>\$252,000.00</u>	<u>\$649,000.00</u>	<u>\$223,000.00</u>

*Sonar Development

II. Constraints and Things to be Done

A. Planning and Coordination

The Department's involvement with Susitna River Hydro Project has, in the past, been characterized by the implementation of short term projects, hastily contrived out of necessity, without the opportunity for long term and ongoing planning.

Due to the nature, magnitude, and complexity of the biological investigations necessary to assess the impacts of this project, detailed and comprehensive planning is essential. Only following this period of preparation can we insure the adequacy of fiscally responsible biological studies designed to fully assess project impacts.

In the first two quarters of this Department's proposed work on the Susitna Hydro biological investigations, we have a great need to do more detailed planning of specific project activities, methodology, and development of the organization and of the expertise to effectively carry through our proposed investigations and assure their integrity.

We consider it essential the very best expertise in the field of hydro projects be utilized during this planning process. This may necessitate contracting various qualified personnel from the northwest where the "state of the art" is well developed. It will likely necessitate travel to these northwestern states by key personnel to consult with qualified individuals and organizations.

A good deal of interagency coordination will be necessary and mutual fielding of various projects will require planning and organization. For example, we know the U.S. Fish and Wildlife Service will conduct specific study segments and the U.S. Geological Survey yet others. In the interest of economy and obtaining the best results, these activities require coordination.

We feel strongly that suitable time must be allocated to the process of planning and coordination before any field staff are hired, or biological studies fielded if adequate professional level results are expected.

Outcomes of the planning effort should be:

1. a table of organization for the administrative support and field staff to direct and carry out the biological investigations

2. the development of job descriptions and specific work plans and subcontract work items for Department biological investigations
3. the timetables for training personnel, development of special equipment, and the state of the art methodologies, and subcontracts for field studies.

B. Personnel

A project of this magnitude will necessitate employing personnel who possess both experience and knowledge of specific disciplines. For example, we will need people who are experts in the field of hydrology as it relates to fish and wildlife, those with engineering background, those capable of performing complex water/wildlife computer modeling, etc. It is going to be necessary for this Department to go outside its own organization to recruit many of these individuals, as we, to date, have not experienced the need which creates experience in these disciplines.

It should be understood that this hydro evaluation is going to require a staff of experts who work ~~solely~~ on this project. We cannot expect a biologically sound study to occur with adequate, professional solutions and answers if it is conducted on a part time basis by existing Department staff, as in the past. Personnel

constraints are particularly binding for the fisheries related work, because the Department's fisheries division staff are totally dedicated to management and research problems in other areas. There simply has to be a staff of qualified individuals, with the employment guarantees necessary to provide continuity to long term studies.

C. Funding

While the adequacy, or inadequacy of funding to perform fish and wildlife studies has been a major Departmental concern over the past several years, the continuity of it in the future is even a greater one. As this hydro project and initiation of the long term biological studies nears reality, it is paramount that money be appropriated for more than a few months or even a single fiscal year at a time. The accomplishment of the biological studies will require long term contracts for work, equipment development, and the maintenance of a qualified professional level staff. Personnel qualified to plan and conduct the involved research necessary to assess the impacts of the Susitna Hydro Project, cannot be recruited without long term employment guarantees.

Timing of funding appropriations are, and will continue to be, of critical importance; and again support the need for funding beyond a given fiscal year. For example, many of the studies can only be conducted at brief seasonal periods of the year due to particular,

stream flow needs, migrational movements of wildlife, or spawning migrations of a specific fish species. To miss one of these periods, due to money appropriation difficulties, is to miss an entire study year.

D. Equipment and Material Aquisition

A great amount of materials, equipment, and scientific gear will be required for these studies. Much of it will require ordering well in advance. Major sonar and telemetry development is anticipated for fish migrational studies.

Many of these items will be ordered in one fiscal year and perhaps not received until the next one. Again, monies must be available beyond a single year. If funding terminates, we will likely have a number of commitments to purchase special equipment which will have to be honored.

E. Summation

Without continuity of funding beyond a single fiscal year, the personnel to plan and conduct the hydro related studies cannot be adequately recruited and/or retained. The large sum of money which may be authorized will, under these circumstances, be of little use.

The Department is being asked to participate in a biological evaluation of the largest hydroelectric project ever planned. It is critically important the project be planned, conducted, and finally assessed in a manner which brings credit to the State and which minimizes fish and wildlife resource protection and mitigation of project impacts.

The guarantee of continuity in study funding and timing may be the single most important factor in achieving this goal.

II. Potential Impacts

A. Fisheries

1. With considerable study of the project's impact on fish and wildlife resources yet to be accomplished, the ADF&G has collected sufficient information and addressed the potential biological impacts of the Susitna Hydro proposal in a number of documents which allow us to state that fish and wildlife resources will be adversely impacted.

The construction and subsequent operation of the Devils Canyon and Watana dams will result in long-term ecological changes. The two dams will inundate an estimated 50,550 acres of the Susitna River Basin aquatic and terrestrial habitat upstream of Devils Canyon. Regulation of the mainstem river will substantially alter the natural flow regime downstream.

Secondary impacts such as improved road, water, and floatplane access may create some additional problems in regulating hunter and fishermen harvest.

Following is a brief summation of the major impacts of the proposed dams illustrating the importance of comprehensive biological studies to determine the extent these impacts will affect fish and wildlife populations.

Susitna Fisheries and Aquatic Habitat

The fish populations are the most obvious aspects of the aquatic community where impacts will be evident due to their high economic and recreational importance to the people of Alaska and the nation. However, impacts are not limited to the fishery resource alone due to the complex interrelationships between all biological components of, and within, the aquatic community and the associated habitat. Our preliminary studies have partially defined that the effects of impoundment and construction activities will include alteration of the natural flow regimes, water temperatures, water chemistry, transport of materials, and the quantity of wetted habitat. Habitat requirements of the critical life history phases for passage, spawning, egg incubation, and juvenile rearing of the Susitna salmon species studied are quite specific. The USFWS Cooperative Instream Flow Service Group has developed criteria which

demonstrate the narrow tolerances of certain salmonid and resident species to the hydraulic parameters of velocity, depth, substrate, and temperature (Bovee, 1978). The seasonally wide fluctuations of water velocity, depth, temperature, substrate and sediment of the free flowing mainstem Susitna, its sloughs and tributaries determine the availability and accessibility of salmon habitat. Thus, any alterations to the existing Susitna aquatic ecosystem which restrict or reduce the availability of required habitat, will also reduce fish production in the Susitna Basin and Cook Inlet estuary.

For example, it is important to note that although the Susitna River is glacial and turbid more than half of the year, the river clears during the winter months and becomes the major winter rearing area for salmonids as they migrate from the clearwater tributaries and sloughs which freeze and dewater. Chinook and coho salmon, which are of high interest to both commercial harvesters and sport anglers in the Cook Inlet area are dependent on these freshwater rearing areas of the Susitna for a period of one to two years before migrating to saltwater. These important rearing areas will be lost downstream of the dams because the river will be turbid year round and have a higher water velocity due to a reversal of the natural seasonal flow and stage conditions after construction. Although total salmon escapement estimates have not been derived for this system, it is probably the second or third largest sockeye

salmon production area within Cook Inlet. Economically, the estimated average annual commercial value of the sockeye, king, pink, chum, and coho Susitna salmon stocks was \$8,721,780 in 1975. This does not include the 1975 estimated value of \$3,701,745 for the additional salmon in the Susitna River Basin necessary for producing this estimated potential catch. Although figures for subsequent years are unavailable because of insufficient data, it can be assumed the value of this fishery has greatly increased.

Economic values related to recreation are unavailable but assumed to be high due to high concentration of the population adjacent to the Susitna River. Non-consumptive economic values are also unavailable.

B. Terrestrial Wildlife

2. The proposed Susitna Hydropower Project will have impacts on several wildlife species which either reside in the project area, use the area for migration or other seasonal purposes or use habitat downstream which will be altered by the stabilization of water flow. Although many species of animals could be potentially influenced, terrestrial studies to date have focused on ungulate populations, primarily moose and caribou.

Moose

Moose are likely to be adversely affected in several ways.

1. Loss of habitat by inundation within the impoundment areas.

Preliminary studies indicate that several moose subpopulations occupy drainages flowing into the impoundment areas. These moose spend much of the year outside of the impoundment areas but each winter tend to migrate into or across these areas. Much winter range will probably be lost. This will be particularly critical in severe winters. Therefore, a substantial reduction in the number of moose in a large area surrounding the impoundments will probably occur.

Moose numbers are currently reduced in the area probably because of a combination of severe winters and predation. Therefore, hunter harvest has been restricted in recent years. However, an average of 146 are taken annually by 475 to 500 hunters from the moose subpopulation that will probably be impacted directly by the impoundments. This comprises about 3.5 percent of the statewide harvest of moose. However, the importance of the area to hunters is expected to increase as new National Parks and private land holdings restrict the area available to many hunters. If there were a 50 percent reduction in these moose subpopulations, there could be a loss of harvest of over 7500 moose over the 100 year life span of the project.

The reduction in moose densities could also lead to chronic predation problems. The impact on non-consumptive use of moose is difficult to estimate at this time. The Watana impoundment is expected to impact more moose than the Devils Canyon.

2. Loss of browse downstream.

The river bottom downstream to Cook Inlet provide winter range for moose from Game Management Units 13, 14, and 16. Stabilization of water flows may cause much of the willow in this area to be replaced by spruce. This could lead to a reduction in moose numbers in all of these units especially in severe winters. Adequate data are not presently available to even roughly estimate the magnitude of this impact.

3. Accidents

Moose, especially calves, frequently become mixed in mud. Ice shelving caused by winter drawdown also could lead to accidental moose deaths. The Watana impoundment would greatly increase the potential of fatal accidents but there is no way to estimate the importance of this at present.

Caribou

While some loss of caribou habitat may occur, the greatest impact would be through blockage of migrations. In past years, many caribou have migrated across the Susitna River in the impoundment area after calving. Although specific harvest data on the Nelchina caribou herd for this area are currently unavailable, major harvests of these caribou occurs in the vicinity of the Denali Highway during years of high numbers of caribou migration across the Susitna River. At the present time, it is not known if the impoundments will block the caribou from portions of their range or whether they will attempt to cross or go around the impoundments. It could lead to overgrazing of portions of the range and abandonment of other areas or increase mortality due to accidents in attempts to cross the impoundment.

Other Species

The impoundments will almost certainly reduce numbers of bears, wolves, wolverines, other furbearers, small game, and non-game species through loss of habitat. Furbearers and waterfowl may be reduced downstream as a result of altered water flow and fluctuations in the river that are important in providing the stimulus for new riparian vegetative succession with plant species important to these wildlife populations.

A small population of Dall sheep may be adversely affected by disturbance during construction unless human activities, particularly aircraft traffic are controlled.

C. Socioeconomics and Recreation

It is important to recognize that any direct or indirect biological impacts of this project may, and likely will, affect the recreational and/or commercial utilization of major salmon and resident fish species, and wildlife species and their associated habitat. The close proximity of municipalities containing half the human population of Alaska emphasizes the socio-economic values of the fish, wildlife, and habitat resources of the Susitna River Basin. The Susitna drainage is highly used and important to the sport and commercial fisherman, the recreational enthusiast, industry, and municipalities. The popularity of Denali State Park and nearby Mt McKinley National Park further attests to the high social, recreational, and aesthetic qualities of the area. Specific data on these subjects in the hydroelectric project area watersheds are incomplete or lacking. Adding to the importance of the area for fishing and hunting is the enactment of the D-2 and Antiquities Act provisions on other lands where certain recreational uses may be restricted.

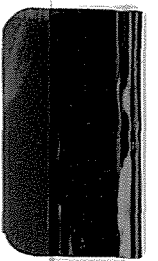
D. Navigability

Much of the Susitna River drainage downstream of the proposed hydro development is one of major recreational development. Stream side

recreational sites and subdivisions are markedly increasing the numbers of people utilizing the river for transportation during both the summer and winter seasons.

It is unknown to what degree the substantial change in natural stream flows may affect travel and transportation (both recreational and commercial) of these downstream river portions. They may, however, be quite significant.

3/7/79



ESTES

September 7, 1978

SKoon
to
Gravel
refers to
article

Honorable Senator Mike Gravel
United States Senate
3121 Dirksen Senate Office Building
Washington, D.C. 20510

Dear Senator Gravel:

I have just completed reading an article attributed to you in the recent issue (Vol. VI, No. 2) of Catalyst. In your article, you discuss the great potential for hydroelectric development in Alaska and the need to properly plan for such development and other land uses. I could not agree with you more that the key to the future orderly development of Alaska's land and water resources lays in proper and timely planning. It is the issue of planning for fish and wildlife needs that prompts my concern with your Catalyst article.

The proposed Susitna River hydroelectric project is presented in your article as a project embraced by environmentalists and having no effect on fish life. As to the former assertion, I have no comment. I am, however, concerned with the abrupt dismissal of the fishery values of the Susitna River represented in your latter statement.

The main purpose of this letter is to appraise you and your Washington staff of the progress to date by the Department of Fish and Game's field staff in compiling baseline pre-impoundment fish and wildlife resource data. The Alaska Department of Fish and Game has conducted baseline environmental fisheries studies since 1974 in the upper and lower Susitna River drainages with limited financial support from the National Marine Fisheries Service and the U.S. Fish and Wildlife Service. Federal funding of this Department's activities terminated December 31, 1977, with considerable study of the project's impact on fish and wildlife resources yet to be accomplished, but with sufficient information on hand to allow us to state that fish and wildlife resources will be adversely impacted. The construction and subsequent operation of the Devils Canyon and Watana dams will result in long-term ecological changes. Most notably, the level and flow patterns of the Susitna River will be altered in significant ways and will create adverse impacts to fisheries resources both upstream and, more importantly, downstream of the proposed dams.

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For example, chinook and coho salmon, which are of high interest to both commercial harvesters and sport anglers in the Cook Inlet area are dependent on the freshwater rearing areas of the Susitna for a period of one to two years before migrating to saltwater. These important rearing areas will be lost downstream of the dams because the river will be turbid year-round and seasonal flow and stage will be the reverse of natural conditions after construction.

Our preliminary studies have partially defined that the effects of impoundment and construction activities will include alteration of the natural flow regimes, water temperatures, water chemistry, transport of materials and the quantity of wetted habitat. These changes will disrupt the trophic structure and habitat composition downstream from the dam, and will eventually reduce or eliminate certain terrestrial and aquatic populations.

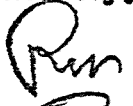
In response to your recent comments, I have concentrated herein on fisheries issues. Fisheries studies relating to the Hydroelectric Project on the Susitna were not conducted this year due to lack of funding; however, wildlife associated studies were continued with \$16,500 in State funds. When Federal assistance lapsed, the Alaska Power Authority recognized the economic and biological benefits of continuing moose radio-telemetry studies with presently radio-collared animals and provided the necessary funding.

Additional Federal funding, unfortunately, terminated due to U.S. Corps of Engineers priorities in other areas. Your article referred to the Phase I activities relating to the Susitna Dam: "At present, the Corps is at the proposed sites conducting Phase I activities, which include complete design and cost/benefit analyses as well as a Final Environmental Impact Statement." Actually, the Corps of Engineers is conducting their foundation studies at the damsites while no fisheries work is underway at the present time. Without adequate funding and sufficiently timed preconstruction Phase I studies to further assess and define the magnitude of impact from the proposed construction activity and from operation of the facilities, a final Environmental Impact Statement cannot be prepared and will result in a delay of a construction decision. It is important to note that mitigation features have not yet been defined to offset anticipated impacts to fish and wildlife resources between the impoundment area and downstream from the dam site.

September 7, 1978

I hope that my comments and the enclosed draft on this Department's 1977-78 field progress report will assist you in evaluating this important project. Please feel free to call me for any additional information. There is the serious matter of funding to continue our pre-impoundment studies, and as a member of the Environmental and Public Works Committee perhaps you could assist in this regard.

Sincerely,


Ronald O. Skoog
Commissioner

Enclosure

cc: Honorable Ted Stevens
Honorable Donald E. Young

bcc: T. Trent
R. Andrews
R. Logan

not skill
Corps

Catalyst

For Environmental Quality
274 Madison Avenue, New York, N.Y. 10016

Vol. VI, No. 2, 1978

CATALYST is concerned with the total environment. It aims to help people restore a quality environment and prevent new damage. CATALYST thus attempts to act as a "transmittal belt" for the transfer of pollution control and environment enhancement knowhow—to the end that it may serve as a catalytic influence in getting relevant knowledge, research and skills put to use.

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CATALYST is concerned with the total environment. It aims to help people restore a quality environment and prevent new damage. CATALYST thus attempts to act as a "transmittal belt" for the transfer of pollution control and environment enhancement knowhow—to the end that it may serve as a catalytic influence in getting relevant knowledge, research and skills put to use.

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ENERGY IN ALASKA

By United States Senator
Mike Gravel

*Income from non-renewable petroleum
is providing the key to a
renewable resource future
in Alaska, including development
of hydroelectric power.*



In less than a decade, Alaska has earned a reputation as America's energy storehouse.

With the Trans-Alaska Pipeline delivering crude oil from North America's largest known petroleum reservoir, and with a route chosen for a natural gas pipeline extending 4,800 miles to the midwest and west coast, Alaska has become a crucial supplier of American-produced petroleum.

Prudhoe Bay contains almost 30 percent of America's proven reserves of oil. And during the coming years, this field will provide some 10 percent of the oil used per annum in the United States.

Alaska's huge coal reserves add to the "energy storehouse" reputation. The U.S. Geological Survey has estimated Alaska's coal resources at over 130 billion short tons. By comparison, demonstrated coal resources in the lower 48 states total 437 billion short tons.

Important, however, as these resources are for the nation, Alaska's own energy future lies largely with yet another energy source, one that is cleaner, more reliable and ultimately cheaper than fossil fuels—hydroelectric power.

Alaska possesses hydroelectric potential in an abundance as great as that of its fossil fuels. A third of the freshwater runoff of the entire nation is found in Alaska, and the Alaska Power Administration has estimated the state's hydroelectric potential at as much as 172 billion kilowatt hours per year. Hydro-generated electricity in the United States in 1975 totalled 304 billion kilowatt hours.



Senator Mike Gravel, D-Alaska, is serving his second term in the U.S. Senate. He is a member of the Finance Committee, and chairman of its subcommittee on energy; he is also a member of the Environment and Public Works Committee, and chairs its subcommittee on water resources.



This 2300-foot-long bridge across the Yukon River was built to carry heavy traffic for the trans Alaska pipeline project.

Hydroelectric power can be provided to most of Alaska's population, both in the high-demand "railbelt" area which includes Anchorage and Fairbanks, and in the smaller, isolated cities of southeast Alaska. Even where it can't provide power directly, as in the remote interior villages, hydroelectric development can help lower electricity costs through a statewide power authority.

It is not surprising that, among all its energy riches, Alaska should choose the one which constitutes a renewable resource. In fact, the choice can be seen as part of a widespread preference for a renewable recourse economy in Alaska.

The effects of unplanned development in the Lower, and of the ever-increasing burning of fossil fuels, have become well known while Alaska is still mostly wilderness. Indeed, many Alaskans came north to escape the worst of twentieth century growth and pollution.

Alaska's opportunity to plan a different and better future for itself is unprecedented. Three factors work to

the state's advantage: 1) a huge undeveloped land mass that is soon to undergo extensive changes of ownership; 2) a politically active populace; and, 3) coincidental with the land transfers, a massive infusion of oil dollars.

Wilderness Nature Of Alaska

The true wilderness nature of much of the state is not appreciated by most who have not witnessed it. There are, for example, less than 3,000 miles of paved highway in all of Alaska's 586,000 square miles.

At present, the federal government owns more than 90 percent of this expanse of 365 million acres. But a great redistribution of the land is imminent. Some 104 million acres will pass to state ownership under the terms of the Alaska Statehood Act, and 44 million more acres will go into the private ownership of the Alaska Native corporations which were created by the Alaska Native Claims Settlement Act.

These sudden extensive changes in land ownership create a climate that is conducive to land use planning. And in fact, a Joint Federal-State Land Use Planning Commission already exists in Alaska. The Commission is now dealing with proposals to redesignate as much as half the remaining federally-owned acreage as parks, forests and refuges.

But the life of the Commission could well be extended beyond this task, and it could—and, I believe, should—act as a statewide land use planner. No other state has had this opportunity to put land use planning into effect virtually from the beginning of land development.

The degree of participatory democracy in Alaska is also noteworthy. Alaskans as a group are well educated and politically aware, and they are accustomed to making their voices heard.

A recent case in point is the state's Public Forum. Under this program of meetings and polls, the state government sought out Alaskans' desires for the future. Overwhelmingly, citizens identified the issue of growth as a controversial one, and they said they preferred a state economy based on renewable resources.

The final factor in making Alaska's opportunity unique is its sudden, near-overwhelming influx of money from petroleum development. With the oil pipeline on-stream, Alaska can look forward to income approaching \$1 billion per year from current oil production alone. North Slope gas will add more when the gas pipeline is in place. And several other areas of the state, both on- and off-shore, are considered to be among the most promising in the country for new oil discoveries.

Use Of Petroleum-Generated Income

It seems ironic that income from non-renewable petroleum should provide the key to a renewable resource future in Alaska—and even more ironic insofar as oil income can help make renewable energy, through hydropower, a reality.

In fact, Alaskans' insistence on turning their oil income into a self-renewing and self-sustaining economic base is the product of a hard lesson that the state learned in the first years of the North Slope bonanza.

After the discovery of oil at Prudhoe Bay, the state conducted a sale of oil leases in 1969 which yielded \$900 million. This represented a huge windfall, almost five times the size of that year's state budget.

Alaska, which had never been able to afford the kinds of social programs it needed, used much of the \$900 million to expand education, health care and public works programs. All state programs, in fact, were expanded. But the lease money could not sustain these programs beyond a few years, and when the pipeline and its income were delayed, the state found itself running a \$200 million yearly deficit.

The virtual disappearance of the \$900 million made a deep impression on Alaskans, and they became commit-

ted to using future oil income to help build a self-sustaining economic foundation based on renewable resource industries.

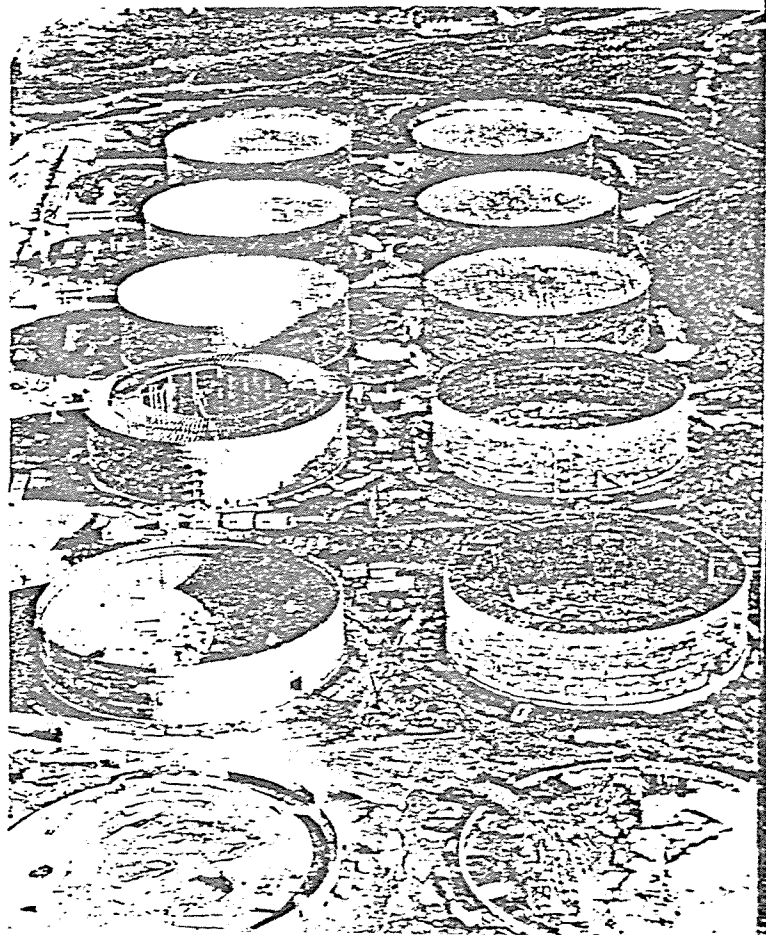
State Permanent Fund

Voters in 1976 passed a constitutional amendment creating a state Permanent Fund, an economic "nest egg" built from oil income. At least 25 percent of the income from oil and other non-renewable resources must be set aside in the fund. The principal must be put in income-producing investments, including loans to Alaska industry. Interest may be spent or retained. State officials have researched other such permanent funds in Alberta, New Mexico, Kuwait and Venezuela—in addition to the Japan Development Bank—for guidance on investment of the Alaska fund.

Income to the Alaska fund is estimated at \$1.3 billion by 1985 if only the 25 percent minimum is invested—or as much as \$5 billion if 100 percent were invested. In addition, the Alaska Renewable Resources Fund, established by the state legislature in 1974, takes effect this July. Five percent of the money Alaska collects from non-renewable resources must be set aside in this fund to develop renewable resource industries.

It is in this context, then, that Alaska is looking to its hydroelectric potential as a renewable base for its energy needs.

These 62-foot-high crude oil storage tanks, shown here while still under construction, are at the Valdez terminal for the trans Alaska pipeline.





Although not specifically designated as animal crossings, some elevated portions of the trans Alaska pipeline provide adequate clearance for passage of large migrating or roaming animals. There are about 360 such sites along the 800-mile line.

In Southeast Alaska, 40 percent of electricity needs already are met by hydro-power. But in Anchorage, where demand is largest, natural gas is being burned to generate power; and in Fairbanks, the basic fuel for electricity is coal.

More than half the hydroelectric potential remaining in the U.S. is to be found in Alaska. Many potential sites are in the southeast, and new small hydro developments can be added to serve the small cities there. The most dramatic hydro-power potential, however, is on the Susitna River about halfway between Anchorage and Fairbanks.

This site has been referred to by environmentalists as the best in the state for a large hydro project. The Susitna's water is glacial, meaning there is no fish life to be affected. The project would involve inundation of a minimum amount of land and thus minimal interference with wildlife, especially at the deep gorge called Devils Canyon.

The project would involve constructing two dams, one at Devils Canyon and one upriver from the canyon. The combined capacity of the two dams would be 1,568 megawatts. Together, they would generate an average 6.91 billion kilowatt hours per year, which is more than 60 percent of the power needs projected for the railbelt area. As in all hydroelectric projects, the estimated \$1.5 billion cost for the Susitna project would be almost entirely for the initial dam construction, leaving the power that is produced free from inflationary pressures.

Under the Alaska Hydroelectric Power Development Act, which passed Congress in 1976, a new method of financing would be used to build the Susitna dams. In essence, the state would pay the U.S. Corps of Engineers, as contractors, through the sale of bonds—meaning that unlike many large water projects, this one would be paid

for and owned by the same people who would benefit from it.

Phase I Activities—Susitna Dams

At present, the Corps is at the proposed sites conducting Phase I activities, which include complete design and cost/benefit analyses as well as a final Environmental Impact Statement. If these result in a go-ahead decision for the project, the first dam could be on line by 1986 and the second by 1990.

Among those who were quick to recognize Alaska's great hydro-power potential was the late Senator Hubert Humphrey, who said during a visit to the state 18 years ago that hydro-power was "one of the greatest of all Alaska resources—this power is a vital and essential requirement for the development of Alaska as a whole, and most of her resources." I have proposed naming the Susitna project for Senator Humphrey and the state legislature is already acting on the proposal.

Alaskans are anxious to build an economy that will enhance rather than degrade the environment of the nation's most spectacular state.

Reaching this and other objectives will be aided by the great shifts in land ownership and land management in Alaska which are creating a climate conducive to unprecedented land use planning, and Alaskans can be relied upon to participate vigorously in the planning process.

As mentioned before, it is somewhat ironic that the key to using these unusual assets and to avoiding the mistakes that others have made is being given to Alaskans in the form of great infusions of money generated from non-renewable oil. This money can be used to build a capital infrastructure geared toward renewable resource industries. And among the features of such an infrastructure is an energy base of hydroelectric power. ■

ALASKA

GC
Grant
to
Skoog

United States Senate
WASHINGTON, D.C. 20510

October 11, 1978

ESTES ✓
COMMISSIONER'S OFFICE
RECEIVED
NOV 6 1978

DEPARTMENT OF Fish and Game

Ron Skoog
Commissioner
Alaska Department of Fish and Game
Subport Building
Juneau, Alaska 99801

Dear Ron:

REGIONAL OFFICE

I just received your letter relative to my article which appeared in Catalyst magazine and appreciate your critique of my remarks on the Susitna dam project.

I particularly appreciated your synopsis of the projected impact the hydroelectric facility may have on the Susitna river fishery and the need for further study of the situation before full construction can get underway.

In that regard I must be advised on three matters. First, how much money is required to conduct the required fishery impact study in the upper and lower Susitna River drainages. Second, of the total amount of money that is needed, what is the break down on amounts and sources from which it can be obtained? Specifically, how much can be made available for such a study from ADF & G, how much can be counted on from National Marine Fisheries Service, and finally how much must come from the Corp of Engineers.

Third, what is the time frame involved in this type of fishery impact study? Can you give me an idea of how extensive this type of study is, what it entails and, most importantly, how much time it will require?

If you can provide me answers to these questions at your earliest possible convenience, it will enable us to do what we can to ensure the appropriate study of the impact

RECEIVED
NOV 7 1978

ALASKA

United States Senate

WASHINGTON, D.C. 20510

COMMISSIONER'S OFFICE

RECEIVED

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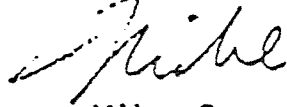
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Page Two

on the Susitna fishery is carried out while at the same time ensuring that work on the Susitna project is not unduly delayed.

With best wishes.

Sincerely,

A handwritten signature in cursive script, appearing to read "Mike Gravel".

Mike Gravel

NG:tr

COE

Skog
to

Gravel

Response

ESTES

December 14, 1978

ALASKA DEPT. OF
FISH & GAME

DEC 20 1978

SPOON RIVER DIVISION
REGIONAL OFFICE

The Honorable Mike Gravel
United States Senate
3121 Dirksen Senate Office Bldg.
Washington, D.C. 20510

Re: Susitna Hydro Project

Dear Senator Gravel:

Thank you for your letter of October 11 requesting further information on the budgets required for fisheries investigations relative to the Susitna Hydro Project. Although you requested information related only to fisheries, I would like to take this opportunity to familiarize you with all of the biological investigations and inform you of our concerns regarding these fish and wildlife studies.

You asked: "How much money is required to conduct the required fishery impact study in the Upper and Lower Susitna River drainages?" Enclosed are the pages of the June 1978 Phase I Plan of Study (POS) prepared by the Corps of Engineers (Attachment 1) which address all proposed biological investigations. The information contained in these pages outlines the proposed biological studies which should be a part of work performed to aid in the determination of the feasibility of this Susitna Hydro Project. Studies B-2 through B-7 are required to assess the impact of the proposed project on the Susitna River's fisheries resources. Using the Corps projected cost the fisheries portion of these studies would amount to \$2,264,000. The Department estimates that \$5,158,000 would be required to adequately perform these studies.

Secondly, you requested: "Of the total amount of money that is needed, what is the breakdown on amounts and sources from which it can be obtained? Specifically how much can be made available for such a study from ADF&G, how much can be counted on from National Marine Fisheries Service, and finally,

ESTES

December 14, 1978

ALASKA DEPT. OF
FISH & GAME

DEC 20 1978

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United States Senate
3121 Dirksen Senate Office Bldg.
Washington, D.C. 20510

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how much must come from the Corps of Engineers?" The table in Attachment 2 shows the Phase I budgets proposed by the Corps (4.3 million dollars) and by the Department (7.9 million dollars) and the differences between the budgets in dollars and percent. As you will note, there is a 3.6 million dollar difference between the Corps and ADF&G budget proposals. A recent letter to Eric Yould, Executive Director of the Alaska Power Authority (Attachment 3), further expresses our concerns of the inadequacy of funding for the Phase I biological investigations.

We believe the money for the Phase I investigations should come from the federal government through the Corps of Engineers or through State appropriations for the full term (46 months) of the proposed studies. Funding may be available this year if the State of Alaska appropriates between 7 and 8 million dollars to initiate the first year of Phase I studies. However, there is no assurance that the remainder of the investigations will be funded.

This Department does not have the funds to divert into the study of the Susitna Hydro Project. Diversion of Federal Aid in Wildlife Restoration (P-R) or Federal Aid in Fisheries Restoration (D-J) funds and projects to study fish and wildlife impacts would result in sport hunters and fishermen subsidizing investigations of a project affecting not only these user groups but the broad spectrum of the public. Also, all of the Department's D-J and P-R funds are currently dedicated to ongoing studies.

The third question you asked: "What is the time frame involved in this type of fishery impact study?" is critical to our success in maintaining the fishery. As we stated in the attached letter to the APA, we believe a strong indication of the feasibility of this project with respect to fish and wildlife can be stated if the proposed Phase I studies in the POS are carried out. There are effectively three full field years possible in the 46 month Phase I time frame. The time frames are basically laid out in the enclosed biological investigations section of the POS (Attachment 1, pages 229-302). All salmon species have in excess of two year life cycles and certain studies, to accommodate the investigation of species with life cycles up to five years, should be extended beyond that three years to a full five year time frame. Earlier proposals by this Department for five years of study would have cost ten million dollars. Until the feasibility investigations are complete and the potential fish and wildlife impacts identified, projection on time and cost of fish and wildlife mitigation studies are not presently possible.

I hope that the material enclosed, and our discussion will point out that alternatives for providing the budgets for biological investigations must be explored. We seek your assistance in determining if the Susitna Hydro Project is feasible from a biological standpoint. If the decision is made

Mike Gravel

-3-

December 14, 1973

to proceed with construction, we also seek your assistance in seeing that the project is done in a manner which mitigates fish and wildlife resource losses. Please contact this Department if you need more information.

Sincerely,

Ronald O. Skoog
Commissioner

Attachments (4)

cc: R. Logan
T. Trent

ROS:EL:er

CE

