

# LOW IMPACT HYDROPOWER INSTITUTE

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[www.lowimpacthydro.org](http://www.lowimpacthydro.org)

## LOW IMPACT HYDROPOWER QUESTIONNAIRE

[Excerpted from Part VI, Section E of the Low Impact Hydropower Certification Program. Words in italics are defined in Part VI, Section C, and line-by-line instructions are available in Section D of the program, available on-line in PDF format at <http://www.lowimpacthydro.org>.

### E. LOW IMPACT HYDROPOWER QUESTIONNAIRE

Background Information	
1) Name of the <i>Facility</i> .	GOAT LAKE HYDRO
2) Applicant's name, contact information and relationship to the Facility. If the Applicant is not the Facility owner/operator, also provide the name and contact information for the Facility owner and operator.	ALASKA POWER & TELEPHONE CO. 193 OTTO STREET P.O. BOX 3222 PORT TOWNSEND, WA 98368
3) Location of Facility by river and state.	GOAT LAKE, 7 MILES NORTH OF SKAGWAY, AK
4) Installed capacity.	4.0 MW
5) Average annual generation.	12,701,000 KWH
6) Regulatory status.	FERC LICENSE NO. P-11077; LICENSED 1996
7) Reservoir volume and surface area measured at the high water mark in an average water	5,460 ACRE FEET; 204 SURFACE ACRES

year.	
8) Area occupied by non-reservoir facilities (e.g., dam, penstocks, powerhouse).	25.18
9) Number of acres inundated by the Facility.	204 SURFACE ACRES; RESERVOIR IS AN ALPINE LAKE
10) Number of acres contained in a 200-foot zone extending around entire impoundment.	92 ACRES
11) Please attach a list of contacts in the relevant Resource Agencies and in non-governmental organizations that have been involved in Recommending conditions for your Facility.	SEE ATTACHMENT
12) Please attach a description of the Facility, its mode of operation (i.e., peaking/run of river) and a map of the Facility.	SEE ATTACHMENT
<b>Questions for For “New” Facilities Only:</b>  If the Facility you are applying for is “new” i.e., an existing dam that added or increased power generation capacity after August of 1998 please answer the following questions to determine eligibility for the program	
13) When was the dam associated with the Facility completed?	
14) When did the added or increased generation first generate electricity? If the added or increased generation is not yet operational, please answer question 18 as well.	
15) Did the added or increased power generation capacity require or include any new dam or other diversion structure?	
16) Did the added or increased capacity include or require a change in water flow through the facility that worsened conditions for fish, wildlife, or water quality, (for example, did operations change from run-of-river to peaking)?	

17 (a) Was the existing dam recommended for removal or decommissioning by resource agencies, or recommended for removal or decommissioning by a broad representation of interested persons and organizations in the local and/or regional community prior to the added or increased capacity?		
(b) If you answered “yes” to question 17(a), the Facility is not eligible for certification, unless you can show that the added or increased capacity resulted in specific measures to improve fish, wildlife, or water quality protection at the existing dam. If such measures were a result, please explain.		
18 (a) If the increased or added generation is not yet operational, has the increased or added generation received regulatory authorization (e.g., approval by the Federal Energy Regulatory Commission)? If not, the facility is not eligible for consideration; and (b) Are there any pending appeals or litigation regarding that authorization? If so, the facility is not eligible for consideration.		
<b>A. Flows</b>	<b>PASS</b>	<b>FAIL</b>
1) Is the Facility in <i>Compliance</i> with <i>Resource Agency Recommendations</i> issued after December 31, 1986 regarding flow conditions for fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations) for both the reach below the tailrace and all bypassed reaches?	YES = Pass, Go to B N/A = Go to A2 FLOWS ARE ONLY RELEASED FOR SCENIC VALUE IN THE BYPASS REACH, NOT FOR FISH	NO = Fail
2) If there is no flow condition recommended by any Resource Agency for the Facility, or if the recommendation was issued prior to January 1, 1987, is the Facility in Compliance with a flow release schedule, both below the tailrace and in all bypassed reaches, that at a minimum meets Aquatic Base Flow standards or “good” habitat flow standards calculated using the Montana-Tennant method?	YES = Pass, go to B NO = Go to A3	
3) If the Facility is unable to meet the flow standards in A.2., has the Applicant demonstrated, and obtained a letter from the relevant Resource Agency confirming that demonstration, that the flow conditions at the Facility are appropriately	YES = Pass, go to B	NO = Fail

protective of fish, wildlife, and water quality?		
<b>B. Water Quality</b>	PASS	FAIL
1) Is the Facility either:  a) In Compliance with all conditions issued pursuant to a Clean Water Act Section 401 water quality certification issued for the Facility after December 31, 1986? Or  b) In Compliance with the quantitative water quality standards established by the state that support designated uses pursuant to the federal Clean Water Act in the Facility area and in the downstream reach?	YES = Go to B2  YES, 401 CERTIFICATION ATTACHED	NO = Fail
2) Is the Facility area or the downstream reach currently identified by the state as not meeting water quality standards (including narrative and numeric criteria and designated uses) pursuant to Section 303(d) of the Clean Water Act?	YES = Go to B3 NO = Pass  NO	
3) If the answer to question B.2 is yes, has there been a determination that the Facility is not a cause of that violation?	YES = Pass	NO = Fail
<b>C. Fish Passage and Protection</b>	PASS	FAIL
1) Is the Facility in Compliance with <i>Mandatory Fish Passage Prescriptions</i> for upstream and downstream passage of anadromous and catadromous fish issued by Resource Agencies after December 31, 1986?	YES = Go to C5 N/A = Go to C2  N/A	NO = Fail
2) Are there historic records of anadromous and/or catadromous fish movement through the Facility area, but anadromous and/or catadromous fish do not presently move through the Facility area ( <i>e.g.</i> , because passage is blocked at a downstream dam or the fish run is extinct)?  a) If the fish are extinct or extirpated from the Facility area or downstream reach, has the Applicant demonstrated that the extinction or extirpation was not due in whole or part to the Facility?	YES = Go to C2a NO = Go to C3  NO  YES = Go to C2b N/A = Go to C2b	NO = Fail

<p>b) If a Resource Agency Recommended adoption of upstream and/or downstream fish passage measures at a specific future date, or when a triggering event occurs (such as completion of passage through a downstream obstruction or the completion of a specified process), has the Facility owner/operator made a legally enforceable commitment to provide such passage?</p>	<p>YES = Go to C5 N/A = Go to C3</p>	<p>NO = Fail</p>
<p>3) If, since December 31, 1986:</p> <p>a) Resource Agencies have had the opportunity to issue, and considered issuing, a Mandatory Fish Passage Prescription for upstream and/or downstream passage of anadromous or catadromous fish (including delayed installation as described in C2a above), and</p> <p>b) The Resource Agencies declined to issue a Mandatory Fish Passage Prescription,</p> <p>c) Was a reason for the Resource Agencies' declining to issue a Mandatory Fish Passage Prescription one of the following: (1) the technological infeasibility of passage, (2) the absence of habitat upstream of the Facility due at least in part to inundation by the Facility impoundment, or (3) the anadromous or catadromous fish are no longer present in the Facility area and/or downstream reach due in whole or part to the presence of the Facility?</p>	<p>NO = Go to C5 N/A = Go to C4</p> <p>N/A; NONE WAS ISSUED BECAUSE THERE ARE NO FISH IN THE SKAGWAY RIVER EXCEPT SEVERAL MILES BELOW THE PROJECT TAILRACE WHERE THERE IS AN ANADROMOUS BARRIER</p>	<p>YES = Fail</p>
<p>4) If C3 was not applicable:</p> <p>a) Are upstream and downstream fish passage survival rates for anadromous and catadromous fish at the dam each documented at greater than 95% over 80% of the run using a generally accepted monitoring methodology? Or</p> <p>b) If the Facility is unable to meet the fish passage standards in 4.a., has the Applicant demonstrated, and obtained a letter from the US Fish and Wildlife Service or National Marine Fisheries Service confirming that demonstration, that the upstream and downstream fish passage measures (if any) at the Facility are appropriately protective of the fishery resource?</p>	<p>YES = Go to C5 N/A; AS IN C3, NO FISH ARE IN PORTION OF RIVER PROJECT DISCHARGES INTO BECAUSE OF AN ANADROMOUS BARRIER WELL BELOW THE PROJECT</p>	<p>NO = Fail</p>

5) Is the Facility in Compliance with Mandatory Fish Passage Prescriptions for upstream and/or downstream passage of <i>Riverine</i> fish?	YES = Go to C6 N/A = Go to C6      N/A	NO = Fail
6) Is the Facility in Compliance with Resource Agency Recommendations for Riverine, anadromous and catadromous fish entrainment protection, such as tailrace barriers?	YES = Pass, go to D N/A = Pass, go to D      N/A	NO = Fail
<b>D. Watershed Protection</b>	PASS	FAIL
1 ) Is there a buffer zone dedicated for conservation purposes (to protect fish and wildlife habitat, water quality, aesthetics and/or low-impact recreation) extending 200 feet from the high water mark in an average water year around 50 - 100% of the impoundment, and for all of the undeveloped shoreline	YES = Pass, go to E and receive 3 extra years of certification	NO = go to D2 NO; PROJECT IS WITHIN USFS LANDS AND IS REMOTE
2 ) Has the facility owner/operator established an approved watershed enhancement fund that: 1) could achieve within the project's watershed the ecological and recreational equivalent of land protection in D.1., and 2) has the agreement of appropriate stakeholders and state and federal resource agencies?	YES = Pass, go to E and receive 3 extra years of certification	NO = go to D3  NO
3 ) Has the facility owner/operator established through a settlement agreement with appropriate stakeholders and that has state and federal resource agencies agreement an appropriate shoreland buffer or equivalent watershed land protection plan for conservation purposes (to protect fish and wildlife habitat, water quality, aesthetics and/or low impact recreation)	YES = Pass, go to E	NO = go to D4  NO
4 ) Is the facility in compliance with both state and federal resource agencies recommendations in a license approved shoreland management plan regarding protection, mitigation or enhancement of shorelands surrounding the project.	YES = Pass, go to E NO SHORELINE MANAGEMENT PLAN RECOMMENDED	No = Fail
<b>E. Threatened and Endangered Species Protection</b>	PASS	FAIL
1) Are threatened or endangered species listed under state or federal Endangered Species Acts present in the Facility area and/or downstream reach?	YES = Go to E2 NO = Pass, go to F      NO	
2) If a recovery plan has been adopted for the threatened or endangered species pursuant to Section 4(f) of the Endangered Species Act or similar state provision,	YES = Go to E3	NO = Fail

is the Facility in Compliance with all recommendations in the plan relevant to the Facility?	N/A = Go to E3	
3) If the Facility has received authority to incidentally <i>Take</i> a listed species through: (i) Having a relevant agency complete consultation pursuant to ESA Section 7 resulting in a biological opinion, a habitat recovery plan, and/or (if needed) an incidental Take statement; (ii) Obtaining an incidental Take permit pursuant to ESA Section 10; or (iii) For species listed by a state and not by the federal government, obtaining authority pursuant to similar state procedures; is the Facility in Compliance with conditions pursuant to that authority?	YES = Go to E4 N/A = Go to E5	NO = Fail
4) If a biological opinion applicable to the Facility for the threatened or endangered species has been issued, can the Applicant demonstrate that:  a) The biological opinion was accompanied by a FERC license or exemption or a habitat conservation plan? Or  b) The biological opinion was issued pursuant to or consistent with a recovery plan for the endangered or threatened species? Or  c) There is no recovery plan for the threatened or endangered species under active development by the relevant Resource Agency? Or  d) The recovery plan under active development will have no material effect on the Facility's operations?	YES = Pass, go to F	NO = Fail
5) If E.2. and E.3. are not applicable, has the Applicant demonstrated that the Facility and Facility operations do not negatively affect listed species?	YES = Pass, go to F	NO = Fail
<b>F. Cultural Resource Protection</b>	PASS	FAIL
1) If FERC-regulated, is the Facility in Compliance with all requirements regarding Cultural Resource protection, mitigation or enhancement included in the FERC license or exemption?	YES = Pass, go to G N/A = Go to F2                      YES	NO = Fail

2) If not FERC-regulated, does the Facility owner/operator have in place (and is in Compliance with) a plan for the protection, mitigation or enhancement of impacts to Cultural Resources approved by the relevant state or federal agency or <i>Native American Tribe</i> , or a letter from a senior officer of the relevant agency or Tribe that no plan is needed because Cultural Resources are not negatively affected by the Facility?	YES = Pass, go to G	NO = Fail
<b>G. Recreation</b>	PASS	FAIL
1) If FERC-regulated, is the Facility in Compliance with the recreational access, accommodation (including recreational flow releases) and facilities conditions in its FERC license or exemption?	YES = Go to G3 N/A = Go to G2      YES	NO = Fail
2) If not FERC-regulated, does the Facility provide recreational access, accommodation (including recreational flow releases) and facilities, as Recommended by Resource Agencies or other agencies responsible for recreation?	YES = Go to G3	NO = Fail
3) Does the Facility allow access to the reservoir and downstream reaches without fees or charges?	YES = Pass, go to H      YES	NO = Fail
<b>H. Facilities Recommended for Removal</b>	PASS	FAIL
1) Is there a Resource Agency Recommendation for removal of the dam associated with the Facility?	NO = Pass, Facility is Low Impact      NO	YES = Fail



## PROJECT DESCRIPTION

### LOCATION

The Goat Lake Hydroelectric Project is located approximately 6.5 miles northeast of Skagway, Alaska. The lake is situated in a perched cirque valley at El 2925. The lake lies east and south of the Skagway River. The drainage basin for Goat Lake and Pitchfork Falls Creek includes 4.2 square-miles. The lake is fed by a glacier at its south end. The glacier covers about 1.7 square miles, contributing approximately 80-85% of its runoff to the lake. The glacier terminates near the south end of the lake in a coarse rubble moraine, consisting principally of large angular granitic blocks. The lake outlet, located about 300 feet north of the end of the moraine, flows through a bedrock notch and contributes the major portion of the water flow in Pitchfork Falls. After the falls this same water then joins the Skagway River.

### PROJECT DESCRIPTION

The Goat Lake Hydroelectric Project is a storage project with a 4.0 MW capacity that is usually block loaded, but sometimes operated as load following. The lake is used as a reservoir without any dam. The lake continues to have an uncontrolled spillway using the original outlet. A siphon intake extends into the lake a horizontal distance of 369-feet to obtain 185-feet of submergence, or an elevation of 2740, potentially drawing the lake down to the approximate elevation 2885 at peak use, during the winter. The intake, consisting of a v-shaped wedgewire screen assembly, is connected to the siphon pump by a 30-inch-diameter high density polyethylene chloride (HDPE) penstock which changes to a 28-inch-diameter steel penstock approximately 82-feet before the siphon house. The siphon pump connects with a valve house via a 704-foot-long, 30-inch-diameter HDPE penstock. A catchbasin located at approximately 2,885-feet above mean sea level (msl) catches runoff from the glacier moraine that bypasses the lake. The catchbasin is connected to a pumpback house via an 18-inch-diameter HDPE penstock. The pumpback house draws water from the catchbasin and pumps the water back to the lake via a 16-inch-diameter, 640-foot-long HDPE penstock by using four pumps of various horsepower (HP). The valve house also has a 16-inch bypass flow pipe for when additional water is needed in Pitchfork Falls Creek at certain times of the year. A minimum of 8.5 cfs is required for visual concerns from May 15 – September 30 for 12 hours each day. This is operated via a SCADA system that measures flows and releases or stops releases when required. The valve house also has a 28-inch-diameter HDPE penstock to approximately the 2,610 foot elevation where the penstock transitions to a 24-inch-diameter steel pipe to the powerhouse. At the 990-foot elevation the penstock crosses under the historic White Pass & Yukon Route Railroad (WP&YR-RR) via an approximately 40-foot-long pipe conduit. At the 777-foot elevation the penstock passes through a 48-inch-diameter pipe conduit over the Skagway River, to the west bank, to the powerhouse, at 769-feet above msl.

The powerhouse contains one horizontal shaft Pelton turbine and associated 4.0 MW synchronous generator for a total installed capacity of 4.0 MW. A tailrace transports the turbine discharge approximately 70 feet to the Skagway River. A small substation is located adjacent to the powerhouse. A pole mounted 34.5 kV transmission line begins at the substation and parallels the Skagway River, following the west side for approximately 4,538 feet to a point across from Clifton and ascends to the distribution line from Skagway serving the U.S. Custom's Border Station on the Klondike Highway.

## ENVIRONMENT

The lake was stocked with grayling in 1994 by the Alaska Department of Fish & Game, the same year we filed a license application to the Federal Energy Regulatory Commission. After conducting a population survey in 2001-2002 we are currently monitoring the graylings access to their spawning stream to determine if the lake drawdown exposes any barriers to their movement into the stream to spawn. This (2005) is the third year of the five year study. To this point grayling have been observed in the spawning stream every year, indicating there is not a barrier to their movement when the lake is drawn down. Anadromous fish do not get closer than several miles downstream of the project tailrace due to a barrier falls. The penstock offers adequate measures to allow wildlife to move over or under it along its length. No species were considered to be impacted by the construction and operation of this project.

**TABLE 2**  
**SUMMARY OF PROJECT FEATURES**

Name of Project	Goat Lake Hydroelectric Project, FERC Project No. 11077	
Project Location	Sections 10, 11, 14, 15, and 16; T27S, R60E, CRM. 6.5 miles Northeast of Skagway, Alaska; located in Southeast Alaska. Approximate latitude 59 degrees, 32' and longitude 135 degrees 11'.	
Intake	Submerged wedge wire screen at elevation 2740.	
Reservoir	Name:	Goat Lake
	Surface Elevation:	2925 (elevation as referenced in Commission correspondence of March 28, 1997)
	Surface Area:	204 Acres
	Storage Capacity:	
	Net:	5460 Acre Feet
	Operation:	The net storage will be utilized by siphoning the reservoir down 40 feet to a minimum elevation of 2885.
Siphon	418-foot-long, 30-inch-diameter HDPE penstock and 82-foot-long, 28-inch-diameter Steel penstock with a vacuum pump assembly.	
Catchbasin	8-foot-high by 37-foot-long concrete retaining wall at approximate elevation 2885; impounds 0.014 acre-feet of water.	
Pumpback House	Pump assembly to pump moraine flows back to the lake for regulated storage. 8-foot by 40-foot building will house four pumps of various horsepower. A 640-foot-long by 16-inch-diameter HDPE pipe extends from the pump house to Goat Lake.	
Valve House	8-foot by 20-foot valve house connected with the siphon via a 30-inch-diameter HDPE penstock.	
Penstock	Total Length:	6578 feet
	Diameter and Type:	30-inch HDPE for 704 feet 28-inch HDPE for 959 feet 24-inch Steel for 4,915 feet
Powerhouse	Size:	36-foot by 48-foot by 24 feet high
	Number of Units:	One
	Type of Turbine:	Horizontal Twin-Jet Pelton
	Turbine Rating:	6000 HP
	Flow:	32 cfs
	Head:	
	Gross:	2149
	Friction Loss: 94	Net: 2055
	Power:	6000 HP
	Generator Rating:	4 Megawatts
	Voltage:	4.16 kV
Distribution Line	Voltage:	34.5 kV
	Length:	4,538 feet
	Type:	Overhead on wooden poles
Access	Road from Klondike Highway to the powerhouse	
	Length:	2,990 feet
	Width:	30 feet
Average Annual Energy Production	12,701,000 KWH	

## **FINAL GOAT LAKE HYDRO PROJECT 5-YEAR GRAYLING MONITORING PLAN**

### Article 409

The licensee shall file with the Commission, for approval, a plan to monitor the lake elevations, inlet stream temperatures, and grayling recruitment for the first 5 years of operation at the authorized 40-foot drawdown (elevation 2, 885 feet mean sea level). The purpose of the plan is to determine if fish passage measures are necessary for providing access for grayling to the inlet stream to Goat Lake.

### Plan

- Monitoring of lake elevation is continuously recorded throughout a 24 hour period, 365 days per year.
- A temperature gauge will be installed in the inlet stream, above the normal lake elevation, each spring (May-June) after ice is off of the stream.
- Starting in late June, observations of grayling in the inlet stream, above high water (a full lake), will be made. Once one fish is observed in the inlet stream above high water, observations may cease as the purpose of the monitoring is to determine if they are making it to the inlet stream, or not. Some form of record, i.e. photography or video, will be used to document that a fish has reached the inlet stream spawning area. Observations will also be made to see if any obstructions have developed, or potentially developed, in the inlet stream alluvial channel.
- By October 1, each year of the 5-year monitoring program, a report of the lake elevation correlated with inlet stream temperature and fish observation will be made to USF&WS, USFS, and ADF&G for a 45 day review.
- By the end of each year, of the 5-year monitoring program, the results of the monitoring with agency comments and recommendations will be submitted to the Commission.
- If logistical problems, such as weather or scheduling, prevent the licensee from observing grayling in the inlet stream, the lake will be sampled for young-of-the-year the following spring.
- If fish are not observed on any given year despite field trips to conduct the survey, or if fish passage barriers are observed along with no observations of fish, the licensee shall file with the Commission a fish passage restoration plan developed in consultation with the agencies listed above. This plan shall be filed with the Commission, for approval, within 1 year from when the fish migration problem is identified. Documentation of agency consultation, including recommendations and specific descriptions of how the agencies' comments are accommodated by the plan will be included with the plan.

# STATE OF ALASKA

## DEPARTMENT OF FISH AND GAME

### HABITAT AND RESTORATION DIVISION SOUTHEAST REGIONAL OFFICE

**FRANK H. MURKOWSKI, GOVERNOR**

802 3<sup>rd</sup> street  
P.O. Box 240020  
Douglas Alaska 99824-0020  
Phone 907-465-4289  
Fax 907-465-4215

April 8, 2003

Mr. Glen D. Martin  
Goat Lake Hydro, Inc.  
P.O. Box 222  
191 Otto Street  
Port Townsend, WA 98368

Dear Mr. Martin:

Re: Goat Lake Hydroelectric Project, FERC Project No. 11077

The Alaska Department of Fish and Game (ADF&G) has reviewed Goat Lake Hydro, Inc.'s (GLHI) March 10, 2003, proposed 5-year grayling monitoring plan. This plan was required pursuant to a February 7, 2003, amendment to the Federal Energy Regulatory Commission (FERC) license for the project (FERC No. 11077). The license amendment allows GLHI to fluctuate Goat Lake stage between elevations 2,925 feet and 2,885 feet mean sea level, a 10-foot greater lake drawdown than previously permitted. We offer the following comments on the draft plan.

Except for the following condition, the proposed plan is consistent with FERC's February 7, 2003, license amendment and conditions recommended by ADF&G, which are contained in the January 24, 2003, supplemental clarification to the final Alaska Coastal Management Program consistency determination.

"If logistical problems, such as weather or scheduling, prevent the licensee from observing grayling in the inlet stream, the lake will be sampled for young-of-the-year fish the following spring."

We recommend that this condition and contingency procedures for its implementation be included in the Goat Lake monitoring plan. Additionally, please provide copies of the annual reports to the Northern Southeast Area Sport Fish Biologist.

Mr. Glenn Martin  
April 8, 2003

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Goat I Hydroelectric Project  
FERC No. 11077

Randy Ericksen  
Alaska Department of Fish and Game  
Division of Sport Fish  
Mile 1 Haines Highway  
P.O. Box 330  
Haines, Alaska 99827-0330

If you have questions please call Kevin Brownlee (907-465-4276) or the Area Sport Fish Biologist in Haines, Randy Ericksen at 907-766-3638.

Sincerely,



Clayton Hawkes  
Hydro-Project Review Coordinator

cc: B. Hanson, H&R-Douglas \*  
R. Holmes, SF-Douglas \*  
C. Estes, SF-RTS-Anchorage \*  
B. Kirkpatrick, H&R-Douglas \*  
J. Klein, SF-RTS-Anchorage \*  
K. Brownlee, SF-RTS-Douglas \*  
R. Ericksen, SF-Haines \*  
L. Marshall, DGC \*  
J. Dunker, DNR \*  
Secretary Salas, FERC-Washington, D.C.  
M. Henry, FERC Portland  
D. Martin, USFS-Juneau \*  
S. Brockmann, USFWS-Juneau  
R. Enriquez, USFWS-Juneau  
S. Selmer, AP&T

\* e-mail



A subsidiary of Alaska Power & Telephone Company.



December 7, 2005

Magalie R. Salas  
Office of Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, D.C. 20426

Re: Goat Lake Hydro Project  
Project No. 11077-022  
*3<sup>rd</sup> Year Results of 5 Year Grayling Monitoring Plan*

Dear Ms. Salas:

This e-filing is to provide the results from the Goat Lake grayling monitoring that occurred this summer for the Goat Lake Hydroelectric Project, No.11077. As a part of the license amendment of February 7, 2003, and license Article 409, we are to monitor the grayling for five years to make sure they continued to successfully access the inlet stream they spawn in. This is the third year of the five year monitoring. These results were submitted to the resource agencies on October 27, 2005 (cover letters enclosed). No comments were received.

Enclosed is a chart showing lake elevation in relation when fish were observed in the inlet stream. Another chart shows the water temperature throughout the period of the 2005 survey. Also enclosed are photos of the grayling in the stream. Although present in the inlet stream, no attempt to catch fish was made.

Respectfully Submitted,

Glen D. Martin  
Project Compliance Manager  
360-385-1733 x122

**GOAT LAKE HYDRO PROJECT  
5-YEAR GRAYLING MONITORING PLAN**

**THIRD YEAR REPORT (2005)**

Attached are two charts, (1) lake elevation at time of fish observations; (2) "Inlet Stream" temperatures during the summer and early fall. A notation is provided for when fish were observed in the "Inlet Stream" on the lake elevation chart. Also attached are photos of the grayling in the "Inlet Stream." No effort was made to fish for the grayling this year. Field notes are below:

On June 28, 2005: Lake level -5.0 feet. Two temperature loggers were installed in the Goat Lake "Inlet Stream," one at the second large pool upstream from the lake and the other 50-feet from the rock cliff upstream. (Both these locations the same as last two years.) No fish were observed in the stream at that time, however the helicopter pilot over-flew the stream while flying in, which may scare fish into hiding.

On August 12, 2005: Lake level -0.37 feet. The lake temperature, measured one foot below surface, was at 59.5°F. The "Inlet Stream" temperature was 47.0°F at the second large pool upstream from the lake. Water temperature in the "Inlet Stream" 50 feet from the rock cliff was 44.5°F.

Fourteen grayling were observed in the stream above full lake level from where you first see open water in the "Inlet Stream" to approximately 50 feet from the rock cliff. The stream was clear providing good visibility. No attempt was made to catch fish with rod & reel, either in the lake or in the stream. The fish were skittish and the "Inlet Stream" was lower than expected in the warm temperatures. Of the fourteen grayling, five of the fish were adults ranging from 12-15" in length and nine were probably 2<sup>nd</sup> year fish with lengths ranging from 5-7". Ambient air temperature at the lake was 56°F.

On October 3, 2005: Lake level -0.15 feet. The stream temperature in the second pool from the mouth was 36°F. There were two 6" grayling in the Inlet Stream above full lake level. Temperature dataloggers were collected at this time.

No obstructions in the inlet stream noted during surveys.





August 12, 2005: Grayling in Inlet Stream (circled here for visibility)



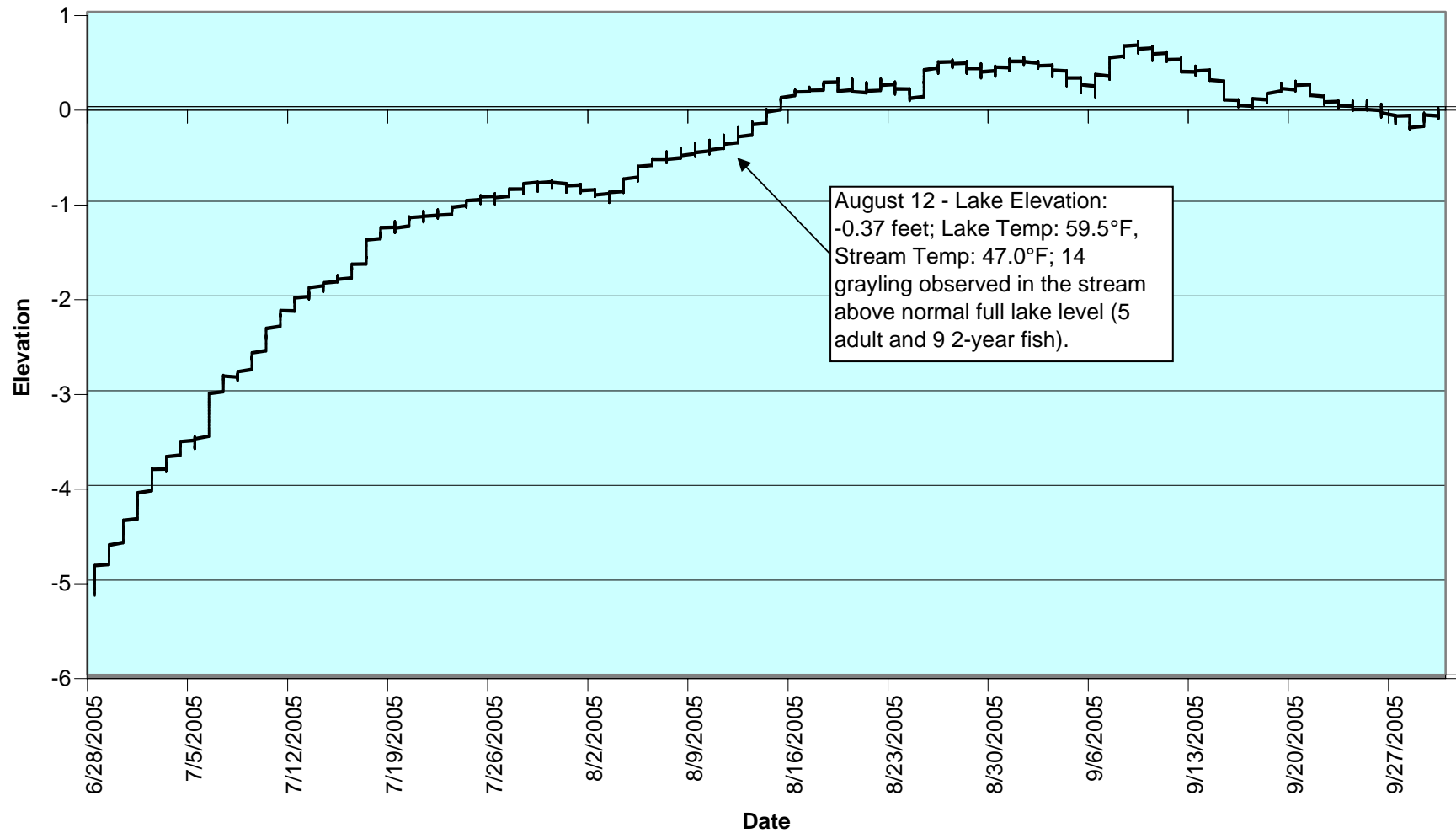
August 12, 2005: Inlet Stream Looking Upstream (lake would be to the left)



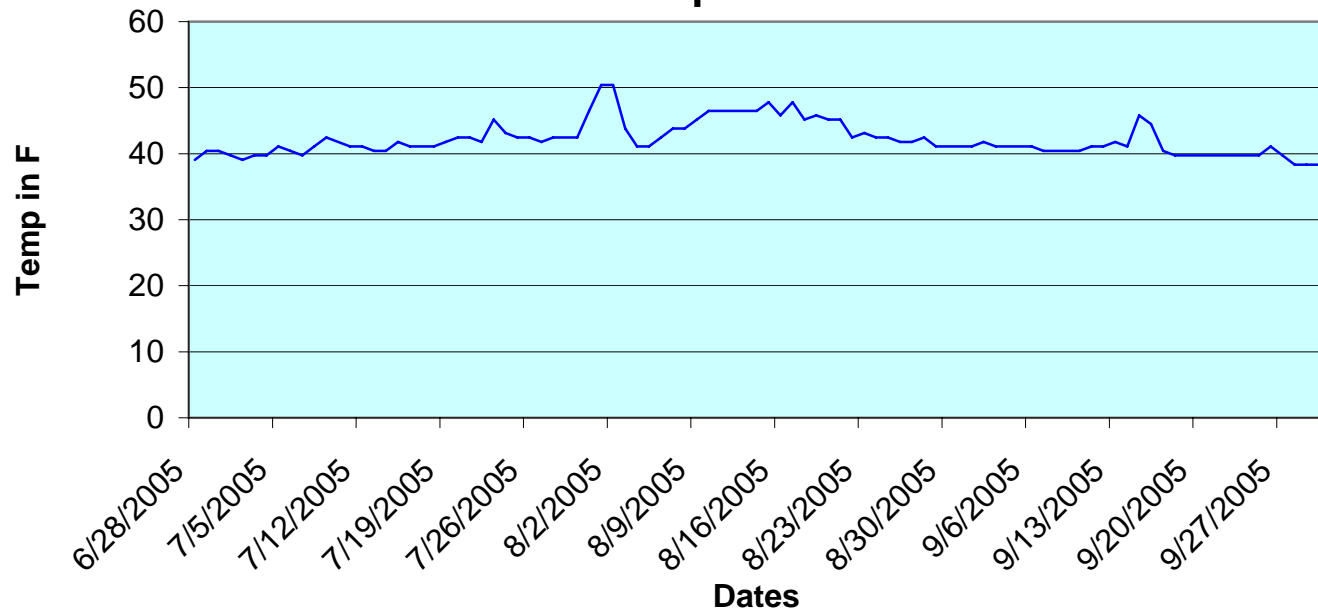


June 13, 2002: Photo of Inlet Stream looking West at Goat Lake (for reference).

## 2005 Goat Lake Elevation & Stream Temperature



# Goat Lake Hydro Inlet Stream Temperature - 2005



**OCTOBER 27, 2005**

**CORRESPONDENCE**

October 27, 2005

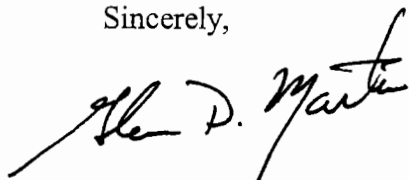
Jim Ferguson  
Hydro Coordinator  
Alaska Department of Fish & Game  
333 Raspberry Road  
Anchorage, AK 99518

Re: Goat Lake Hydro Project  
Project No. 11077-022  
*3<sup>rd</sup> Year Results of 5 Year Grayling Monitoring Plan*

Dear Mr. Ferguson:

Enclosed for your review is the third year of the five year grayling monitoring plan, for Goat Lake Hydro. Please provide any comments you may have by December 1, 2005.

Sincerely,



Glen D. Martin  
Project Compliance Manager  
360-385-1733 x122

October 27, 2005

Brian Goettler  
Acting District Ranger  
U.S. Forest Service  
Juneau Ranger District  
8465 Old Dairy Road  
Juneau, AK 99801

Re: Goat Lake Hydro Project  
Project No. 11077-022  
*3<sup>rd</sup> Year Results of 5 Year Grayling Monitoring Plan*

Dear Mr. Goettler:

Enclosed for your review is the third year of the five year grayling monitoring plan, for Goat Lake Hydro. Please provide any comments you may have by December 1, 2005.

Sincerely,



Glen D. Martin  
Project Compliance Manager  
360-385-1733 x122

October 27, 2005

Sheila Martin  
Alaska Department of Natural Resources  
Office of Habitat Management & Permitting  
P.O. Box 240020  
Douglas, AK 99824-0020

Re: Goat Lake Hydro Project  
Project No. 11077-022  
*3<sup>rd</sup> Year Results of 5 Year Grayling Monitoring Plan*

Dear Ms. Martin:

Enclosed for your review is the third year of the five year grayling monitoring plan, for Goat Lake Hydro. Please provide any comments you may have by December 1, 2005.

Sincerely,



Glen D. Martin  
Project Compliance Manager  
360-385-1733 x122



October 27, 2005

Edward Grossman  
U.S. Fish & Wildlife Service  
3000 Vintage Blvd., #201  
Juneau, AK 99801-7100

Re: Goat Lake Hydro Project  
Project No. 11077-022  
*3<sup>rd</sup> Year Results of 5 Year Grayling Monitoring Plan*

Dear Mr. Grossman:

Enclosed for your review is the third year of the five year grayling monitoring plan, for Goat Lake Hydro. Please provide any comments you may have by December 1, 2005.

Sincerely,



Glen D. Martin  
Project Compliance Manager  
360-385-1733 x122

**DEPT. OF ENVIRONMENTAL CONSERVATION**

SOUTHEAST REGIONAL OFFICE  
410 WILLOUGHBY AVE., SUITE 105  
JUNEAU, AK 99801

PH: (907) 465-5350  
FAX: (907) 465-5362

October 3, 1994

CERTIFIED MAIL #P-301 379 842  
RETURN RECEIPT REQUESTED

Mr. Glenn Martin  
Alaska Power & Telephone Co.  
P.O. Box 222  
Port Townsend, WA 98358

Re: GOAT LAKE HYDROELECTRIC PROJECT  
FERC #11077 Near SKAGWAY, ALASKA

Dear Mr. Martin:

The Department of Environmental Conservation reviewed your request on September 6, 1994, for a waiver of the Water Quality Certification under Section 401 (a)(1) of the Federal Water Pollution Control Act.

This letter is notification to you that the 401 certification of the Goat Lake Hydroelectric project is waived.

Sincerely,



Ron Flinn  
Program Manager

cc: Elizaveta Shadura, ADNR, Juneau  
Susan Cantor, EPA, Anchorage  
Lorraine Marshall, ADGC, Juneau  
Lana Shea, ADF&G, Juneau  
Joan Hughes, ADEC/SERO  
Lois Cashell, FERC, Wash., D.C.  
Dean Stromwell, Office of Hydro-  
power Licensing, Wash., D.C.

Steven Pennoyer, NMFS  
Nevin Holmberg, USF&WS  
Andy Pekovich, ADNR  
ADEC/Juneau District Office  
U.S. Forest Service, Juneau  
Hector Perez, FERC, Wash., D.C.  
(Fax #202-219-0125)

UNITED STATES OF AMERICA 76 FERC 62,032  
FEDERAL ENERGY REGULATORY COMMISSION

Alaska Power and Telephone )  
Company

Project No. 11077-001

ORDER ISSUING LICENSE  
(Major Project)  
(Issued July 15, 1996)

On May 31, 1994, the Alaska Power and Telephone Company (AP&T) filed, pursuant to Part I of the Federal Power Act (FPA),<sup>1/</sup> an application for a major license to construct, operate and maintain the 4-megawatt (MW) Goat Lake Hydroelectric Project No. 11077 (Goat Lake Project), to be located on Pitchfork Falls, near the town of Skagway, in the First Judicial District in southeast Alaska. The project would occupy about 270 acres of the Tongass National Forest.

Notice of the application has been published. No one has objected to issuance of this license. Comments received from interested agencies and individuals have been fully considered in determining whether to issue this license.

The staff issued a draft environmental assessment (EA), jointly prepared with the Forest Service (FS), for this project on March 11, 1996. Comments on the draft EA were filed by the U.S. Fish and Wildlife Service, AP&T, and the National Park Service. Their concerns were considered in preparing the final EA for this project, which was issued on May 22, 1996, and is attached to and made part of this license order. The staff also completed a Safety and Design Assessment on May 9, 1996, which is available in the Commission's public file for this project.

PROJECT DESCRIPTION

The project would consist of a 14-foot-wide, 125-foot-long spillway to replace the existing natural lake outlet which would be filled in, a submerged wedgewire screen intake assembly in Goat Lake, a 600-foot-long siphon pipe attached to a vacuum pump assembly within a siphon pump house, a pumpback station (a metal building with two 30-horsepower pumps connected to a 14-inch-diameter pipe for returning water to the lake), a 6,200-foot-long steel penstock extending from the pumpback station to the powerhouse, a powerhouse with an installed capacity of 4 MW, a small substation, a 3,400-foot-long transmission line, and other

<sup>1/</sup> 16 U.S.C. — 791a-825r.

appurtenances. A detailed project description is contained in ordering paragraph B(2).

#### WATER QUALITY CERTIFICATION

On September 1, 1994, AP&T applied to the Alaska Department of Environmental Conservation (Alaska DEC) for water quality certification for the Goat Lake Project, as required by Section 401 of the Federal Water Pollution Control Act (Clean Water Act) 2/. The Alaska DEC received this request on September 6, 1994. By letter dated October 3, 1994, the Alaska DEC waived certification for the project.

#### COASTAL ZONE MANAGEMENT PROGRAM

On August 18, 1994, AP&T applied to the Alaska Division of Governmental Coordination (Alaska DGC) for a consistency determination of the project with the coastal zone management program (CZMP). On September 6, 1994, the Alaska DGC acknowledged receipt of AP&T's certification request.

On November 27, 1995, the Alaska DGC certified that the Goat Lake Project was consistent with the Alaska CZMP and also with the Skagway Coastal Management Plan. No conditions or stipulations were included.

#### COMPREHENSIVE PLANS

Section 10(a)(2)(A) of the FPA, 16 U.S.C. \_ 803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. 3/ Under Section 10(a)(2)(A), federal and state agencies filed 23 plans that address various resources in Alaska. Of these, the staff identified and reviewed three

2/ 33 U.S.C. \_1341(a)(1).

3/ Comprehensive plans for this purpose are defined at 18 C.F.R. \_ 2.19 (1995).

conflicts were found.

#### RECOMMENDATIONS OF FISH AND WILDLIFE AGENCIES

Section 10(j)(1) of the FPA 5/ requires the Commission to include license conditions, based on recommendations of federal and state fish and wildlife agencies submitted pursuant to the Fish and Wildlife Coordination Act, 6/ for the protection of, mitigation of adverse impacts to, and enhancement of fish and wildlife. No federal or state fish and wildlife agency recommendations were filed for the project in response to our notice that the application was ready for environmental analysis.

#### SECTION 4(e) FINDINGS AND CONDITIONS

Section 4(e) of the FPA, 7/ requires that Commission licenses for projects located within United States reservations must include all conditions that the Secretary of the department under whose supervision the reservation falls shall deem necessary for the adequate protection and utilization of such reservation. The project occupies land of the Tongass National Forest, which is under the FS supervision. By letter dated June 17, 1996, the FS submitted its comments on the proposed project and its conditions for inclusion in any license. 8/ The FS's

4/ (1) Alaska Department of Natural Resources, 1979, Haines-Skagway Area Land Use Plan, Juneau, Alaska; (2) U.S. Forest Service, 1991, Tongass National Forest Proposed Revised Land and Resource Management Plan, Ketchikan, Alaska; (3) U.S. Fish and Wildlife Service and Canadian Wildlife Service, 1986, North American Wildlife Management Plan, Washington, D.C.

5/ 16 U.S.C. \_803(j)(1).

6/ 16 U.S.C. \_661 et seq.

7/ 16 U.S.C. \_797(e).

8/ In summary, the Forest Service's conditions are:

- Condition No. 1 - Requirement to Obtain a FS Special-Use Authorization
- Condition No. 2 - FS Approval of Final Design
- Condition No. 3 - Approval of Changes After Initial Construction
- Condition No. 4 - Consultation
- Condition No. 5 - Minimum Streamflow Regime

## COMPREHENSIVE DEVELOPMENT

Sections 4(e) and 10(a)(1) of the FPA, 16 U.S.C. \_\_ 797(e) and 803(a)(1), require the Commission, in acting on applications for license, to give equal consideration to the power and development purposes and to purposes of energy conservation, the protection, mitigation of damage to, and enhancement of fish and wildlife, the protection of recreational opportunities, and the preservation of other aspects of environmental quality. Any license issued shall be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. The decision to license this project, and the terms and conditions included herein, reflect such consideration.

In the EA, the staff examined the proposed project including AP&T's proposed mitigation measures and the no-action alternative. Under the no-action alternative the project would not be built. Therefore, there would be no changes to the physical, biological, or cultural resources of the area. The generation that the proposed project would provide would not occur. The recommended (preferred) option the staff selected is to issue a license for the project as proposed by AP&T, including their proposed mitigation. The final FS section 4(e) conditions have been incorporated into the staff's preferred alternative.

The staff recommend this option because: (1) the net benefits of the project outweigh the consequences associated with taking no action; (2) issuance of an original hydropower license would allow AP&T to construct and operate the project as a small but dependable source of electrical energy for its customers; (3) the project would meet the increasing demand for electric power in Skagway and avoid the need for an equivalent amount of fossil-fuel-fired, electric generation and capacity, thereby continuing to help conserve these nonrenewable energy resources and reduce atmospheric pollution; and (4) the proposed environmental

- Condition No. 6 - Guaranteed Priority Flow Bypass Device
- Condition No. 7 - Visual Resource Protection Plan
- Condition No. 8 - Erosion Control Plan
- Condition No. 9 - Solid Waste and Waste Water Plan
- Condition No. 10 - Hazardous Substance Plan
- Condition No. 11 - Cultural Resource Protection
- Condition No. 12 - Wildlife Mitigation Plan

Skagway River Valley.

The staff concluded, and I concur, that issuance of a new license for the Goat Lake Project would not constitute a major federal action significantly affecting the quality of the human environment.

In determining whether a proposed project will be best adapted to a comprehensive plan for developing a waterway for beneficial public purposes, pursuant to Section 10(a)(1) of the FPA, 16 U.S.C. \_ 803(a)(1), the Commission considers a number of public interest factors, including the projected economic benefits of project power.

Under the Commission's new approach to evaluating the economics of hydropower projects, as articulated in Mead Corporation, Publishing Paper Division, 9/ the Commission employs an analysis that uses current costs to compare the costs of the project and likely alternative power with no forecasts concerning potential future inflation, escalation, or deflation beyond the license issuance date. The basic purpose of the Commission's economic analysis is to provide a general estimate of the potential power benefits and the costs of a project, and reasonable alternatives to project power. The estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license.

Based on current economic conditions, without future escalation or inflation, and assuming AP&T's mid-load forecast, the proposed Goat Lake Project would provide an average of 9.7 GWh of energy annually, at an annual cost of about \$952,000 (98 mills/kWh) or about \$182,000 (18.8 mills/kWh) less than the current cost of an equivalent amount of power using alternative power resources (diesel-fuel powered generators for the Skagway area).

Based on the staff's review of the agency and public comments filed on this project, my review of staff's evaluation of the environmental and economic effects of the proposed project and its alternatives, and our analysis pursuant to Section 10(a)(1) of the FPA, I find that the Goat Lake Project will be best adapted to comprehensive development of the Pitchfork Falls for beneficial public uses.

9/ 72 FERC \_ 61,027 (1995).

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#### TERM OF LICENSE

Section 6 of the FPA 10/ states that licenses under Part

I of the FPA shall be issued for a period not to exceed 50 years. Because the Goat Lake Project involves an original license with substantial new construction, the license is issued for a period of 50 years.

#### SUMMARY OF FINDINGS

Background information, analysis of impacts, support for related license articles, and the basis for a finding of no significant impact on the environment are contained in the final EA. Issuance of this license is not a major federal action significantly affecting the quality of the human environment.

The design of this project is consistent with the engineering standards governing dam safety. The project will be safe if constructed, operated, and maintained in accordance with the requirements of this license. Analysis of related issues is provided in the S&DA.

I conclude that the project will not conflict with any planned or authorized development, and will be best adapted to a comprehensive plan for development of the waterway for beneficial public uses.

#### THE DIRECTOR ORDERS:

(A) A license is issued to the Alaska Power and Telephone Company (licensee), for a period of 50 years, effective the first day of the month in which this order is issued, to construct, operate, and maintain the Goat Lake Project No. 11077. This license is subject to the terms and conditions of the Federal Power Act (FPA), which is incorporated by reference as part of this license, and to the regulations the Commission issues under the provisions of the FPA.

(B) The Goat Lake Project No. 11077 consists of:

(1) All lands, to the extent of the licensee's interests in those lands, enclosed by the project boundary shown by Exhibit G:

10/ 16 U.S.C. \_ 799.

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Exhibit G- FERC No. 11077-

Showing



1	1	Land Status and Project Location
2	2	Facility Location and Project Boundary
3	3	Wetland Inventory

(2) Project works consisting of: (a) a 125-foot-long spillway to replace the existing natural lake outlet which would be filled in; (b) a submerged intake assembly positioned in Goat Lake at elevation 2,875 feet mean sea level (msl) with a mechanically operated trash rake for cleaning; (c) a 30-inch-diameter, 600-foot-long steel or high density polyethylene chloride siphon pipe attached to a vacuum pump assembly within a 12-foot by 12-foot siphon pump house; (d) a pumpback/valve station consisting of a 10-foot by 18-foot metal building with two 30-horsepower pumps connected to a 14-inch-diameter pipe for returning water to the lake; 11/ (e) an 8-foot-high, 25-foot-long concrete retaining wall with a 14-foot-wide spillway (elevation 2,876 feet msl) forming a 0.014-acre-foot storage catchbasin located in a portion of the existing pond; (f) a 6,200-foot-long, 22-inch-diameter steel penstock extending from the pumpback station to the powerhouse; (g) a powerhouse containing one horizontal twin jet Pelton turbine unit with a generating capacity of 4 MW and a maximum hydraulic capacity of 32 cubic feet per second (cfs); (h) a small substation with a pad-mounted step-up transformer, automatic recloser, and transmission line dead-end structure adjacent to the powerhouse; (i) a 3,400-foot-long, 24.9-kilovolt (kV) aerial transmission line on wooden poles extending from the substation, across the Skagway River to the Customs Border Station where it interties with AP&T's existing 24.9-kV transmission line to Skagway; (j) a single cable, 500-foot-long aerial tram originating near the end of a 1,000-foot-long access road within a 60-foot-wide right-of-way to the Klondike International Highway to provide access to the project; and (k) other appurtenances.

The project works generally described above are more

11/ The proposed 30-inch siphon pipe and 14-inch water return pipe would be laid in the existing 5-foot-wide natural lake outlet before it is filled.

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specifically described in Sections 3.1 to 3.11 of Exhibit A of the application and shown by Exhibit F:

Exhibit F- FERC No. 11077-

Showing

1	4	Site Plan
1.1	5	Geology Site Plan
2	6	Penstock Profile
3.1	7	Headworks Plan
3.2	8	Pumpback and Valve House Plan View
3.3	9	Pumpback Catchbasin Profile
4.1	10	Siphon Details
4.2	11	Intake Screen
4.3	12	Siphon Intake
4.4	13	Intake Cleaning Blade Details
5.1	14	Penstock Supports
5.2	15	Penstock Railroad Crossing
6	16	Powerhouse Site Plan
7	17	Powerhouse Floor Plan
8	18	Powerhouse Section
9.1	19	Tram and Access Road Plan View
9.2	20	Tram Profile
9.3	21	Tram Passenger Car

(3) All of the structures, fixtures, equipment, or facilities used to operate or maintain the project and located within the project boundary, all portable property that may be used in connection with the project and located within or outside the project boundary, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

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(C) Those sections of Exhibit A and Exhibits F and G described above are approved and made part of the license for the Goat Lake Project No. 11077.

(D) The license for the Goat Lake Project No. 11077 is subject to the articles set forth in Form L-2, entitled "Terms

and Conditions of License for Unconstructed Major Project Affecting Lands of the United States" (October 1995), and to the following articles. Articles 101 through 112 were submitted by the FS under Section 4(e) of the FPA.

Article 101. Within six months following the date of issuance of this license and before starting any activities the Forest Service (FS) determines to be of a land-disturbing nature, the licensee shall obtain from the FS a special-use authorization for the occupancy and use of National Forest System (NFS) lands, and shall file that authorization with the Director, Office of Hydropower Licensing.

The licensee may commence land-disturbing activities authorized by the license and special-use authorization 60 days following the filing date of such authorization, unless the Director, Office of Hydropower Licensing, prescribes a different commencement schedule.

Notwithstanding the authorizations granted under the Federal Power Act, NFS lands within the project boundaries shall be managed by the FS under the laws, rules, and regulations applicable to the NFS. The terms and conditions of the FS special-use authorization are enforceable by the FS under the laws, rules, and regulations applicable to the NFS. The violation of such terms and conditions also shall be subject to applicable sanctions and enforcement procedures of the Commission at the request of the FS. In the event there is a conflict between any provisions of the license and FS special-use authorization, the special-use authorization shall prevail on matters which the FS deems to affect NFS resources.

Article 102. Before any construction of the project occurs on National Forest System (NFS) land, the licensee shall obtain the prior written approval of the Forest Service (FS) for all final design plans for project components which the FS deems as affecting or potentially affecting NFS resources. The licensee shall follow the schedules and procedures for design review and approval specified in the FS special-use authorization. As part of such prior written approval, the FS may require adjustments in final plans and facility locations to preclude or mitigate impacts and to assure that the project is compatible with on-the-ground conditions. Should such necessary adjustments be deemed by the FS, the Commission, or the licensee to be a substantial change, the licensee shall follow the procedures of Article 2 (Form L-2) of the license. Any changes to the license made for

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any reason pursuant to Article 2 or Article 3 (Form L-2) shall be made subject to any new terms and conditions of the Secretary of Agriculture made pursuant to section 4(e) of the Federal Power Act.

Article 103. Notwithstanding any Commission approval or license provisions to make changes to the project, the licensee

shall get written approval from the Forest Service (FS) prior to making any changes in the location of any constructed project features or facilities, or in the uses of project lands and waters, or any departure from the requirements of any approved exhibits filed with the Commission. Following receipt of such approval from the FS, and at least 60 days prior to initiating any such changes or departure, the licensee shall file a report with the Commission describing the changes, the reasons for the changes, and showing the approval of the FS for such changes. The licensee shall file an exact copy of this report with the FS at the same time it is filed with the Commission. This article does not relieve the licensee from the amendment or other requirements of Article 2 (Form L-2) or Article 3 (Form L-2) of this license.

Article 104. Each year during the 60 days preceding the anniversary date of the license, the licensee shall consult with the Forest Service (FS) with regard to measures needed to ensure protection and development of the natural resource values of the project area. Within 60 days following such consultation, the licensee shall file with the Commission evidence of the consultation with any recommendations made by the FS. The Commission reserves the right, after notice and opportunity for hearing, to require changes in the project and its operation that may be necessary to accomplish natural resource protection.

Article 105. During the construction and operation of the facilities authorized by this license, the licensee shall maintain during twelve daylight hours, in Pitchfork Falls, as measured above the railroad tracks, the following continuous, minimum flows:

May 1 through September 30	13 cubic feet per second (cfs)
October 1 through April 30	0 cfs

The licensee may temporarily modify minimum flows if required by operating emergencies beyond the control of the licensee. The licensee may also modify minimum flows for short periods upon written consent of the Forest Service.

Article 106. The licensee shall construct, operate, and maintain a guaranteed priority streamflow device as part of the diversion/intake structure. Required stream maintenance flows

adequate to maintain the conditions described in Article 105 shall be automatically released through this device, before any flow can be diverted into the conduit. The licensee shall install a water measurement control section with a continuously-recording stream gage, upstream of Pitchfork Falls that will accurately measure the bypass flow. The licensee shall provide a stage-discharge chart to the Forest Service (FS) prior to commencement of operation of the project. The FS approval must

be obtained for the design of the bypass mechanism and the design and location of the measuring control section and stream gage prior to construction. The licensee shall file a report of the streamflow at the gaging station by December 31, of each year for the preceding water year. The report must be filed with the Juneau Ranger District of the Tongass National Forest.

Article 107. Within one year following the date of issuance of this license and before starting any activities the Forest Service (FS) determines to be of a land-disturbing nature on National Forest System (NFS) land, the licensee shall file with the Director, Office of Hydropower Licensing, a plan approved by the FS for the design and construction of the project facilities in order to preserve or enhance its visual character. The plan must consider facility configurations and alignments, building materials, color, conservation of vegetation, landscaping, and screening. Project facilities of concern to this plan include, among other things, clearings, diversion structures, penstocks, pipes, ditches, transmission lines and corridors, and access roads.

The licensee shall not commence activities the FS determines to be affected by the plan until after 60 days following the filing date, unless the Director, Office of Hydropower Licensing, prescribes a different commencement schedule.

Article 108. Within one year following the date of issuance of this license and before starting any activities the Forest Service (FS) determines to be of a land-disturbing nature on National Forest System land, the licensee shall file with the Director, Office of Hydropower Licensing, a plan approved by the FS for the control of erosion, and soil mass movement.

The licensee shall not commence activities the FS determines to be affected by the plan until after 60 days following the filing date, unless the Director, Office of Hydropower Licensing, prescribes a different commencement schedule.

Article 109. Within one year following the date of issuance of this license and before starting any activities the Forest Service (FS) determines to be of a land-disturbing nature on National Forest System land, the licensee shall file with the Director, Office of Hydropower Licensing, a plan approved by the FS for the treatment and disposal of solid waste and waste water

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generated during construction and operation of the project. At a minimum, the plan must address the estimated quantity of solid waste and waste water generated each day; the location of disposal sites and methods of treatment; implementation schedule; areas available for disposal of wastes; design of facilities; comparisons between on and offsite disposal; and maintenance programs.

The licensee shall not commence activities the FS determines

to be affected by the plan until after 60 days following the filing date, unless the Director, Office of Hydropower Licensing, prescribes a different commencement schedule.

Article 110. Within one year following the date of issuance of this license and at least 60 days before starting any activities the Forest Service (FS) determines to be of a land-disturbing nature on National Forest System land (NFS), the licensee shall file with the Director, Office of Hydropower Licensing, a plan approved by the FS for oil and hazardous substances storage and spill prevention and cleanup.

At a minimum, the plan must require the licensee to: (a) maintain in the project area, a cache of spill cleanup equipment suitable to contain any spill from the project; (b) periodically inform the FS of the location of the spill cleanup equipment on NFS lands and of the location, type, and quantity of oil and hazardous substances stored in the project area; and (c) inform the FS immediately of the nature, time, date, location, and action taken for any spill.

The licensee shall not commence activities the FS determines to be affected by the plan until after 60 days following the filing date, unless the Director, Office of Hydropower Licensing, prescribes a different commencement schedule.

Article 111. Within one year following the date of issuance of this license and before starting any activities the Forest Service (FS) determines to be of a land-disturbing nature, the licensee shall complete the testing as identified in the Memorandum of Agreement (MOA) among the FS, State Historic Preservation Office, the Advisory Council on Historic Preservation, and Commission.

Article 112. Within one year from the issuance of this license and before starting any activities the Forest Service (FS) determines to be of a land-disturbing nature on National Forest System land, the licensee shall file with the Director, Office of Hydropower Licensing, a wildlife habitat mitigation plan approved by the FS. This plan must identify requirements for construction and mitigation measures to meet FS wildlife habitat objectives and standards. The plan also must include dates for accomplishing these objectives and standards and must

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identify needs for the timing of any additional studies necessary.

The licensee shall not commence activities the FS determines to be affected by the plan until after 60 days following the filing date, unless the Director, Office of Hydropower licensing, prescribes a different commencement schedule.

Article 201. The licensee shall pay the United States the following annual charge, effective as of the date of commencement

of project construction:

(a) For the purposes of reimbursing the United States for the cost of administering Part I of the Federal Power Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 4,000 kilowatts.

(b) Recompensing the United States for use, occupancy, and enjoyment of 270 acres of its lands, other than for transmission line right-of-way.

Article 202. Pursuant to Section 10(d) of the Federal Power Act, after the first 20 years of operation of the project under license, a specified reasonable rate of return upon the net investment in the project shall be used for determining surplus earnings of the project for the establishment and maintenance of amortization reserves. The licensee shall set aside in a project amortization reserve account at the end of each fiscal year one half of the project surplus earnings, if any, accumulated after the first 20 years of operation under the license, in excess of the specified rate of return per annum on the net investment. To the extent that there is a deficiency of project earnings below the specified rate of return per annum for any fiscal year after the first 20 years of operation under the license, the licensee shall deduct the amount of that deficiency from the amount of any surplus earnings subsequently accumulated, until absorbed. The licensee shall set aside one-half of the remaining surplus earnings, if any, cumulatively computed, in the project amortization reserve account. The licensee shall maintain the amounts established in the project amortization reserve account until further order of the Commission.

The specified reasonable rate of return used in computing amortization reserves shall be calculated annually based on current capital ratios developed from an average of 13 monthly balances of amounts properly includible in the licensee's long-term debt and proprietary capital accounts as listed in the Commission's Uniform System of Accounts. The cost rate for such ratios shall be the weighted average cost of long-term debt and preferred stock for the year, and the cost of common equity shall

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be the interest rate on 10-year government bonds (reported as the Treasury Department's 10 year constant maturity series) computed on the monthly average for the year in question plus four percentage points (400 basis points).

Article 203. Within 45 days of the issuance of the license, the licensee shall file a complete original set and two complete duplicate sets of aperture cards of all the approved drawings, and a third, partial duplicate set of aperture cards showing only the Exhibit G drawings. The set of originals must be reproduced on silver or gelatin 35mm microfilm. The duplicate sets are

copies of the originals made on diazo-type microfilm. All microfilm must be mounted on type D (3-1/2" x 7-3/8") aperture cards. The licensee shall submit two copies of Form FERC-587 with aperture cards.

Prior to microfilming, the FERC Drawing Number (11077-1 through 11077-21) shall be shown in the margin below the title block of the approved drawing. After mounting, the FERC Drawing Number must be typed on the upper right corner of each aperture card. Additionally, the Project Number, FERC Exhibit (e.g., F-1, G-1, etc.), Drawing Title, and date of issuance of this license must be typed on the upper left corner of each aperture card.

The complete original set and one complete duplicate set of aperture cards, and one copy of the Form FERC-587, must be filed with the Secretary of the Commission, ATTN: DPCA/ERB. The second complete duplicate set of aperture cards shall be filed with Commission's Portland Regional Office. The third, partial duplicate set of aperture cards (Exhibit G only) and the remaining copy of Form FERC-587 shall be filed with the Bureau of Land Management Office at the following address:

State Director  
Alaska State Office  
Bureau of Land Management  
Division of Lands and  
Renewable Resources (AK-930)  
ATTN: FERC Withdrawal Recordation  
222 W. 7th Avenue, No. 13  
Anchorage, AK 99513-7599

Article 301. The licensee shall commence construction of the project works within 2 years from the issuance date of the license and shall complete construction of the project within 4 years from the issuance date of the license.

Article 302. The licensee shall, at least 60 days prior to the start of construction, submit one copy to the Commission's Regional Director and two copies to the Director, Division of Dam Safety and Inspections of the final contract drawings and specifications for such pertinent features of the project, such

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as water retention structures, all necessary transmission facilities, powerhouse, and water conveyance structures. The Director of Dam Safety and Inspections may require changes in the plans and specifications.

Article 303. Within 90 days after finishing construction, the licensee shall file for Commission approval revised exhibits A, F, and G to describe and show the project as built.

Article 304. Before starting construction, the licensee shall review and approve the design of contractor-designed cofferdams and deep excavations and shall make sure construction



of the cofferdams and deep excavations is consistent with the approved design. At least 30 days before starting construction of the cofferdam, the licensee shall submit one copy to the Commission's Regional Director and two copies to the Commission (one of these copies shall be a courtesy copy to the Commission's Director, Division of Dam Safety and Inspections), of the approved cofferdam construction drawings and specifications and the letters of approval.

Article 401. At least six months before the start of any land-disturbing or land-clearing activities, the licensee shall file with the Commission, for approval, a final erosion and sediment control plan to control soil erosion and to minimize the quantity of sediment resulting from project construction and operation.

The plan shall be based on actual-site geological, soil, and groundwater conditions and on project design. The final erosion and sediment control plan must be complete and specific and shall be based on the draft erosion and sediment control plan submitted on March 30, 1995. The final erosion and sediment control plan shall include the Forest Service's (FS's) mandatory conditions imposed under Section 4(e) of the Federal Power Act that include: (a) an erosion and sediment control plan (Article 108); (b) a solid waste and waste water plan (Article 109); and (c) a hazardous substance plan (Article 110). The final erosion and sediment control plan shall include sediment control ponds, silt fence barriers, stream bank stabilization, rock entrance roads, a revegetation plan, and must comply with the Best Management Practices described in the FS Region 10 Soil and Water Conservation Handbook for this type of construction.

The licensee shall prepare the plan after consultation with the FS, the U.S. Fish and Wildlife Service, Alaska Department of Fish and Game, Alaska Department of Natural Resources, the Soil and Water Conservation Board and other interested agencies.

The licensee shall include with the plan documentation of consultation and copies of comments and recommendations on the completed plan after it has been prepared and provided to the

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agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations prior to filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on geological, soil, and groundwater conditions at the site.

The Commission reserves the right to require changes to the plan. No land-disturbing or land-clearing activities shall begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Article 402. The wildlife mitigation plan required by Article 112 shall be prepared after consultation with the U.S. Fish and Wildlife Service and the Alaska Department of Fish and Game, and shall include measures to: (a) leave as much vegetation as possible during construction of the powerhouse and penstock; (b) revegetate disturbed areas as soon as possible after disturbance and follow Forest Service (FS) guidelines for revegetating the disturbed areas; (c) use a helicopter or donkey-winch to transport the penstock to its location to protect as much natural vegetation as possible; and (d) design the penstock to avoid interference with wildlife movements. The plan must include a schedule for accomplishing these measures.

The licensee shall include with the plan documentation of consultation and copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments, if any, are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations prior to filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons for not adopting that recommendation.

The Commission reserves the right to require changes to the plan. No land-disturbing or land-clearing activities shall begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee shall implement the plan including any changes required by the Commission.

Article 403. The licensee shall design and construct the transmission line based on the licensee's conceptual design plan filed with the Commission in March 1995, in accordance with guidelines set forth in "Suggested Practices for Raptor Protection on Power Lines --- the state of the Art in 1981," by Raptor Research Foundation, Inc.

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The licensee shall consult with the U.S. Fish and Wildlife Service, the Alaska Department of Fish and Game, and the Forest Service in implementing these guidelines, and shall develop and implement a design that will provide adequate separation of energized conductors, ground wires, and other metal hardware, adequate insulation, and any other measures necessary to protect raptors and other large birds from electrocution.

As-built drawings of the transmission line must be included in the filings pursuant to Article 303.

Article 404. The licensee shall prepare the visual resource protection plan required by Article 107 in consultation with the Forest Service and the National Park Service, and shall file the

plan with the Commission, for approval, within one year of the date of issuance of this license or no later than six months before starting any land-clearing, land-disturbing, or spoil-producing activities at the project.

The licensee shall include with the plan documentation of consultation and copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments, if any, are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations prior to filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on landscape conditions and other site-specific conditions.

The Commission reserves the right to require changes to the plan. No land-disturbing or land-clearing activities shall begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee shall implement the plan including any changes required by the Commission.

Article 405. At least six months before the start of any land-disturbing activities, the licensee shall file with the Commission for approval, a plan to construct, operate, and maintain the priority streamflow release device and the continuously-recording stream gage required in Article 106. The filing shall include a stage-discharge chart.

The licensee shall prepare the plan after consultation with the Forest Service and the National Park Service. The licensee shall include with the plan documentation of consultation and copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments, if any, are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations prior to filing the plan with the Commission. If the licensee

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does not adopt a recommendation, the filing shall include the licensee's reasons, based on flows and other site-specific conditions.

The Commission reserves the right to require changes to the plan. No land-disturbing or land-clearing activities shall begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee shall implement the plan including any changes required by the Commission.

Article 406. The licensee shall file, with the Commission, annual reports for the preceding water year of the streamflow at the gaging station required in Article 106. The reports shall be filed by December 31, of each year for the duration of the project's license. The initial report shall be filed by December

31, of the year the project commences operation. The filing shall include comments on the report from the Forest Service.

Article 407. The licensee shall implement the Memorandum of Agreement (MOA) on cultural resources executed on May 20, 1996, for the Goat Lake Hydroelectric Project. Within one year after the date of issuance of the license, the licensee shall file, for Commission approval, the cultural resources management plan prepared pursuant to stipulations of the MOA. In preparing the cultural resources management plan, the licensee shall take into account the comments of the National Park Service in its letter to the Commission dated March 25, 1996, about protecting the visual integrity of the Skagway Historic District and White Pass National Historic Landmark.

Article 408. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and

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occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and water for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancement. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee

shall also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-Kv or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of

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interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-

half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must submit a letter to the Director, Office of Hydropower Licensing, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked exhibit G or K map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee shall consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved Exhibit R or approved report on recreational resources of an Exhibit E; or, if the project does not have an approved Exhibit R or approved report on

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recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; (ii) the grantee shall take all reasonable precautions to insure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project; and (iii) the grantee shall not unduly restrict public access to project waters.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational,

and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised exhibit G or K drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised exhibit G or K drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(E) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to the Commission filing. Proof of service on these entities must accompany the filing with the Commission.

(F) This order is issued under authority delegated to the Director and constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days of the date of this order, pursuant to 18 C.F.R. \_ 385.713. The filing

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of a request for rehearing does not operate as a stay of the effective date of this order or of any other date specified in this order, except as specifically ordered by the Commission. The licensee's failure to file a request for rehearing shall constitute acceptance of this order.

Fred E. Springer  
Director, Office of  
Hydropower Licensing

Project No. 11077-001

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FINAL  
ENVIRONMENTAL ASSESSMENT  
FOR HYDROPOWER LICENSE

Goat Lake Hydroelectric Project

FERC Project No. 11077-001

Alaska



Federal Energy Regulatory Commission  
Office of Hydropower Licensing  
Division of Project Review  
888 First Street, NE  
Washington, D.C. 20426

and

U.S. Forest Service  
Tongass National Forest - Chatham Area  
Juneau Ranger District  
8465 Old Dairy Road  
Juneau, Alaska 99801

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SUMMARY

The Alaska Power and Telephone Company (AP&T) proposes to construct, operate, and maintain the 4-megawatt Goat Lake Hydroelectric Project on Pitchfork Falls, near the town of Skagway in southeast Alaska. AP&T has applied to the Federal Energy Regulatory Commission (Commission) for an original hydropower license and to the U.S. Forest Service (FS) for a

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special-use authorization to operate the project on the Tongass National Forest.

To facilitate decisions whether to issue the hydropower license and special-use authorization, we (Commission and FS staffs) prepared this final environmental assessment to evaluate how the proposed project (FERC No. 11077-001) would affect environmental resources in the Goat Lake drainage area and determine whether additional protection or mitigation measures may be needed to protect and improve the environmental resources and provide the best comprehensive development of the waterway. In addition, we also examine the no-action alternative.

Accordingly, we agree with AP&T's proposed project and mitigation. We recommend that AP&T: (1) develop and implement a final erosion and sediment control plan to include detention of pond run-off, preventing localized erosion, stabilizing stream channel banks, controlling access road erosion, and handling solid waste, waste water, and hazardous substances; (2) leave as much vegetation as possible during project construction; (3) revegetate all disturbed areas from construction as soon after disturbance as possible using FS guidelines; (4) use a helicopter

or donkey-winch during project construction to protect the natural vegetation; (5) design the penstock to avoid interference with wildlife; (6) construct the transmission line to avoid possible hazards to large birds; (7) adjust the construction schedule to avoid possible mountain goat disturbance; (8) screen the powerhouse and substation using measures that match the surrounding aesthetic environment; (9) establish a 13 cubic feet per second instream flow over Pitchfork Falls, May through September for 12 hours a day to maintain the natural aesthetics of the area; and (10) develop and implement a cultural resources management plan.

Under our recommended alternative, we find that none of the resources--which include water, fishery, wildlife and terrestrial, visual, recreational, and cultural resources--would suffer significant adverse impacts. Therefore, no environmental impact statement is required.

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#### FINAL ENVIRONMENTAL ASSESSMENT

Federal Energy Regulatory Commission  
Office of Hydropower Licensing, Division of Project Review  
Washington, D.C.

and

U.S. Forest Service  
Tongass National Forest, Juneau Ranger District  
Juneau, Alaska

GOAT LAKE HYDROELECTRIC PROJECT  
FERC NO. 11077-001- ALASKA

#### I. INTRODUCTION

The Federal Energy Regulatory Commission (Commission), acting as lead agency, and the U.S. Forest Service (FS) -- Juneau Ranger District, Chatham Area, as cooperating agency, have prepared this final environmental assessment (FEA) for the proposed Goat Lake Hydroelectric Project. In accordance with the National Environmental Policy Act of 1969,12/ issuing a license decision on the project requires preparation of either an

EA or Environmental Impact Statement.

We (the Commission and FS staffs [staff]) analyze the environmental and socioeconomic impacts associated with constructing, operating, and maintaining this project, as proposed by Alaska Power and Telephone Company (AP&T). We also consider effects of alternatives to the project.

## II. APPLICATION

On May 31, 1994, AP&T filed an application with the Commission for a license to construct the proposed Goat Lake Hydroelectric Project. The proposed 4-megawatt (MW) seasonal storage project would be constructed along Pitchfork Falls,<sup>13/</sup>

by 12/ Pub. L. 91-190. 42 U.S. C. 4321-4347, January 1, 1970, as amended  
L. 97- Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub.  
258, \_4(b), Sept. 13, 1982.

from Goat 13/ Pitchfork Falls is a one-mile-long cascading stream that flows  
the Skagway Lake and descends 2,100 feet over a steep, 30 percent gradient to  
drop, is River. The most prominent portion of the falls, and the steepest

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located about 7 miles northeast of the town of Skagway in southeast Alaska (Figure 1), within sections 10, 11, 14, 15 and 16 of Township 27 South, Range 60 East, of the Copper River Meridian.

Figure 1. Location of the proposed Goat Lake Hydroelectric Project, FERC No. 11077-001, Alaska (Source: Alaska Power and Telephone Company 1994a, b).

located between the White Pass and Yukon Route Railroad and the Skagway River.

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Pitchfork Falls is a tributary to the Skagway River, which originates in Canada and generally flows southward and terminates at Taiya Inlet, adjacent to the town of Skagway. The project would occupy about 270 acres of the Tongass National Forest, administered by the Juneau Ranger District. A small portion of the project's proposed transmission line lies on 2.9 acres of state-owned lands. The U.S. Army Corps of Engineers (Corps) has concurrently evaluated a permit application from AP&T pursuant to Section 404 of the Clean Water Act, for dredging and filling activities associated with the project (Alaska Power and Telephone Company 1995f). The project is not intended for flood control, navigation, agricultural purposes, or irrigation.

We issued the jointly prepared Goat Lake draft Environmental Assessment (DEA) for comments on March 11, 1996. In response, we received 3 comment letters. We list the commenting entities in "Comments on the Draft Environmental Assessment," section V.F. All comment letters were carefully considered. The sections of the draft EA that have been modified as a result of our reevaluation are identified in Appendix A, "Comments on the Draft EA and Staff Responses."

### III. PURPOSE AND NEED FOR ACTION

#### A. Purpose of Action

The Federal Power Act (FPA) provides the Commission with the exclusive authority to license nonfederal water power projects on navigable waterways and federal lands for a period of up to 50 years.<sup>14/</sup> The Commission will use this FEA to decide: (1) whether or not to issue a license, (2) whether issuing AP&T an original hydropower license for the project would be a major federal action significantly affecting the quality of the human environment, and (3) what conditions, if any, would be placed on any license issued for the project.

To ensure that the Goat Lake Hydroelectric Project would be operated in a manner consistent with the National Forest System

14/ U.S.C. Sect 791(a)-825(r).

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lands and resources, the FS will use this FEA to decide: (1) what mandatory license terms and conditions they would require, under section 4(e) of the FPA, to adequately protect the Tongass National Forest, should the Commission issue an original license for the project, (2) whether to issue AP&T a special use authorization (SUA) for those portions of the project that fall on national forest lands, and (3) whether these required measures would be consistent with their multiple use, land stewardship responsibilities. The SUA would authorize occupancy and use of forest lands for hydropower development that would include requirements necessary for comprehensive and compatible use of natural resources, consistent with the purposes for which the forest was established.

#### B. Need for Power

AP&T proposes to use power from the Goat Lake Hydroelectric Project to replace generation from diesel powered generation facilities in the nearby town of Skagway, Alaska. Since Skagway has no transmission lines connected to any other area, there is no market for any power generated from the project other than that needed to meet Skagway's electrical demands. By supplementing AP&T's existing Dewey Lakes Hydropower Project, the proposed project would serve Skagway's residential, commercial, and industrial loads.

In 1994, AP&T's actual peak demand in the Skagway service area was 1,760 kilowatts. For the years 1974 to 1993, AP&T's electric loads for Skagway have been increasing at an average annual rate of 6 percent. From 1994 to 2003, AP&T's mid-load forecast predicts the electric loads will grow at an average of 5.5 percent annually. Beyond 2004, AP&T assumes an average mid-load growth of 1.4 percent annually.

Power from the proposed project would be useful in meeting the above need for power. When operational, power from the project would be available to displace diesel generation on AP&T's system, conserving fossil fuels and reducing atmospheric pollution.

#### IV. PROPOSED ACTION AND ALTERNATIVES

##### A. AP&T's Proposal

##### 1. Project Description

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AP&T proposes to construct the following project facilities (Figure 2): (1) a 14-foot-wide by 125-foot-long uncontrolled spillway to replace the existing natural lake outlet which would be filled in; (2) a submerged wedgewire screen intake assembly positioned in Goat Lake at elevation 2,875 feet mean sea level (msl), and with a mechanically operated trash rake for cleaning; (3) a 30-inch-diameter, 600-foot-long steel or high density polyethylene chloride siphon pipe attached to a vacuum pump assembly within a 12-foot by 12-foot siphon pump house; (4) a pumpback/valve station consisting of a 10-foot by 18-foot metal building with two 30-horsepower pumps connected to a 14-inch pipe for returning water to the lake; (5) an 8-foot-high by 25-foot-long concrete retaining wall with a 14-foot-wide spillway (elevation 2,876 feet msl) forming a 0.014-acre-foot storage catchbasin located in a portion of the existing pond; (6) a 6,200-foot-long, 22-inch-diameter steel penstock extending from the pumpback station to the powerhouse; (7) a single level, 30-foot by 40-foot powerhouse containing one horizontal twin jet Pelton turbine unit with a generating capacity of 4 MW and a maximum hydraulic capacity of 32 cubic feet per second (cfs); (8) a small substation with a

Figure 2. Major Features of the proposed Goat Lake Hydroelectric Project, FERC No. 11077-001, Alaska (Source: Alaska Power and



Telephone Company 1994a, b).

would be  
15/ The proposed 30-inch siphon pipe and 14-inch water return pipe  
laid in the existing 5-foot-wide natural lake outlet before it is  
filled.

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pad-mounted step-up transformer, automatic recloser, and transmission line dead-end structure adjacent to the powerhouse; and (9) a 3,400-foot-long, 24.9-kilovolt (kV) aerial transmission line on wooden poles extending from the substation, across the Skagway River to the Customs Border Station where it interties with AP&T's existing 24.9-kV transmission line to Skagway; and (10) a single cable, 500-foot-long aerial tram originating near the end of a 1,000-foot-long access road within a 60-foot-wide right-of-way be built from the Klondike International Highway to provide access to the project.

## 2. Project Operation

Goat Lake is a very deep natural impoundment. Inflows to Goat Lake come from a combination of precipitation and glacial runoff. The glacier, located above the moraine at the south end of the lake, also provides runoff to the pond below Goat Lake and to Pitchfork Falls, which descends about 2,100 feet in elevation from the pond to its confluence with the Skagway River.

AP&T proposes to automatically operate the project using the normal water outfall from Goat Lake to generate power. They also propose to draft Goat Lake to generate power during periods of low runoff or high energy demands. The normal water surface

elevation of Goat Lake is 2,915 feet msl and AP&T proposes to limit lake drawdown to 30 feet.

AP&T also proposes to pump water from the catchbasin below Goat Lake, back to Goat Lake for regulated storage. AP&T would pump from October through April, when there is no requirement to release flows into Pitchfork Falls,<sup>16/</sup> and May through September, during the hours the instream flow is not required. During the hours that AP&T proposes to provide flows to Pitchfork Falls, the pump output would be regulated to allow the required release of water to the falls. If natural water flow to the catchbasin would not be sufficient to meet the instream requirements, a valve would open to release water from Goat Lake to supplement flows.

AP&T would provide to the 6,200-foot-long bypassed reach, a minimum instream flow of 13 cfs May through September for 12 daylight hours per day.

### 3. Proposed Environmental Measures

AP&T proposes the following measures to protect environmental resources that may be affected by the project:

- \_ Implement an erosion and sediment control plan to

include measures that would detain pond run-off, prevent localized erosion, stabilize stream channel banks, and control access road erosion

- Leave as much vegetation as possible during powerhouse and penstock construction; revegetate all vegetated areas disturbed by project construction activities; follow FS guidelines for revegetating disturbed areas
- Use a helicopter or donkey-winch to transport the penstock to its location to protect as much natural vegetation as possible
- Design the penstock to avoid interfering with wildlife movements

16/ The flow release into Pitchfork Falls is to maintain the aesthetics, particularly in the steepest, cascading portion between the White Pass and Yukon Route Railroad and the Skagway River.

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- Design and construct the transmission line to prevent hazards to raptors and other large birds
- Adjust the construction schedule of the facilities at the lake to avoid disturbance to mountain goat mating and kidding
- Visually screen the powerhouse and substation with the use of vegetation and/or coloring to match the surrounding environment
- Establish a 13-cfs minimum instream flow over Pitchfork Falls during May through September for 12 daylight hours a day to maintain the aesthetics of the area, by use of a priority flow bypass device
- Implement a cultural resources management plan to protect portions of the Skagway Historic District and White Pass National Historic Landmark (Historic Landmark), which includes the Brackett Wagon Road and White Pass and Yukon Route Railroad (WP&YR RR); and the historic Canadian Oil pipeline affected or potentially affected by the project, pursuant to a memorandum of agreement (MOA) prepared in accordance with the Advisory Council of Historic Preservation's (Advisory Council) regulations (36 CFR 800) for the National Historic Preservation Act.

We discuss each of these measures in the individual resource sections of this FEA.

#### 4. Mandatory Requirements [4(e) Conditions]

Since the project occupies land of the Tongass National Forest, the FS has authority under Section 4(e) of the FPA, to impose mandatory conditions on any hydropower license the Commission would issue for the project. In its May 9, 1996, letter, the FS filed with the Commission, the following preliminary 4(e) conditions for the license (letter from Phil Janik, Regional Forester, U.S. Forest Service - Alaska Region, Juneau, Alaska, May 9, 1996), and stated that the final 4(e) terms and conditions for the license would be provided within 45 days after issuance of this FEA:

- Condition No. 1 - Requirement to Obtain a FS Special-Use Authorization

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- Condition No. 2 - FS Approval of Final Design
- Condition No. 3 - Approval of Changes After Initial Construction
- Condition No. 4 - Consultation
- Condition No. 5 - Minimum Steamflow Regime
- Condition No. 6 - Guaranteed Priority Flow Bypass Device
- Condition No. 7 - Visual Resource Protection Plan
- Condition No. 8 - Erosion Control Plan
- Condition No. 9 - Solid Waste and Waste Water Plan
- Condition No. 10 - Hazardous Substance Plan
- Condition No. 11 - Cultural Resource Protection
- Condition No. 12 - Fish and Wildlife Mitigation Plan

#### B. No-action Alternative

Under the no-action alternative the project would not be built. Therefore, there would be no changes to the physical, biological, or cultural resources of the area. The generation that the proposed project would provide would not occur. The no-action alternative is the benchmark from which we compare the proposed action and other action alternatives.

#### C. Alternatives Considered but Eliminated from Detailed Study

The following are descriptions of three alternative transmission line routes that were considered but eliminated from further consideration by AP&T:

##### Along the White Pass and Yukon Route Railroad

This alignment (about 4,400 feet long) would extend from the proposed substation upslope to the WP&YR RR, southerly along the railroad to the Clifton area, downslope across the Skagway River and lastly, upslope to the Customs Border Station. The reasons this alternative was ruled out from further consideration are that: (1) WP&YR RR plans to remove the existing telegraph line along the railroad right-of-way to provide less visual distraction to the natural aesthetics of the area and because the poles are not needed, (2) additional poles would further add to undesired visual impacts

AP&T for of the area, (3) WP&YR RR would impose cost prohibitive charges to  
steep constructing the transmission line on the right-of-way easement, (4)  
presents topography and limited access for construction and maintenance  
International engineering constraints, and (5) the visual impact to Klondike  
structures Highway users would be potentially significant due to the taller

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foot-high (55-foot-high transmission line poles) compared to the existing 30-telegraph poles.

On the East Side of the Skagway River

proposed This alignment (about 3,400 feet long) would extend from the  
2,900 feet to substation downriver and parallel to the Skagway River for about  
reasons the Clifton area, then upslope to the Customs Border Station. The  
this alternative was ruled out from further consideration are that:  
(1) construction would likely disturb the historic Brackett Wagon Road  
located along the east side of the river, (2) an extensive, time-consuming  
historic/cultural resources survey would be required to investigate  
presence of Gold Rush artifacts along this route, and the National Park  
Service discourages ground disturbance before completion of such surveys,  
(3) required mitigation to offset potential resource losses may be prohibitively  
expensive, (4) the FS and the town of Skagway may be interested in developing a  
powerline in this recreational foot trail along the Brackett Wagon Road and a  
increase area may not be compatible with land use and (5) this location would  
Highway. the visibility of the project from the Klondike International

Along the Klondike International Highway

proposed This alignment (about 3,900 feet long) would extend from the  
International substation across the Skagway River, upslope to the Klondike  
this Highway, and southerly to the Customs Border Station. The reasons  
degree of alternative was ruled out from further consideration are: (1) the  
bedrock slope for powerline construction to the highway and the amount of  
Department of present presents two engineering difficulties, (2) the Alaska  
due to the Transportation disallows pole line construction along the highway



viewed from the scenic nature of the highway, as seen from the WP&YR RR and as  
line highway, (3) visual quality would be impaired with the transmission  
view emerging from the valley to a point near highway pullouts used to  
Pitchfork Falls.

have some Although each of the transmission line routes considered may  
environmentally-merits, we agree with AP&T that the alternatives are more  
damaging and more costly to construct than the proposed alignment.

## V. CONSULTATION AND COMPLIANCE

### A. Agency Consultation

consult The Commission's hydropower regulations require applicants to  
application. with the appropriate resource agencies before filing a license  
Wildlife This consultation is the first step in complying with the Fish and  
Coordination Act, the Endangered Species Act, the National Historic

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Preservation Act, and other federal statutes. Pre-filing  
consultation must be  
complete and documented according to the Commission's regulations.

After the Commission accepts an application, formal comments  
may be  
submitted by concerned entities during a public notice period, in  
accordance  
with section 4.34(b) of the Commission's regulations under the FPA  
[18CFR  
\_4.34(b)]. The comments provided by concerned entities are made  
part of the  
record and are considered during review of the proposed project.

On August 29, 1995, and October 27, 1995, the Commission  
issued public  
notices that solicited comments and recommendations on the project.  
The  
Department of Interior (Interior) responded by letter dated November  
27, 1995,  
however no recommendations were made on the project.

#### B. Interventions

The Commission's January 6, 1995, notice solicited  
organizations and  
individuals to petition to intervene and become a party to any  
subsequent  
proceedings. There were no motions to intervene filed for the  
project.

#### C. Scoping

Before preparing this FEA, we conducted scoping to determine  
what issues  
and alternatives should be addressed. A scoping document (SD1) was  
distributed to agencies and others on May 18, 1995 (Federal Energy  
Regulatory  
Commission and U.S. Forest Service 1995), and noticed in the Federal  
Register,  
The Skagway News, and Capital City Weekly. Two scoping meetings  
were held on  
June 20 and June 22, 1995, in Skagway and Juneau, Alaska,  
respectively.  
Verbal comments received during the scoping meetings are recorded in  
the  
meeting transcripts (Ann Riley and Associates 1995a, 1995b).

National Park  
Gold Rush  
comments  
document  
scoping  
Road,  
type of  
concerns,  
baseline data on  
resources  
from  
These

In response to SD1, we received written comments from the Service (NPS) (letter from Clay Alderson, Superintendent, Klondike Park, Skagway, Alaska, June 22, 1995). These comments and the received at the scoping meetings were addressed in the final scoping (SD2) issued September 27, 1995. The main issues identified during were: project impacts on the cultural value of the Brackett Wagon cultural resources protection, access to the project, location and transmission system, mitigation of archeological and scenic minimizing vegetation impacts, measures to protect wildlife, mountain goats, time restrictions of bypass instream flows, natural management, project economics, contributions of air-borne pollution fossil-fueled generation, and baseline environmental information. These issues are addressed in this FEA.

#### D. Water Quality Certification

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On September 1, 1994, AP&T applied to the Alaska Department of Environmental Conservation (ADEC) for water quality certification for the Goat Lake Hydroelectric Project, as required by Section 401 of the Clean Water Act (33 U.S.C. \_1341). The ADEC received this request on September 6, 1994. On October 3, 1994, the ADEC waived AP&T's Section 401 water quality certificate (letter from R. Flinn, Program Manager, Alaska Department of Environmental Conservation, Juneau, Alaska, October 3, 1994).

E. Coastal Zone Management Act

Under Section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA), the Commission cannot issue a license for a project within or affecting a state's coastal zone, unless the state CZMA agency concurs with the license applicant's certification of consistency with that state's CZMA program, or the agency's concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant's certification.

On August 18, 1994, AP&T applied to the Alaska Division of Governmental Coordination (ADGC) for a consistency determination of the project with the coastal zone management program (letter from Stan Selmer, Site Coordinator, Alaska Power and Telephone Company, Skagway, Alaska, August 18, 1994). On September 6, 1994, the ADGC acknowledged AP&T's certification request.

On November 27, 1995, the ADGC certified that the Goat Lake Project was consistent with the Alaska CZMA and also with the Skagway Coastal Management Plan. No conditions or stipulations were included.

F. Comments on the Draft Environmental Assessment

Letter	Commenting Entity	Date of
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U.S. Fish and Wildlife Service  
..... March 25, 1996  
Alaska Power and Telephone Company  
..... April 4, 1996  
National Park Service  
.....  
April 15,  
1996

Appendix A includes the comments from the above entities along  
with our responses to them. Based on our responses, the corresponding  
sections of the FEA have been modified.

#### VI. ENVIRONMENTAL ANALYSIS

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In this section, staff first describes the general environmental setting in the project area. Included is a discussion of environmental resources in the Skagway River Valley that may be subject to cumulative effects from the Goat Lake Project when considered in combination with other actions affecting the resource.

In our detailed assessment, we discuss each environmental resource affected by the project. For each resource, we first describe the environment--which is the existing condition and the baseline against which to measure the effects of the proposed project and any alternative actions--and then the environmental effects of the project, including proposed mitigation measures. In evaluating the environmental effects of the project, we consider both site-specific effects and any cumulative effects to resources in the basin.

Unless we say otherwise, the sources of our information are the license application (Alaska Power and Telephone Company 1994a-c) and additional information filings by AP&T (Alaska Power and Telephone Company 1995a-e, 1995g).

#### A. General Description of the Goat Lake Drainage Area

The project would be located east of the Skagway River along Pitchfork Falls, about 7 miles northeast of Skagway, Alaska. Founded in 1896, at the extreme north end of Lynn Canal, Skagway became an important stopover of gold seekers on their way to the Klondike gold fields. With the ebbing of the Klondike Gold Rush (see section VI.B.6.), Skagway's population dwindled. The present mainstay of Skagway's economy is tourism, where many tourists visit the area each year for the natural scenery in the Skagway River Valley. The

project basin is also used occasionally for outdoor recreation such as hunting and camping.

The project area and Skagway River Valley have a remote, wild, and undeveloped character. In particular, the lower portion of Pitchfork Falls has a prominent series of cascading waterfalls which is a popular attraction among local residents and visitors to the area. The three significant linear features that Pitchfork Falls crosses are the WP&YR RR at elevation 1,104 feet msl, the Canadian Oil pipeline along the railroad right-of-way, and the historic Brackett Wagon Road located about 200 feet below and generally parallel to the railroad.

The project's 4.2-square-mile drainage basin includes glaciers, moraines, rugged mountainous terrain, and high-gradient streams with cascades and pools. The topography of the region is primarily the result of glaciation about 13,000 years ago.

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The landscape of the project area is made up of forests, mixed with mountain meadows, exposed bedrock and boulders, shrubland communities, meadows, and scattered wetlands. The Tongass National Forest provides habitat for about 54 species of mammals, 231 species of birds, and 5 species of amphibians and reptiles (U.S. Forest Service 1991a, 1991b).

The 943-kilowatt Dewey Lakes Project (FERC No. 1051), located about 1 mile east of Skagway, is the only existing hydropower project in the Skagway region. This project was originally licensed on April 1, 1980, and the license expires on August 29, 2007.

#### 1. Cumulative Impacts

An action may cause cumulative impacts on the environment if its impacts overlap in space and/or time with the impacts of other past, present, and reasonably foreseeable future actions. The individually minor impacts of multiple actions, when added together in space and time, may amount to collectively significant cumulative impacts. The existing environment shows the effects of past and present actions and provides the context for determining the significance of cumulative impacts from future actions.

In SD2, we identified tourism and sightseeing opportunities as two elements that could be cumulatively affected by development of the project in combination with existing and potential development in the area. However, after further analysis, we don't believe there is a potential for these, or other resources to be cumulatively affected. The following is the basis for our conclusion:

— The Clinton Customs Border Station, the Klondike International



Highway, and the WP&YR RR (Figure 1) are the main non-hydropower developments in the Skagway River Valley. Except for other small and isolated structures, there are no other visible human developments in the valley. None of these developments has contributed, nor is expected to contribute, to adverse impacts on tourism and sightseeing opportunities in the area. At this time, there is no known development planned.

— Because of its location in a forested environment, the Dewey Lakes Project is not visible from primary public viewing locations such as the Klondike International Highway, the WP&YR RR, or from the town of Skagway. Visual effects of this development can only be seen from hiking trails that lead to the site from Skagway, or by flying over the project above 500 feet msl elevation. Therefore, the Dewey Lakes Project does not adversely affect tourism and sightseeing opportunities in the valley.

— AP&T proposes site-specific measures to minimize potential adverse effects from project development on the aesthetic quality of the Goat Lake

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Project area (see section VI.B.5.). These measures, which are consistent with the Tongass Land Management Plan, would minimize any impacts to visual resources in the project area; therefore eliminating any impacts to tourism and sightseeing opportunities.

## B. Proposed Action and Action Alternatives

### 1. Geology and Soil Resources

a. Affected Environment: The project area consists of exposed bedrock with talus and alluvium deposits. The slopes range from flat to steep. The steeper slopes have an accumulation of rock debris that has formed fan shaped deposits (talus deposits) at the base of steep-sided cliffs. The less steep slopes are alluvium deposits of sand, gravel, cobbles, and boulders with traces of silt and woody debris. An organic soil (muskeg) is also found in the project area. Muskegs consist of a soft, highly compressible mixture of peat moss, roots, and other vegetation. The talus and alluvium deposits together with muskeg underlain by bedrock, provide a stable area with little chance of erosion or sedimentation. However, occasionally, water streams with high velocities, water from snow melt, snow avalanches, or major landslides could cause this type of material to shift and move causing erosion and sedimentation.

b. Environmental Impacts and Recommendations: Construction of the penstock, powerhouse, catchbasin, siphon house, pumpback/valvehouse and other project features have the potential to cause erosion and sedimentation that would affect water quality.

control  
to control  
measures  
stabilization,  
use  
job sites,  
construction is  
completed.

On March 30, 1995, AP&T submitted a draft erosion and sediment plan (ESCP) that outlined the methods and techniques to be followed construction impacts during land-disturbing activities. These include sediment control ponds, silt fence barriers, streambank and use of rock to construct entrance roads. Also, AP&T proposes to aerial trams and helicopters to transport construction materials to and to revegetate disturbed areas as quickly as possible after construction is completed.

Fish and  
agree that  
project  
(letters  
Service, April  
Fish and

The U.S. Fish and Wildlife Service (FWS), Alaska Department of Game (ADFG), and Alaska Department of Natural Resources (ADNR) all the methods and measures outlined in AP&T's draft ESCP address construction impacts and would ensure maintenance of water quality from Nevin Holmberg, Field Supervisor, U.S. Fish and Wildlife Service, April 17, 1995; John Palmes, Area Habitat Biologist, Alaska Department of

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Game, Douglas, Alaska, April 11, 1995; and William Long, Executive Director, Soil and Water Conservation Board, Alaska Department of Natural Resources, Anchorage, Alaska, May 1, 1995).

The FS concludes that the potential for soil erosion is low and that mitigation for any potential erosion is outlined in the draft ESCP. However, the FS says that under their section 4(e) authority, and granting a SUA, AP&T would have to further develop its draft ESCP. The final plan would be required to comply with the Best Management Practices described in the FS Region 10 Soil and Water Conservation Handbook for this type of construction. Also, under their section 4(e) authority, the FS would require AP&T to develop solid waste, wastewater, and hazardous substance plans before land-disturbing activities.

Staff concludes that the potential for erosion and sedimentation to occur in the project area is low because of the mostly stable slopes. Further, we agree with the agencies that AP&T's draft ESCP outlines methods and measures to be followed during land-disturbing activities that would control construction impacts and protect water quality. However, we also agree with the FS that AP&T needs to develop a final ESCP prior to land-disturbing activities because the draft plan is general and not site-specific enough for construction.

Therefore, we recommend that AP&T develop a final site-specific ESCP using its draft as a basis for the final plan. We further recommend that the final plan include provisions for handling solid waste, wastewater, and hazardous substances. The final plan should be developed in consultation with

the FS, and other agencies, and approved by the FS before it is  
filed for Commission approval.

c. Unavoidable Adverse Impacts: Minor, temporary and  
localized erosion that would cause temporary sedimentation would be unavoidable during  
construction activities.

## 2. Aquatic Resources

a. Affected Environment: The Goat Lake outlet flows through  
a 5-foot- wide, bedrock notch and combines with runoff from the glacial  
moraine to form a shallow pond about 600 feet below the lake. The pond outflow  
descends 2,100 feet over a steep, 30 percent gradient and forms Pitchfork Falls  
before entering the Skagway River.

### Water Quantity

Inflows to Goat Lake result from a combination of  
precipitation and glacial runoff. AP&T used U.S. Geological Survey (USGS) flow data,  
recorded

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to  
proportion  
annual and  
monthly inflows to Goat Lake.

for the Skagway River at the town of Skagway from 1964 through 1986,  
estimate the inflows to Goat Lake by calculating its drainage as a  
of the Skagway River drainage. Table 1 shows the estimated average

Goat Lake,  
Goat  
pond. To  
installed at the  
above  
1991 through  
from glacial  
estimated  
the gage

The glacier, located above a moraine area at the south end of  
is about 1.7 square miles and provides runoff through the moraine to  
Lake, the pond below Goat Lake, and to Pitchfork Falls below the  
develop hydrologic data for the project site, flow gages were  
outlet to Goat Lake, the outlet of the pond below Goat Lake, and  
Pitchfork Falls near the railroad line. The data for water years  
1994 show that about 18 percent of the Pitchfork Falls flows are  
runoff and the remainder from the pond outflow. Table 2 shows the  
average annual and monthly flows in Pitchfork Falls as recorded at  
located at Pitchfork Falls near the railroad line.

1964  
Company

Table 1. Estimated average inflows to Goat Lake for water years  
through 1986 (Source: Alaska Power and Telephone  
1995b).

(cfs)	MONTH	FLOW (cfs)	MONTH	FLOW
35.2	January	0.9	July	
26.1	February	0.7	August	
16.2	March	0.7	September	
9.4	April	1.5	October	

3.4	May	9.9	November
1.1	June	29.9	December

Annual Average 11.3 cfs

Table 2. Estimated average flows for Pitchfork Falls for water years 1991 through 1994 (Source: Alaska Power and Telephone Company 1995b).

1/	MONTH	FLOW (cfs)	1/	MONTH	FLOW (cfs)
36.8	January	2.1		July	
26.8	February	2.1		August	

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19.2	March	2.1	September
10.9	April	1.9	October
2.0	May	15.7	November
2.8	June	42.9	December

Annual Average 13.8 cfs

1/ AP&T developed high and low hydrologic averages by using the average from the gage records as a low estimated average and increasing it by 20 percent to represent a high estimated average. We are using the low estimate as the more realistic average. AP&T provided us with monthly estimated averages only for the high estimate, so we calculated the monthly estimates for Table 2 by applying the corresponding monthly percents of the high annual average to the low annual average.

#### Water Quality

Water quality in the proposed project area complies with applicable state standards. AP&T conducted water quality studies during August 1992, March and July 1994, and January and March 1995. Water samples for the study were collected from the surface of Goat Lake, 25 feet below the lake surface, and from the Skagway River above and below the outlet of Pitchfork Falls.

Dissolved oxygen levels ranged from 7.1 milligrams per liter (mg/l) to 12.2 mg/l in Goat Lake and from 8.2 mg/l to 9.8 mg/l in the Skagway River. Turbidity levels ranged from 1.49 nephelometric turbidity units (NTU's) to 9.11 NTU's in Goat Lake and from 0.47 NTU's to 44.2 NTU's in the Skagway River. The pH levels ranged from 6.8 to 7.25 in Goat Lake and from 7.11 to 7.51 in the Skagway River. Conductivity levels ranged from 35 microsiemens per centimeter (µS/cm) to 54.6 µS/cm in Goat Lake and from 23 µS/cm to 64.2 µS/cm in the Skagway River.

Temperature profiles were developed for Goat Lake in August



1992, July 1994, and March 1995. The temperatures in Goat Lake ranged from 0.0o Celsius (C) to 5.5oC with no significant thermal stratification in any single profile.

Fisheries

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In April 1994, AP&T and the ADFG conducted a fish survey in the Skagway River upstream and downstream of the Pitchfork Falls outlet. During the survey, no fish were captured or observed. The survey report showed that existing habitat conditions are extremely poor because of the high gradient and lack of overwintering and rearing habitats. The survey results indicate that this section of the Skagway River does not support any significant fish populations (Alaska Power and Telephone Company 1995b).

Goat Lake is a coldwater, nutrient-poor lake that historically has not supported fish populations. The ADFG and the FS recently conducted an experimental stocking of Arctic grayling in Goat Lake in an effort to establish a naturally reproducing fish population that would support a fly-in sport fishery. The ADFG stocked the lake with 1,000 immature Arctic grayling in 1994 and 1995; however, a fishery survey conducted after the 1995 stocking found no surviving population (personal communication with Mike Schwan, Supervisor, and John Palmes, Area Wildlife Biologist, Alaska Department of Fish and Game, Juneau, Alaska, November 8, 1995).

b. Environmental Impacts and Recommendations:

Water Rights

AP&T has applied to the ADNR for the right to withdraw up to 45 cfs from Goat Lake for hydroelectric power use. There are no existing allocations of water from Goat Lake or the Skagway River for consumptive or non-consumptive uses, so no other water users would be affected by the project.

Fisheries

In SD 2, we identified one aquatic resource issue for analysis:

"Whether project drawdowns would limit Arctic grayling access to spawning streams entering Goat Lake, should a population become successfully established."

During the scoping process we received comments on this issue from the FS, the ADFG, and AP&T. The commenters stated that the effects of a 20- to 30-foot drawdown on the entrances to the spawning streams would not be known until after the areas were exposed (Ann Riley and Associates 1995a, 1995b). Based on

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the findings of the ADFG survey conducted after the June 1995 stocking, we have concluded that no Arctic grayling population has established in Goat Lake, eliminating any potential project effects.

c. Unavoidable Adverse Impacts: None

### 3. Terrestrial Resources

a. Affected Environment: The project area contains a variety of resource habitats: mountain meadows, shrubland communities, herbaceous-sedge meadows, avalanche chutes, bare bedrock and bedrock supporting lichens, open montane coniferous forest, scattered wet-sedge meadows, muskegs, alpine heaths, and sedge mats (letter from Mary Clay Stensvold, Regional Botanist, U.S. Forest Service, Sitka Ranger District, Sitka, Alaska, April 29, 1994). The dominant trees are subalpine fir, Sitka spruce, western hemlock, paper birch, and cottonwood while the understory shrubs are dominated by Sitka alder, rusty menziesia, black current, tall blueberry, devil's club, shield fern, crowberry and mountain heather. Herbaceous vegetation include ferns, bunchberry, mosses, five-leaf bramble, twayblade, and Sitka valerian. According to the national wetland inventory, the project area has seven wetland types that are listed on Table 3.

The project area has varied and unique wildlife, which provides consumptive and nonconsumptive uses by the public, including sport, subsistence, photographic, and viewing activities. Some of the wildlife are black bear, pine marten, mountain goat, river otter, hairy woodpecker, and boreal owl.

Among large birds in the project vicinity is the bald eagle, which is not federally threatened in Alaska as it is in the conterminous United States. During the summer of 1993, there were three known nests near Skagway; two are west of town and the third is in the lower reach of the Taiya Inlet (letter from Mike Jacobson, Eagle Management Specialist, U.S. Fish and Wildlife Service, Juneau, Alaska, September 29, 1993). Bald eagles frequent the Skagway River. Reportedly, as many as 90 eagles have been observed near the head of Taiya Inlet in early spring when spawning candlefish arrive.

Table 3. Wetlands in the project area (Source: Alaska Power and Telephone Company 1995b).

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LOCATION		NO.	DESCRIPTION	NAME OF
project	Wetland-			WETLAND
principle	1	Lacustrine, limnetic,	Goat Lake	head of
source of		unconsolidated,		area;
		permanently flooded		water
		system		project
water from	Wetland-	Riverine, intermittent	Pitchfork Falls	conveys
to	2	seasonally flooded		Goat Lake
River		streambed		Skagway
2,400 feet	Wetland-	Palustrine, scrub-shrub,	unnamed	about
penstock;	3	broad-leaved deciduous		SSW of the
facing				proposed
				on west-
project;	Wetland-	Riverine, upper	Skagway River	slope
	4	perennial, unconsolidated		bottom of
into		bottom		tailrace
				discharges
				directly
				river
4,800 feet N	Wetland-	Palustrine,	unnamed	about
Pitchfork Falls	5	unconsolidated,		of
1,200		semipermanently flooded		and about
of Goat				feet west
				Lake
1,800 feet	Wetland-	Palustrine,		about
Goat Lake	6	unconsolidated,	these two	NNE of

		permanently flooded	unnamed wetland sites are in	about
1,800 feet				
Goat Lake		Palustrine, unconsolidated, semipermanently flooded	same area	NNE of
	Wetland-			
6,000 feet		Palustrine emergent,	unnamed	about
	7	persistent, seasonally		NNE from
Goat Lake		flooded		

Bald eagles have not been seen at Goat Lake or Pitchfork Falls, probably because of the absence of fish, which is the principal component of their diet. No other raptor nest sites are known in the Goat Lake area. Other large birds that may

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periodically use the project area, in small numbers, are the great blue heron, trumpeter swan, and perhaps Canada goose and sandhill crane.

Surveys indicate that mountain goat use in the area surrounding Goat Lake is minimal (memorandum from Ben Carney, Wildlife Biologist, Alaska Department of Fish and Game, Douglas, Alaska, November 20, 1995). Only two individuals were observed during seven surveys between 1973 and 1994 in the project area. Most of the goats in the project vicinity were near Laughton Glacier, on south-facing slopes along the East Fork of the Skagway River, or on west-facing areas above Goat Lake (letter from Matt Robus, Area Management Biologist, Alaska Department of Fish and Game, Douglas, Alaska, January 27, 1994). A low use mountain goat winter area was identified on the west side of the Skagway River Valley in 1973 (memorandum from John Palmes, Regional Habitat Coordinator, Alaska Department of Fish and Game, Douglas, Alaska, April 9, 1973).

A habitat capability model was developed to estimate the capability of habitats in southeast Alaska to support mountain goat populations (Suring et al. 1988). Since wintering habitat is the most limiting factor for mountain goats in southeast Alaska, particularly due to heavy snows and limited access to desired forage, wintering habitat was emphasized in the model. The important components affecting winter habitat suitability and capability in the model were availability of wintering food, escape terrain, distance of use from cliffs, southerly aspects, general slope characteristics, successional stage of vegetation, tree canopy, mobility corridors, predation, human disturbance and harvest (U.S. Forest Service and Bureau of Land Management 1995; Alaska Department of Highways 1973). As a result, predicted goat use areas were plotted and the closest suitable habitat was about 1,400 feet northeast of Goat Lake at elevation 3,150 feet msl, and about 2,000 feet due south of the lake at elevation 3,500 feet msl. Based on physical attributes of the Goat Lake basin, the project area is not expected to be a kidding area.

b. Environmental Impacts and Recommendations:

Habitat Disturbance

Project construction of the valvehouse, new spillway, siphon house, penstock, powerhouse, transmission line, access road, and tramway would physically disturb an estimated 9.25 acres of



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native soils, vegetation, and habitat used by wildlife. To partially offset these losses and minimize disturbance and alteration to these affected resources, AP&T proposes to: (1) leave as much vegetation as possible during powerhouse and penstock construction; (2) revegetate disturbed areas as soon as possible after disturbance, (3) follow FS guidelines for revegetating disturbed areas; (4) use a helicopter or donkey-winch to transport the penstock to its location to protect as much natural vegetation as possible; and (5) design the penstock to avoid interference with wildlife movements. These measures have largely resulted through agency consultation during the preapplication stage.

Staff believes implementation of these measures would minimize, protect, or avoid adverse effects on terrestrial resources in the project area. Staff, therefore, recommends that the proposed terrestrial resource protection and mitigation measures should be implemented to ensure conservation of these resources.

#### Wetlands/Riparian

Construction of the new spill route, diversion structure, penstock, tailrace, pumpback house, siphon house, and backfilling of the old channel outlet would affect less than 1.0 acre of small, isolated alpine heaths, sedge-grass meadows, sedge mats, and alpine herbaceous meadows having saturated soils and wetland characteristics. The selected site for the powerhouse and substation is about 1,600 feet downriver and on the east side of the Skagway River from the confluence of Pitchfork Falls with the Skagway River.

On March 16, 1995, the FS agreed that the wetlands and riparian habitats were not in direct conflict with the project features and that unavoidable incidental impacts to wetland habitats would be minor.

We find that since AP&T: (1) has designed the project features to avoid the project area wetlands as much as possible, (2) would avoid effects on wetlands during construction as much as possible, as outlined in the application, and (3) would revegetate disturbed areas as quickly as possible after construction, as outlined in the draft ESCP and recommended in

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the final ESCP (section VI.B.1.), all reasonable efforts would be made to minimize wetland impacts and protect water quality.

#### Raptor Protection of Transmission Line

##### a. Electrocution

AP&T proposes to construct a 3,400-foot-long, 24.9-kV aerial transmission line. The alignment would start at the substation, cross the Skagway River, continue downgradient and parallel along the west side of the Skagway River near Clinton, and then traverse upslope to the Customs Border Station to intertie with AP&T's existing 24.9-kV transmission line to Skagway. The entire west side of the river is state land.

Because the transmission line could represent an electrocution hazard to bald eagles and other large birds in the area, AP&T plans to design and construct the line to prevent possible long-term hazards to raptors and other large birds. Accordingly, AP&T would construct the line to meet or exceed the Suggested Practices for Raptor Protection on Power Lines - The State of the Art in 1981 (Olendorff et al. 1981). In particular, the energized conductors would be positioned far enough apart (minimum separation of 60 inches) that large birds would be unable to simultaneously touch two or more of them with their wings or other body parts.

In their March 15, 1995, response, the FWS and FS concurred with AP&T's raptor protection measures on the transmission line.

According to Olendorff et al. (1981), transmission lines less than 69 kV could pose an electrocution hazard to birds because of birds' bodily contact with energized conductors. While we recognize that the project area appears to have only incidental occurrences of bald eagles and other large birds, we nevertheless agree with AP&T's long-term measures to safeguard against any possible electrocution to bald eagles and other large birds.

##### b. Collision

Due to the absence of eagle nest sites, communal roosts, and endangered raptors in the project area, AP&T doesn't propose collision avoidance measures on the transmission line. In areas of high fog, strong electrical and rain storms, and other climatic conditions, it is possible that transmission lines could

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pose collision hazards to small and large birds, including eagles. There are no recommended agency measures to prevent collision hazards.

A literature review shows that raptor collisions with transmission lines are random, low level, and inconsequential. Eagles have keen eyesight, use relatively slow flapping flight speed, and become conditioned to the presence of transmission lines (Olendorff and Lehman 1986).

We agree with AP&T that no collision measures are needed because of the following: (1) large bird populations in the project area are very low in numbers, and (2) it doesn't seem likely that bird strikes with power lines would contribute to substantial bird losses in the project area. We therefore conclude that the overhead transmission line, as proposed, is consistent with accepted protection guidelines that would prevent electrocution hazards to large birds. Therefore, AP&T should construct the transmission line as proposed.

#### Mountain Goats

Chadwick (1983) reports that mountain goat populations have experienced significant declines following habitat alterations and disturbance from hunting and other human activities. In particular, this species is more sensitive to disturbances than any other big game species in North America. The project area has no road access and limited human use.

Project construction would likely cause localized noise and disturbance from helicopter and machinery use; however, the noise is not expected to last long, nor be offensive to normal mountain goat activities during the spring and summer months. Because Goat Lake does not appear to provide important summer or winter mountain goat habitat, this species is not likely to be significantly affected by construction or maintenance activities associated with the project. The ADFG agrees (memorandum from Ben Carney, Wildlife Biologist, Alaska Department of Fish and Game, Douglas, Alaska, November 20, 1995; letter from Matt Robus, Area Management Biologist, Alaska Department of Fish and Game, Douglas, Alaska, January 27, 1994; memorandum from John Palmes, Area Habitat Biologist, Alaska Department of Fish and Game, Douglas, Alaska, November 22, 1995).

Nevertheless, to minimize any potential adverse effects on goat mating or kidding during project construction, AP&T proposes

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to adjust the construction schedule, through coordination with the FS and ADFG, to avoid possible disturbance during the mating and kidding periods. Therefore, we agree with AP&T's proposed protection measure and recommend this protection measure be included in any license issued for the project. To further ensure that wildlife, including goats, are not affected by helicopter activity in the project area, the FS is including in their required section 4(e) conditions, that AP&T file a wildlife habitat plan having the same requirements for minimum distances from wildlife that is required for helicopter tours. This includes maintaining a 1,500-foot vertical and horizontal clearance between helicopters and key goat areas, avoiding known kidding areas from May 15 through June 15, and avoiding harassment of wildlife in any way.

c. Unavoidable Adverse Impacts: Project construction is expected to alter about 9.25 acres of wildlife habitat and existing landscape resources that include shrublands, open montane coniferous stands, herbaceous-sedge meadows, bedrock supporting lichens, avalanche chutes, muskegs, and alpine heaths and sedge mats.

About one acre of wetland would be affected by project construction, particularly for establishing the penstock.

Use of a helicopter and other equipment during project construction would increase noise in the project area, which could cause temporary dispersal and relocation of wildlife. It is expected that this short-term noise would occur only during the construction season. Because of their preferred habitat away from Goat Lake, it is unlikely that mountain goats would be affected by the project.

#### 4. Threatened and Endangered Species

a. Affected Environment: The FS conducted an extensive plant survey of the project area on July 27, 1993. The survey area included: (1) the proposed penstock corridor from the intake at the lake downgradient to the top of Pitchfork Falls, (2) the existing outlet at the lake to the top of Pitchfork Falls, (3) the subalpine meadow/montane forest mosaic in the general project area, (4) the lower part of the moraine, and (5) montane forest in the Pitchfork Falls vicinity. Only one of the 22 plants



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designated as sensitive by the FS Regional Forester was located.<sup>17/</sup> This plant, the goose-grass sedge (*Carex lenticularis* var. *dolia*), is also a species of special concern by the FWS. There are no other listed plants by the FWS in the project area that are threatened, endangered, candidate or species of special concern.

The FWS states that the following federally-listed animal species may occur in the proposed project area as transients, particularly during seasonal migration: endangered American peregrine falcon and Arctic peregrine falcon <sup>18/</sup> (letter from Nevin D. Holmberg, Field Supervisor, U.S. Fish and Wildlife Service, Juneau, Alaska, August 21, 1992; personal communication, John Lindell, Endangered Species Biologist, U.S. Fish and Wildlife Service, Juneau, Alaska, November 21, 1995). Additionally, there are four FWS species of special concern that may occur in the project area: marbled murrelet, northern goshawk, harlequin duck, and spotted frog (U.S. Fish and Wildlife Service 1994).

#### Goose-Grass Sedge

The first known Alaska collection of the *Carex lenticularis* var. *dolia* was in 1913 near Skagway, and its main geographic range in Alaska is the southeast panhandle south to Queen Charlotte Island. There are also widely disjunct populations in the Yukon Territory, British Columbia, Alberta, and Glacier National Park in Montana, its southernmost limit.

Although there have been few individuals collected, this plant seems to prefer high mountain elevations (5,000 to 9,800 feet msl), at high latitudes from timberline to the alpine, and almost always in or at the water's edge (Standley 1985). The

17/ FS sensitive plant species are those for which population viability is a concern, as evidenced by (a) significant current or predicted downward trends in populations numbers or density, and (b) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

18/ Although the Arctic peregrine falcon was delisted on October 5, 1994 (Federal Register Vol. 59, No. 192, pp. 50796-50805) and is no longer

protected under the Endangered Species Act, the FWS must monitor  
this species for 5 years following its delisting. Federal agencies are requested  
to voluntarily consider the Arctic peregrine falcon in their planning  
processes.

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goose-grass sedge appears to be an early successional species, colonizing shallow, wet, organic loamy soils along streams and in seep areas of gentle terrain. The soils are usually very shallow and have a high content of stones and gravel. Surrounding vegetation is usually moist meadows or tundra. In some areas it may be one of the first plants to stabilize stream banks and wet, slumping soils of high elevation terraces.

A FS plant survey of the project area revealed that the goose-grass sedge was found above the east side of Goat Lake at about 4,000 feet msl, outside the project area (letter from Mary Clay Stensvold, Regional Botanist, U.S. Forest Service, Sitka Ranger District, Sitka, Alaska, April 29, 1994).

#### American Peregrine Falcon

In Alaska, the American peregrine falcon (*Falcon peregrinus anatum*) primarily inhabits interior portions of the state. It is highly migratory and winters as far south as Argentina. Although this species may occur in the project area as a transient, primarily during seasonal migration, there has been no reported observation in the vicinity of the project. Migration routes and patterns and forage areas haven't been identified.

During migration across southeast Alaska, availability and abundance of prey most likely determines the birds' flight patterns and stopover areas. About 82 percent of the food consumed by the American peregrine are vertebrates, and the primary prey in Alaska consists of shorebirds, waterfowl, and passerine birds (U.S. Forest Service 1991b). Peregrines forage over bodies of water, marshes, grasslands, shorelines, and over wooded areas and they attack flying prey from above or by chasing them.

Data suggests that the American peregrine populations have recovered as a result of restrictions on organochlorine pesticide use (especially DDT and DDE) in the United States and Canada, and because of successful reintroduction from captive-bred species. In nature, these chemicals have caused eggshell thinning and poor reproductive success among peregrine falcons. No organochlorine pesticides are authorized for use on the Tongass National Forest (U.S. Forest Service 1991a, 1991b). According to Ambrose et al. (1988), American peregrine populations in Alaska are continuing

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to increase. Therefore, the FWS proposes to remove this species from the list of threatened and endangered wildlife and the critical habitat designation (U.S. Fish and Wildlife Service 1995).

#### Arctic Peregrine Falcon

As with the American peregrine, the Arctic peregrine falcon (*Falcon peregrinus tundrius*) populations declined following World War II as a result of organochlorine pesticides use. After 20 years of restriction on the use of these chemicals marked by steady progress toward recovery, reproductive rates in arctic peregrines have steadily increased, and populations continue to rise. About 250 pairs nest in Alaska and thousands nest throughout arctic North America. There has been no reported observation of the Arctic peregrine falcon in the project vicinity.

Arctic peregrines nest in tundra regions of Alaska, Canada, and Greenland and migrate through mid North American latitudes and winter in Latin America. Arctic peregrines occur in southeast Alaska only during the migration periods (U.S. Forest Service 1991b). In Alaska, this subspecies nests mostly along rivers in the northern and western parts of the state. Nests are positioned on cliffs or bluffs usually near rivers or lakes that provide habitat for shorebirds, waterfowl, and songbirds on which the falcons prey.

Although the rate of habitat alteration in nesting, migration, and wintering habitats is greater now than in the past, the rapid population increase over the last 15 years (Ambrose et al. 1988) suggests that habitat modification does not threaten the continued existence of this species.

#### Marbled Murrelet

The marbled murrelet is regarded as a bird of mystery because its nesting habits are largely unknown and its nearshore feeding habits make it difficult to survey. This small seabird spends most of its time along coastal areas from Alaska to central California and feeds primarily on small Pacific herring, northern anchovies, Pacific sandlances, sea perch, and invertebrates in near-shore marine waters (Federal Register Vol.60, No.154, pp.40892-40908, August 10, 1995). Throughout forested portions of its range, such as in the Alexander Archipelago in which the project lies, the marbled murrelet nests

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in mature and old-growth coniferous forests located mostly within 38 miles (60 km) from marine coastal waters. Those murrelet populations in the more westerly Aleutian and Kenai Peninsula Archipelagos generally nest on the ground. Tree nesting murrelets select large diameter, old-growth healthy or decadent trees more than 100 feet above the ground often having mistletoe, deformations, and moss on large limbs (Pacific Seabird Group 1995, Kuletz et al. 1994).

Marbled murrelet population numbers are thought to be declining in the lower forty-eight. The greatest threat to murrelets is nesting habitat loss and modification due to logging, development, and fragmentation of nesting stands (Federal Register Vol.65, No. 119., pp. 28362-28367, June 20, 1991, Pacific Seabird Group 1995). Estimated population numbers are higher in Alaska (50,000-220,000) than in British Columbia, Washington, Oregon, and California combined (32,000-71,900).

#### Northern Goshawk

The largest of the accipiter hawks, the northern goshawk has a wide geographic breeding range in North America and, in Alaska, it inhabits and breeds in the central and eastern portions of the state (Johnsgard 1990). It winters throughout its breeding range and extends as far south as northern Mexico and Texas. Primarily in April and May, goshawks nest in nearly every kind of coniferous forest, but also use deciduous and mixed woodlands (Apfelbaum and Seelbach 1983). McGowan (1975) found that goshawks in interior Alaska selected paper birch for nesting 94 percent of the time where suitable nest-tree species were present. Generally, nest sites are in old, tall trees having a well-developed understory and are near a water source of moderate slope, usually having a northerly aspect. Large forest stands are favored and there is a great deal of variation in population density throughout its Holarctic range.

The northern goshawk is associated with diverse habitats such as dense coniferous taiga with scattered glade, tall conifers mixed with deciduous woods, river forests, and cultivated coniferous plantations, and stands of birch, aspen, pine in steppe or woodlands. Coniferous forests are preferred over deciduous. The bird shows a lower habitat specificity in the winter often ranging into other habitats, including deserts. In the project area, the northern goshawk is known only as a transient.



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All studies have shown that there is a high dependency on birds and mammals of moderate to large size in the goshawk diet (Sherrod 1978). Important prey base for the goshawk are Stellar's jays, grouse, ptarmigan, thrushes, and mid-sized furbearers. Goshawks have not been abundant in southeast Alaska but because they are associated with forested landscapes, they are vulnerable to habitat loss from land disturbance.

#### Harlequin Duck

In selected areas of its range, such as the Aleutian Islands and parts of British Columbia, the harlequin duck is abundant. But because much of their worldwide range lies in remote regions, accurate populations and distribution has been difficult to determine.

The western populations of harlequins are primarily in Alaska, particularly in the Aleutians, Alexander Archipelago, and the Alaska Peninsula. The Aleutian Islands are considered to be "a center of abundance" for the Pacific harlequin ducks (Palmer 1976). In May, adults leave their wintering areas along coasts for interior breeding grounds. Their breeding distribution extends from northern Alaska to Washington state where the distribution splits southward to the Cascade range and southeasterly to the northern Rocky Mountains. Harlequins have also been observed during the summer on islands in the Bering Sea and Pribilofs.

Harlequins usually nest along rocky shores adjacent to rapids of turbulent mountain streams. In Alaska's eastern Prince William Sound, harlequins selected the largest anadromous salmon streams for nesting (Crowley 1993). The nests were located along first order tributaries near timberline, on steep southwest-facing slopes, and positioned beneath old growth forests. Well concealed nests are generally composed of a thin layer of grass, with dry twigs and leaves, and lined with down. Females incubate assiduously and appear to have a high degree of fidelity when nesting.

In search of food, harlequins can dive to depths of 5 feet in swift currents. Most of their preferred foods are animal material such as crustaceans (mud crabs, hermit crabs, amphipods), mollusks (chitons, periwinkles, limpets, chink shells, blue mussels), insects (stone flies), worms, and fish.

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The harlequin duck is thought to occasionally move through the Skagway River Valley in individual or low numbers.

#### Spotted Frog

The distribution and population status of the spotted frog in Alaska is unknown. The historical range extended from extreme southeastern Alaska south to central Nevada and east to northwestern Wyoming. The specific reasons for its decline are unknown but researchers speculate the following principle causes: (1) habitat loss due to encroachment by man, (2) climatic changes, including droughts, (3) lake acidification as a consequence of climate change or succession, (4) increased UV-B radiation due to ozone depletion, and (5) competition with introduced species such as bullfrogs (Blaustein et al. 1995; Waters 1992; Hayes and Jennings 1986).

The spotted frog habitats range from coniferous northwest forests to semiarid sagebrush sites. Generally the spotted frog is highly aquatic, always found near permanent water and adjacent grassy margins of lakes, streams, and ponds. It is suggested that this elusive species is more common in cold water habitats than in warm, stagnant ponds. In the Stiking River basin near Wrangell, south of Juneau, they were observed breeding in outwash ponds and in a backwater lake, with possible breeding in muskegs and beaver ponds (Waters 1992). This frog is not an old-growth obligate, but forested areas may represent important refugia from further population losses (Blaustein et al. 1995). This species has been reported in the Haines area (located about 40 miles south of the proposed project site), but has yet to be verified by the FWS.

b. Environmental Impacts and Recommendations: The Goat Lake Project would not adversely affect the federally endangered American peregrine falcon or delisted Arctic peregrine falcon because: (1) both peregrine falcon species are thought to occur in the project area only in small numbers and as occasional migrants; (2) critical habitat for both peregrine species are not known to occur in the project area; (3) preferred prey (shorebirds and waterfowl) are not abundant in the project area, so foraging would not be affected; and (4) the alteration of about 10 acres of forest, shrubland, and muskeg habitats would not affect prey availability for migrating peregrines nor important foraging habitats such as wetlands, ponds, and riparian zones.

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We also conclude that the project would not adversely affect the five species of special concern that could occur in the project area for the following reasons: (1) these species have not been found in the project area; (2) the goose-grass sedge was found at the 4,000 foot msl elevation, outside the project's impact area; (3) the project area does not have preferred old growth and mature coniferous habitat for marbled murrelet nesting nor is such habitat known in the Skagway River Valley; (4) populations of the northern goshawk, harlequin duck, and spotted frog that could inhabit the area are likely to be low; (5) the project area is not known to support high populations nor provide known critical habitat for the northern goshawk, harlequin duck, and spotted frog; (6) project construction is not expected to affect nesting or movements of the northern goshawk, harlequin duck, and spotted frog; (7) because Goat Lake is a nutrient-poor lake with low bioproductivity, it is not probable that Pitchfork Falls, which receives water from Goat Lake, sustains a suitable food base (aquatic invertebrate diversity and numbers) for the harlequin duck; (8) construction of various project features (intake, siphon house, pumpback valve house, penstock, powerhouse/substation, transmission line) are not likely to be sited in desired nesting habitats of northern goshawk, harlequin duck, and spotted frog; and (9) since the project is located about 250 miles north of the known limits of the western spotted frog, it is not likely that this species can be found in the project area.

Therefore, we think that the project would not affect the endangered American peregrine falcon and that no further action pursuant to Section 7 of the Endangered Species Act of 1973, as amended, is required. By letter dated March 25, 1996, the FWS concurred with our determination (letter from Nevin D. Holmberg, Field Supervisor, U.S. Fish and Wildlife Service, Juneau, Alaska, March 25, 1996). We also find that project construction and operation would not affect the delisted Arctic peregrine falcon, and the five species of special concern: goose-grass sedge, marbled murrelet, northern goshawk, harlequin duck, and spotted frog.

c. Unavoidable Adverse Impacts: None

#### 5. Aesthetic Resources

a. Affected Environment: The proposed project is located in the Coast Range of southeast Alaska. The Skagway River Valley is characteristic of the region, with its narrow U-shaped valley

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with glaciers hanging from the surrounding mountain peaks. The lower elevations are densely forested. The higher areas are mostly exposed bedrock. There are many lakes, streams, and rivers throughout the region. Goat Lake is a typical glacier fed lake located in a steep, hanging valley comprised of bedrock and very little vegetation of significant size. The lake is difficult to get to, except by floatplane or helicopter, or hikers who do not need an established trail.

The Skagway River is the most prominent of the region's waterforms. Pitchfork Falls, a long cascading series of waterfalls that descends into the Skagway River, is the most prominent of the many streams that cascade down the valley's walls. The falls, along with most of the Skagway River Valley, is visible from the turnouts on the Klondike International Highway and from the WP&YR RR.

The lower part of Pitchfork Falls can be accessed by the WP&YR RR as it passes through the project area. The lower- and mid-level of the project area, which includes Pitchfork Falls, where the penstock, powerhouse, tram, and transmission line would be located, is visible from the Klondike International Highway, on the opposite side of the river and from the WP&YR RR. There are several overlooks along the highway where tourists stop and view the Skagway River corridor, which includes the project area.

b. Environmental Impacts and Recommendations: Constructing and operating the project would affect the aesthetic quality of the project area. The impacts would result from constructing new structures in a relatively undeveloped area and reducing flows over Pitchfork Falls from project operations.

#### Effect of Project Facilities on Aesthetic Resources

The penstock, which would be located in dense forested vegetation except where it crosses an avalanche area, should not significantly detract from the aesthetic quality of the area. The powerhouse and substation, located about 1,600 feet downriver from the confluence of Pitchfork Falls with the Skagway River, would also be located in dense vegetation. Although the structures would be visible from the highway overlooks, they would only be partially visible because of the screening from the vegetation. The transmission line and cable\tram would be mostly screened from view by vegetation, but would be visible where they cross the river.



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Goat Lake is in the flight path for visitors touring the area by helicopter. The FS completed an EA, dated May 16, 1995, to assess the effects of helicopter landing tours in the Skagway and Haines area. The selected alternative for authorized helicopter landings includes flying over Goat Lake to access a landing site on Laughton Glacier. The passengers would be able to view the reduced lake level and some project facilities, such as the siphon house and pumpback/valve station. This would not be a significant impact as the facilities should not be readily apparent and the exposed bedrock shoreline would appear similar to the surrounding terrain.

Project construction would also cause increased traffic, noise, and dust levels that would temporarily and locally affect visual quality to the project area.

AP&T has proposed using construction methods that would minimize the impacts of the facilities on the aesthetic quality of the area. These are: (1) using materials and coloration so that the structures blend into the landscape; (2) minimizing clearing of existing vegetation and ground disturbance for construction of the penstock, powerhouse and substation; (3) removing spoil material; (4) revegetating areas disturbed during construction; (5) and providing access to the powerhouse site by a cable\tram river crossing. The FS, by letter dated February 14, 1995, agreed with these methods and recommended that the applicant develop a visual resource management plan that would provide further details of these specific measures. The staff agrees with the FS that the erosion control and terrestrial resource measures (revegetate disturbed areas, minimizing vegetative disturbance) proposed by AP&T would assist to effectively maintain the aesthetic quality of the project area.

Therefore, after consultation with the FS, AP&T should file a visual resource management plan to specify the exterior treatment of project facilities, clearing of vegetation, and revegetating disturbed areas. The plan should be developed in conjunction with the erosion and sediment control plan discussed in section VI.B.1., the terrestrial resource measures in section VI.B.3., and the MOA cultural resources management plan in section VI.B.6.

Effect of Reduced Flows on Aesthetic Quality of Pitchfork Falls

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Pitchfork Falls is a scenic attraction that contributes to the aesthetic quality of the area. It is the focus of viewers from the highway overlooks and from the railcars that pass by the falls. Pitchfork Falls is also mentioned in publications describing the area attractions. Project operation would reduce flows over Pitchfork Falls that could affect the aesthetic quality of the falls.

AP&T and the FS, with assistance from a Visual Impact Analysis prepared by Land Design North (1994), studied different flow alternatives. Reduction of flow would have various levels of impact depending on the selected alternative. By letter dated July 20, 1995, the FS determined that a minimum flow of 13 cfs would maintain the aesthetic quality of the falls. The FS also determined that maintaining the flow would only be necessary during 12 daylight hours per day, from May through September, the peak tourist season (see section VI.B.7.). AP&T, by additional information filed May 30, 1995, agreed to the minimum flow. Project operation from October through April would substantially reduce flows over the falls. However, this is not the time of the year when many tourists visit the area. Therefore, the effects would not be substantial.

We agree that a minimum flow of 13 cfs over Pitchfork Falls, during 12 daylight hours per day from May through September would maintain the aesthetic quality and visual character of the falls and Skagway River Valley. To ensure compliance with this minimum flow recommendation, AP&T proposes installation of an automatically operated, priority stream flow device to measure and record flows, and to operate the bypass or intake gate to maintain required instream flows. We agree that a stream flow gauge should be electronically interconnected to the bypass and intake gate to ensure minimum flow releases. Due to the variable flows and relatively remote location of the site, an automatically controlled device would be necessary to ensure compliance with the minimum flow requirement. Staff believes that installation of a continuously-recording stream gauge upstream of Pitchfork Falls, and a stage-discharge chart would accurately measure the bypass flow.

Therefore, after consultation with the FS, AP&T should file a plan to maintain minimum instream flows. The plan should specify measures the applicant would implement to ensure the minimum 13 cfs bypass instream flow is provided for 12 daylight hours per day, such as use of the priority flow bypass device.

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c. Unavoidable Adverse Impacts: The presence of new structures in a relatively undeveloped area would detract from the undisturbed nature of the Goat Lake basin and to a lesser degree the Skagway River corridor. Operations of the project would marginally reduce flows over Pitchfork Falls from May through September, and substantially during October through April. Constructing the facilities would result in increased traffic, noise, and dust levels that would temporarily affect the natural visual quality of the area.

## 6. Cultural Resources

a. Affected Environment: AP&T conducted a cultural resources survey of the project area (Campbell 1994) . The survey identified the following cultural resources in the project area: (1) contributing elements of the Historic Landmark, that specifically include the WP&YR RR, a historic tourist trail and viewpoint of Pitchfork Falls, the historic Brackett Wagon Road, and a historic telegraph or telephone line dating from World War II and possibly earlier; and (2) the historic Canadian Oil pipeline dating from World War II. No other cultural resources were located.

The Historic Landmark was established on June 13, 1962, and is listed in the National Register of Historic Places. The Historic Landmark was established to preserve and interpret historical structures and other features of the Skagway area and the White Pass Trail, to the northeast, relating to the Klondike Gold Rush in the late 1890's and early 1900's (National Park Service 1987). Some of the features of the Historic Landmark, such as the historic trail and railroad, contribute to the current tourist industry. Other features relate to historic events, such as the telephone line along that railroad route, which illustrates the military effort in the Skagway-White Pass area during World War II.

The historic Canadian Oil pipeline is eligible for inclusion in the National Register and has been documented in accordance with the standards of the Historic American Engineering Record. The pipeline was constructed in 1943 and is significant as an example of the World War II military effort in the area and as an early means of transporting crude oil from coastal Alaska to the interior of Canada.

The Alaska State Historic Preservation Officer (SHPO), the NPS, the FS, and the Klondike Gold Rush National Historic Park

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(NPS-Klondike Park) concur that the survey is adequate for identifying cultural resources in the project area (letters from Judith E. Bittner, State Historic Preservation Officer, Alaska Department of Natural Resources, Anchorage, Alaska, February 7, 1995; Sandra Faulkner, Regional Historian, National Park Service, Alaska Regional Office, Anchorage, Alaska, February 9, 1995; Clay Alderson, Superintendent, Klondike Gold Rush National Park, Skagway, Alaska, February 24, 1995; and Karen S. Iwamoto, Forest Archeologist, Tongass National Forest, Sitka, Alaska, March 6, 1995). We concur.

b. Environmental Impacts and Recommendations: The project may affect the historical integrity of the Brackett Wagon Road, the railroad bed, and the historic Canadian Oil pipeline. The proposed penstock would be routed through a culvert constructed under the railroad bed and the Canadian Oil pipeline. The powerhouse tailrace would be constructed to cross under the Brackett Wagon Road. These construction activities could potentially alter the physical and visual character of these sites. There would be no effect on the historic trail and viewing area, and the historic telephone line. The project is not located in the immediate vicinity of the trail and viewing area, and the historic telephone line is not located in the vicinity of the project facilities.

AP&T proposes to conduct additional work to assess the effects of the project on cultural resources and to implement a cultural resources management plan to protect contributing elements of the Historic Landmark affected or potentially affected by the project, pursuant to an MOA prepared in accordance with the Advisory Council's regulations (36 CFR 800) for the National Historic Preservation Act. After review and revisions, the MOA has been accepted and signed by the SHPO, the FS, the NPS-Klondike Park, the NPS, and AP&T.

AP&T consulted the Skagua Traditional Village Council, representative of the local Native American tribe, and requested the Village Council to be a party and signatory to the MOA. The Village Council declined and said they have no concerns about traditional uses of the area (letters from Pete Johnson, Representative, Skagua Traditional Village Council, Skagway, Alaska, April 11, 1995; and Silas H. Dennis, Jr., Member-at-Large, Skagua Traditional Village Council, Skagway, Alaska, April 12, 1995). The FS has stated that the intent of the Advisory Council's regulations concerning Native American consultation [36 CFR 800(1)(c)(iii)] has been satisfied for the project (letter



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from Karen S. Iwamoto, Forest Archeologist, Tongass National Forest, Sitka, Alaska, April 20, 1995). The NPS has said AP&T has made a reasonable effort to consult the Village Council and to include the Village Council as a signatory to the MOA (letter from Sandra Faulker, Regional Historian, National Park Service, Alaska Regional Office, Anchorage, Alaska, April 24, 1995). We concur.

The MOA requires AP&T to hire a qualified historical archeologist, and consult with the FS, the SHPO, and the NPS to determine the specific effects of the project on the Historic Landmark and the Canadian Oil pipeline, and to identify mitigative measures to minimize effects. The MOA requires AP&T to develop and implement a cultural resources management plan to implement mitigative measures and to protect cultural resources during project construction and operation, and to adhere to the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, the Alaska Comprehensive Preservation Plan, and the cultural resources documentation requirements of Klondike Gold Rush National Park. The MOA also requires AP&T to comply with the Native American Graves Protection and Repatriation Act if discoveries are made during the license term that make it applicable to the project.

We concur the MOA is adequate to protect cultural resources at the project. The project would not have an adverse effect on the Historic Landmark or the historic Canadian Oil pipeline if the MOA is implemented as a condition of a hydropower license. The MOA has been forwarded to the Advisory Council for signature. We recommend a condition requiring implementation of an acceptable MOA be included in any license issued for the project.

c. Unavoidable Adverse Impacts: None

#### 7. Recreation

a. Affected Environment: There are no developed facilities in the Goat Lake basin. The FS manages the area to retain its roadless and wildland character. Major recreational facilities would not be developed. The developed recreational facilities that exist outside of the basin consist of FS cabins, dispersed campsites, and picnic areas. The National Park Service operates the Klondike Gold Rush National Historical Park that includes a visitor center in Skagway and a campground in Dyea.

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Because of the difficulty in accessing the Goat Lake basin, very little recreational use occurs in the vicinity of the lake. Major recreational activities in the project vicinity are dispersed activities such as hiking, fishing, and sightseeing. The most common activity is sightseeing. Sightseeing tours are provided by the WP&YR RR, several highway tour operators along the Klondike International Highway, and aircraft companies.

Skagway and its vicinity, due to the attractions and cruise ship moorage, draws a large number of tourists to the area. The Skagway Convention and Visitor Bureau estimates that in 1993 about 350,000 tourists visited the area. Approximately 80 percent of southeast Alaska visitors come to the area by water.

Based on survey results, the applicant determined that many of these visitors are interested in sightseeing and photography. The applicant conducted a survey of the tour operators and was able to estimate that 23,000 visitors stopped at the viewpoints overlooking Pitchfork Falls during the season. In addition, 24 percent of the vehicles using the Klondike International Highway stopped at the viewpoints.

b. Environmental Impacts and Recommendations: The project would be in a remote location that is difficult to access. The site receives very little recreational use and the project would not have a significant effect on existing recreational opportunities with the exception of sightseeing activities from the WP&YR RR and the Klondike International Highway. This issue was discussed in the Aesthetic Resources Section.

As discussed earlier, Goat Lake has no known fish, and the state of Alaska and the FS have abandoned plans to create a sustainable fish population in the lake. Thus, the project would not affect recreational fishing. It is not anticipated that project operations would significantly affect access around the lake, as the lake level is primarily drawn down during the winter and spring months. During the peak visitation of helicopter tours over the project area, the lake level would either be rising from large inflows or close to normal elevation.

c. Unavoidable Adverse Impacts: None.

#### 8. Socioeconomics

a. Affected Environment: The project would provide power to the town of Skagway and the immediate vicinity. The

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population of the area is about 800. The economy of the area is driven by tourism. The unemployment for the region was higher than the state average in 1994, 10.6 percent versus 7.8 percent.

b. Environmental Impacts and Recommendations: The project would employ a work force of about 30 people over about a 2-year construction period. The total project construction budget would be about \$7.5 million; about 32 percent would be for labor. It's anticipated that workers would be drawn from southeast Alaska. Because of the short construction period, most workers would probably commute either daily or weekly or stay in temporary housing, and few, if any, would relocate to the immediate project area.

Increased employment from the project, albeit short-term, would benefit the region's economy. The project would also provide long-term economic benefits to the state and region from tax revenues that would be collected. The project would also benefit the region by providing a more stable and reliable form of energy than the current system, which relies mostly on diesel generation.

c. Unavoidable Adverse Impacts: None.

C. Impacts of the No-action Alternative

Under the no-action alternative, the project would not be constructed and there would be no changes to the existing physical, biological, or cultural resources of the area. The energy that would have been produced would continue to be provided by diesel fuel. With this alternative, the public would be denied the opportunity to conserve diesel (non-renewable primary fossil fuel) and to reduce atmospheric pollution. Because of the area's lack of roads and remoteness, diesel fuel is presently delivered by barge thus potentially exposing important aquatic habitats to risks such as oil spills into the environment. These risks would continue with or without the project, although much less with the project, because diesel generators would serve as a back-up during hydropower outages.

VII. DEVELOPMENTAL ANALYSIS

In this section, we look at the project's use of water resources for hydropower purposes to see what effect various environmental measures would have on the project's power

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benefits. As explained in Mead Corporation,<sup>19/</sup> the Commission assesses the potential economics of various alternatives using a current-cost approach that does not purport to predict future economic trends over the term of the license. Rather, it reviews economic factors in light of what is known at the time the application is considered. While no assumptions are made concerning future potential inflation or deflation, the analysis is not entirely a "first-year" approach, as certain costs need to be amortized over the period of years or will change in presently known and measurable ways. Thus, the current cost figures are derived using a 30-year period of analysis.

Because there was no recommended staff proposal that would affect project economics, we did the economic analysis using the applicant's proposal. We compared the benefits of the proposed operation to not building the project and continuing to use more diesel fuel. We found the 30-year net annual benefits for the low-, mid-, and high-load forecasts using the average hydrology estimate and the following assumptions (see Table 4):

- project operation begins in 1997,
- a 1997 construction cost of \$7,500,000,
- a 7 percent discount and interest rate,
- a 1997 power value of 101 mills per kilowatthour (mills/kWh),<sup>20/</sup>
- a 1997 operating and maintenance cost for the hydroelectric project of 5 mills/kWh, and
- a 1997 insurance cost of \$1.00/kWh.

Table 4. Staff's economic analysis of Goat Lake Hydroelectric Project using the average hydrology estimate.

	LOAD FORECAST	AVERAGE ANNUAL GENERATION	POWER VALUE BASED ON REPLACING DIESEL GENERATION	COST OF GOAT LAKE PROJECT	NET
ANNUAL					
BENEFITS					

(July 19/ See Mead Corporation, Publishing Paper Division, 72 FERC \_ 61,027 13, 1995).

20/ We base the value of the project's power on the average cost of purchasing diesel fuel and diesel O&M costs for the Skagway area.



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\$103,000	Low	6.4 GWh <sup>21/</sup>	\$831,000	\$934,000	-
\$182,000	Mid	9.7 GWh <sup>10</sup>	\$1,134,000	\$952,000	
\$350,000	High	11.5 GWh <sup>10</sup>	\$1,312,000	\$962,000	

We also assumed in our economic analysis that the energy sold for each year would correspond to the load forecast, until the year 2028. For example, in 1997, the Skagway area would need only 6.9 gigawatthours (GWh) of energy from the Goat Lake Project. Therefore, the project would only generate 6.9 GWh in 1997. In 2028, the project would reach its maximum energy generation potential of 13.3 GWh. The average generation over the 30-year economic analysis would be 9.7 GWh for the mid-load forecast.

With the above assumptions, the proposed project, producing an average of 9.7 GWh of energy, would have a net annual benefit for the mid-load forecast, which we consider the most likely forecast, of about \$182,000 or 18.8 mills/kWh. The high-load forecast would have greater net annual benefits at \$350,000 or 30.4 mills/kWh. For the low-forecast year, the project would cost more than the current cost of the most likely alternative source of power (diesel-fuel powered generators) for the Skagway area.

We realize that this comparison is not the only consideration in assessing the economic feasibility of the project. Among the other considerations is the future cost of fossil-fuel resources, particularly diesel fuel, which represents about two-thirds of the total cost per kWh of generation. The net annual benefits are, therefore, highly sensitive to fuel cost, which could vary widely over the 50-year license term for a new hydropower project. In any event, most of the cost of power that would be produced by the Goat Lake Project is for debt retirement on the initial capital cost and would remain constant over time, and unaffected by inflation. Only about 5 percent of the total cost per kWh is for operation and maintenance, which would be subject to future increases caused by inflation.

21/ The average project generation was based on a 30-year period.

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#### VIII. COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a)(1) of the FPA require the Commission to give equal consideration to all uses of the waterway on which a project is located. When we review a proposed project, we equally consider the environment, recreation, fish and wildlife, and other non-developmental values of the project as well as power and other developmental values. Accordingly, any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Based on our independent review of agency and public comments filed on this project, and our review of the environmental and economic effects of the proposed project and its alternatives, we've selected the proposed project, along with the applicant's proposed environmental measures, as the preferred option. The preliminary FS section 4(e) conditions have been incorporated into our preferred alternative. We've determined that none of the measures in our preferred option have an effect on the project's economics.

We recommend the proposed project because: (1) issuance of an original hydropower license would allow AP&T to construct and operate the project as a small but dependable source of electrical energy for its customers; (2) the project would meet the increasing demand for electric power in Skagway and avoid the need for an equivalent amount of fossil-fuel-fired, electric generation and capacity, thereby continuing to help conserve these nonrenewable energy resources and reduce atmospheric pollution; and (3) the recommended environmental measures would protect or mitigate the soil, vegetative, wildlife, aesthetic, and cultural/historic resources in the Skagway River Valley.

We believe that our preferred option would be best adapted to the comprehensive development of Pitchfork Falls for beneficial public uses.

#### IX. RECOMMENDATIONS OF FISH AND WILDLIFE AGENCIES

Under section 10(j) of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of fish and wildlife resources affected by the project.

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No fish and wildlife agencies provided recommendations in response to our notices that the application was ready for environmental analysis.

#### X. CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2) of the FPA requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project.

Accordingly, federal and state agencies filed 23 plans with the Commission that address various resources in Alaska. Three are relevant to this project.<sup>11/</sup> No conflicts were found.

#### XI. FINDING OF NO SIGNIFICANT IMPACT

In accordance with the National Environmental Policy Act of 1969, we prepared this environmental assessment for the Goat Lake Hydroelectric Project to identify the resources that the licensing decision could impact and discuss the specific impacts the Goat Lake Hydroelectric Project would have on the human environment.

Project construction would cause minor short-term, localized erosion; temporary relocation of wildlife; and increased traffic and dust levels in the project area. In addition, project development would permanently alter about 9.25 acres of native trees and other vegetation (some of which would be revegetated) and 1 acre of wetland habitat. The new structures and altered flows along Pitchfork Falls could detract from the natural aesthetics of the Goat Lake basin and Skagway River Valley.

11/ (1) Alaska Department of Natural Resources, 1979, Haines-Skagway area

Land Use Plan, Juneau, Alaska; (2) U.S. Forest Service, 1991, Tongass National

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(3) U.S. Fish and Wildlife Service and Canadian Wildlife Service, 1986, North

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We find that implementing the protection and mitigation measures described in this FEA would ensure that environmental effects of the project would be insignificant.

On the basis of this independent environmental analysis, we find that issuance of an original hydropower license by the Commission and SUA by the FS for this project would not constitute major federal actions significantly affecting quality of the human environment. Therefore, an environmental impact statement is not required.

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## APPENDIX A

### COMMENTS ON THE DRAFT EA AND STAFF RESPONSES

### STAFF'S RESPONSES TO COMMENTS ON THE GOAT LAKE DEA

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FWS-1        Comment noted.

STAFF'S RESPONSES TO COMMENTS ON THE GOAT LAKE DEA

NPS-1            As discussed on page 20 of the DEA (see Terrestrial Resources section), the results of 10 years of surveys by the Alaska Department of Fish and Game (ADFG) indicate that there are not significant goat habitat or populations in the Goat Lake Basin. Information from the ADFG indicated that goat use in the area surrounding Goat Lake is minimal. There haven't been any known signs (hooveprints, fecal droppings, skeletons, carcasses, etc.) detected in the immediate Goat Lake area and there aren't known seasonal movements within the project boundary.

Therefore, neither direct nor cumulative effects to the goat population would result from the use of helicopters during construction of this project. We agree that significant goat habitat exists in the steeper areas beyond the Goat Lake basin; however, these areas would not be affected by the travel route of helicopters accessing the project. This is based on maps and models described in the U.S. Forest Service (FS) 1995 Environmental Assessment for Helicopter Landing Tours in the Skagway and Haines Area.

Although we find that mountain goats would not be affected by project development, AP&T nevertheless proposes to adjust their construction schedule to avoid possible disturbance during the goat mating and kidding periods. AP&T would consult with the ADFG on acceptable construction timing, and we agree this would be a prudent license requirement (see Terrestrial Resources section). To further ensure that no wildlife, including goats, are affected by helicopters, the FS has included as a preliminary 4(e) Condition, that AP&T file a wildlife mitigation plan requiring the same specified clearance from wildlife that is required for the helicopter tours.

The FS and the ADFG, in conjunction with local helicopter tour operators, are working toward developing a monitoring plan for the north Lynn Canal mountain goat populations. The National Park Service (NPS) is welcome to participate in this effort.

We don't require a specific cost amount for mitigating adverse project impacts, but believe our recommended

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wildlife protection measures would adequately minimize the potential effects on mountain goats.

STAFF'S RESPONSES TO COMMENTS ON THE GOAT LAKE DEA

NPS-2           The Memorandum of Agreement (MOA) (referenced in the Cultural Resources section of the FEA) contains provisions to develop and design alternatives that, to the extent feasible and practicable, would avoid or minimize any visual effect within the National Historic Landmark. The project design decisions regarding visual issues would include consultation with the National Park Service. The National Park Service is a signee to the MOA. In addition, staff's recommended visual resources management plan (referenced in the Aesthetic Resources section of the FEA) would require measures to minimize possible visual effects, and would be coordinated with the recommended erosion control, terrestrial resources, and cultural resources management measures.

                  We don't require a specific cost amount for mitigating project impacts, but believe our recommended measures in the MOA and visual resources management plan would adequately minimize any anticipated visual resource effects.

STAFF'S RESPONSES TO COMMENTS ON THE GOAT LAKE DEA

AP&T-1       We agree. We've revised our economic analysis to include the capacity credits. The results are in the Developmental Resources section of the FEA.

AP&T-2       We've revised our economic analysis to include the correct cost.

AP&T-3       After going over this information, we've revised our economic analysis to include our new estimate of the power value.

STAFF'S RESPONSES TO COMMENTS ON THE GOAT LAKE DEA

AP&T-4           Typographical error corrected in the Developmental Resources section of the FEA.

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AP&T-5            In the DEA and FEA economic analyses, we used a current cost approach (as explained in Mead Corporation, Publishing Paper Division, 72 FERC \_ 61,027, July 13, 1995) that does not predict future economic trends over time. Our FEA economic analysis (see Developmental Analysis section) now shows positive net annual benefits under the mid-load scenario, because we included "capacity benefits". Our DEA did not analyze "capacity benefits" because they were not included in the project application.

NOTE:            Attachments 1, 2, and 3 of AP&T's April 4, 1996, letter has been filed with the Commission and is available upon request.

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**Rev. 12/16/97**

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