

Plan for Mitigation of Adverse Effects to the Eklutna Project, Alaska

1.1 Introduction

The Department of Energy, Alaska Power Administration (APA) administers and operates the Eklutna Project, a hydroelectric generating and transmission complex in the vicinity of Anchorage, Alaska. On November 28, 1980, the President signed legislation that directed the Department of Energy to divest itself of the Eklutna Project. The Eklutna Project will be sold to three non-federal utilities in 1996 under a 20-year agreement between APA and the utilities. With the sale of the Eklutna Project, the Alaska Power Administration will cease to exist. The Department of Energy, Western Area Power Administration will thereafter assume any remaining federal obligations with the two projects.



EKLUTNA HYDROELECTRIC PROJECT MITIGATION PLAN

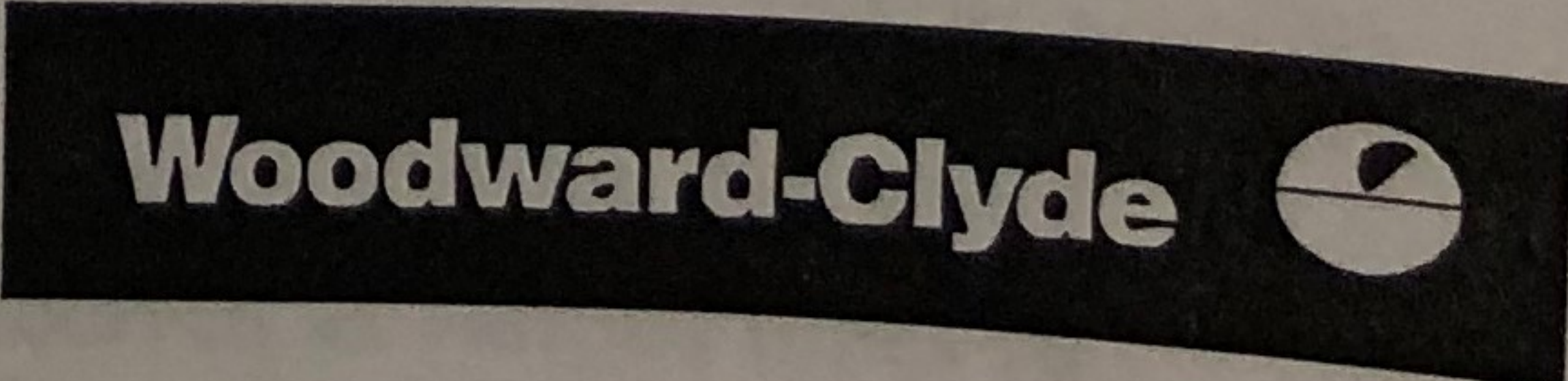
In 1980, APA evaluated the eligibility of the Eklutna and Seward Projects for nomination to the National Register of Historic Places (see Appendix A). On the basis of that evaluation, APA determined that the Eklutna Project is eligible for the National Register of Historic Places, and that divestiture of the Eklutna Project may constitute adverse effect to a historic property. APA has prepared this plan to mitigate adverse effects of the Eklutna Project with reference to guidelines of the Advisory Council on Historic Preservation in 35 CFR 800.

2.0 Description of the Eklutna Project

The Eklutna Project is located in south-central Alaska, about 24 miles northeast of Anchorage and 15 miles south of Palmer. Features included in the Eklutna Project are (1) a dam that raises the natural level of Eklutna Lake; (2) a powerhouse structure at the bottom of the lake; (3) a 4.5-mile-long tunnel; (4) a 1.2-mile-long, steel and concrete penstock; (5) a generating station with total installed capacity of 20 megawatts; and (6) a tailrace channel and channel that drain into Kuk River. The Project also includes transmission lines that connect the generating station, several feeder buildings at the generating station, and three miles from the generating station to Palmer and Anchorage, and three miles from Palmer to Anchorage.

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The Eklutna Project, as it originally was, was constructed in two phases. Construction of the first phase began in 1954 and was completed in 1958. Construction of the second phase began in 1958 and was completed in 1962. The project has a powerhouse control system, penstock, transmission lines, and tailrace channel. The project is a significant part of the history of the State of Alaska.



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1.0 Introduction

The Department of Energy, Alaska Power Administration (APA) administers and operates the Eklutna Project, a hydroelectric generating and transmission complex in the vicinity of Anchorage, Alaska. On November 28, 1995, the President signed legislation that directed the Department of Energy to divest itself of the Eklutna Project. The Eklutna Project will be sold to three non-federal utilities in 1996, under a 1989 agreement between APA and the utilities. With the sale of the Eklutna Project and the Snettisham Project near Juneau, Alaska, the Alaska Power Administration will cease to exist. The Department of Energy, Western Area Power Administration will thereafter assume any remaining federal responsibilities associated with the two projects.

In 1996, APA evaluated the eligibility of the Eklutna and Snettisham projects for nomination to the National Register of Historic Places (see Appendix A). On the basis of that evaluation, APA determined that the Eklutna Project is eligible for the National Register of Historic Places, and that divestiture of the Eklutna Project may constitute adverse effect to a historic property. APA has prepared this plan to mitigate adverse effects of divestiture of the Eklutna Project with reference to guidelines of the Advisory Council on Historic Preservation, found in 36 CFR 800.

2.0 Description of the Eklutna Project

The Eklutna Project is located in south-central Alaska, about 34 miles northeast of Anchorage and 15 miles south of Palmer. Principal features of the Eklutna Project are (1) a dam that raises the natural level of Eklutna Lake, (2) an intake structure at the bottom of the lake, (3) a 4.5-mile-long tunnel, (4) a 1,088-foot-long steel and concrete penstock, (5) a generating station with total installed capacity of 30 megawatts, and (6) a tailrace conduit and channel that drain into Knik River. The Project also includes transformers and switch gear at the generating station, several ancillary buildings at the generating station site, transmission lines from the generating station to Palmer and Anchorage, and three substations.

The Eklutna Project, as it currently exists, was constructed in two episodes: original construction from 1951 to 1954, and reconstruction of some features following the Good Friday Earthquake in 1964. Alterations and reconstruction have occurred at various times to powerhouse control systems, main transformers, transmission lines, and substations. As a result of these alterations, many features or elements of the Eklutna Project do not represent

Table 1: Elements of the Eklutna Project

Element	Description	Dates	Contributing Element
Dam	Earth and rock fill, 815 feet long and 51 feet high. The dam's spillway is a rectangular, poured concrete conduit through the dam structure.	1965	No
Intake Structure	Poured-in-place concrete structure with trashgate, connected to the main power tunnel by about 120 feet of precast concrete conduit.	1965	No
Conduit	120 feet of precast concrete pipe connecting the intake structure with the power tunnel.	1952-1953, repaired 1965	Yes
Power Tunnel	23,550 feet long and 9 feet in diameter. The entire length of the round tunnel is lined with cast-in-place, reinforced concrete.	1952-1954	Yes
Tunnel Gate Shaft	Poured concrete surface structure and a concrete-lined shaft 9 feet in diameter and about 200 feet from surface to bottom; steel bulkhead gate at the bottom.	1952	Yes
Surge Tank	181 feet tall and 30 feet in diameter, reinforced concrete walls and floor; steel, fixed-wheel gate; gate control cabinet is housed in a weatherproof shelter at the top of the surge tank.	1954	Yes
Penstock	Welded and coupled steel pipe encased in poured concrete, with pipe diameters of 91, 83 and 75 inches. The pipe descends 864 feet at an angle of 53 degrees and then runs horizontally 501 feet to the generating station.	1953-1954	Yes
Powerplant	Reinforced concrete structure with flat roofs on two levels; interior is arranged in three principal levels; original generators, turbines, control panels, other equipment.	1951-1954 Minor alterations	Yes
Transformers	Original step-up transformers remain on site, were replaced in 1995.	1954	Yes
Tailrace	200-foot-long reinforced concrete conduit and 1000-foot-long channel	1965	No
Office Building	Gabled metal frame structure on concrete slab.	1982	No
Warehouse	Metal frame structure with sheet metal walls and roof.	1953	Yes
Garage	Metal-clad, gabled wood frame structure.	post-1964	No
Fueling Station	Metal tanks and pumps under a small canopy.	post-1964	No
Palmer Substation	Two metal towers, one transformer.	1954	Yes
Reed Substation	Small gabled building, metal towers, transformers.	post-1960	No
Anchorage Substation	Gabled wood frame building, microwave structure, metal towers and transformers	Building 1954; Other post-1960	No
Transmission Lines	40+ miles of 115 kilovolt lines on H-frame and triple T-frame wooden towers.	Some ca. 1954	No

the original construction of the project and are not considered to be contributing elements of the historic complex. Some original elements of the Eklutna Project, including construction camps and buildings, no longer exist or are no longer in federal ownership. Elements of the Eklutna Project are described at length in the evaluation report, which is Appendix A to this mitigation plan. Table 1 presents the existing elements of the Eklutna Project.

3.0 Significance

Sections 2.1 through 2.4 of Appendix A addresses historical contexts pertinent to the Eklutna Project at length, and Section 3.2 of Appendix A addresses the National Register eligibility of the Eklutna Project under each of the historical contexts and each of the National Register Criteria for Eligibility (36CFR60.4). Following is a brief summary of the evaluations according to the National Register Criteria for Eligibility.

3.1 Integrity

The Eklutna powerplant and machine shop, penstock, surge tank, power tunnel, and warehouse retain a high degree of integrity of design, materials, workmanship, and association from the period of original construction and operation of the Project. The dam, intake structure, and tailrace were substantially rebuilt in 1965 and retain low integrity from the period of original construction. The garage and fueling station in the powerplant complex were constructed in 1965 or later. The dominating feature of the Project is the powerplant, and therefore the Eklutna Project retains sufficient integrity to adequately represent its history. Features that are not ca. 1952-1954 construction may be considered to be non-contributing elements of a historic district.

3.2 Criterion A: Association with Events that have made a Significant Contribution to the Broad Patterns of our Past

The Eklutna Project is eligible for nomination to the National Register of Historic Places under Criterion A. The Eklutna Project is significant for its role in and representation of the historical context "Hydroelectric Development in Alaska, 1898-1980" and particularly in the

subcontext of federal involvement in electrical development in Alaska after World War II. The Eklutna Project also represents the national historical context "Federal Hydroelectric Development, 1902-1980" and the local context "Power Development in the Anchorage Area, 1916-1980," but the Eklutna Project does not have demonstrated exceptional importance within these contexts that might allow listing of the Project under an exemption to the 50-year age standard for the National Register.

3.3 Criterion B: Association with the Lives of Persons Significant in our Past

The Eklutna Project was designed by a team of professional engineers within the Bureau of Reclamation. Evidence has not been found that the Project is associated with certain individuals who were important in our past.

3.4 Criterion C: Embody the Distinctive Characteristics of a Type, Period or Method of Construction; Represent the Work of a Master; Possess High Artistic Values; Represent a Significant and Distinguishable Entity whose Components may lack Individual Distinction

The architecture and technology of the Eklutna Project are not exceptionally important. The powerplant, intake structure, tunnel gate shaft, surge tank, tailrace walls, and dam spillway structure are cast-in-place reinforced concrete without embellishments or decoration. The dam, intake structure, and tailrace were rebuilt in 1965 following the Good Friday earthquake. The office building, garage, and fueling station were built after 1965. All other structures are original to the ca. 1952-1954 construction.

The water supply system applies features used previously in other hydroelectric projects. The intake structure located at the bottom of Eklutna Lake is similar in concept to the intake employed at the Annex Creek powerplant at Juneau in 1916; similar structures are also used in the Snettisham Project. The 4.5-mile-long power tunnel is the longest water supply tunnel in Alaska, but it is relatively short compared to the 13.4-mile-long tunnel installed by the Bureau as part of the Colorado-Big Thompson Project in the 1930s in Colorado. The reinforced concrete lining of the tunnel and the construction of the surge tank are also not unusual.

4.0 Proposed Federal Undertaking

The powerplant has an extremely simple, utilitarian design. The only unusual aspect of the powerplant is the location of the main switchgear on the roof, which was made necessary by the proximity of the Old Glen Highway to the powerplant. Nearly all equipment within the powerplant and attached machine shop was specified by the Bureau, and none of the equipment is unusual for a Bureau-operated powerplant of its time. The 25,000-horsepower Francis-type turbines operate at 600 revolutions per minute; the turbines were actually built in 1948, prior to project authorization, by the Newport News Ship Building and Dry Dock Company of Virginia. The generators were built to Bureau specifications by the Pacific Oerlikon Company in Switzerland and were provided through the company's Tacoma, Washington office.

The original 20 megawatt step-up transformers were built by Westinghouse Electric Company of Denver, Colorado. These transformers were changed out in 1995 but remain on the site. Transmission towers are simple H-frame and triple-T-frame wooden structures. About half of the machinery in the machine shop dates to original construction of the Project. These machines were and are standard heavy metal-working tools, and evidence has not been found that these machines are remarkable in function or design.

The warehouse is the only original structure in the powerplant complex that dates from the original construction of the Project, other than the powerplant and attached machine shop. The steel frame warehouse has a very simple design.

The warehouse is the only original structure in the powerplant complex that dates from the original construction of the Project, other than the powerplant and attached machine shop. The steel frame warehouse has a very simple design.

3.5 Criterion D: Has Yielded or May Yield Information Important in History or Prehistory

Design, construction methods, and materials for the Eklutna Project are well documented. Evidence has not been found that the existing information has advanced knowledge of history or prehistory beyond documentation of the Project itself, nor that the Project might yield important information in the future.

4.0 Proposed Federal Undertaking

The Act authorizing the Eklutna Project recognized the possibility of transferring the project to private ownership:

Sec. 4 [Report to Congress on transfer of project to public ownership.] Upon completion of amortization of the capital investment allocated to power, the Secretary is authorized and directed to report to the Congress upon the feasibility and desirability of transferring the Eklutna project to public ownership and control in Alaska (Act of July 31, 1950, 64 Stat. 382).

Sale of the Eklutna Project was proposed in the President's budget for Fiscal Year 1986 and subsequent years. Invitations for proposals for purchase of the Eklutna Project were extended in the spring of 1987 to the electric utilities served by the project, municipalities in the project service areas, and to the State of Alaska. On November 9, 1987, APA received a joint proposal from the City of Anchorage, the Matanuska Electric Association, and the Chugach Electric Association to purchase the Eklutna Project. A Purchase Agreement based on this proposal was entered into by the purchasers and APA on August 2, 1989; this agreement would become effective upon Congressional authorization of the divestiture. Congress authorized divestiture in 1995, and divestiture and sale are proposed in 1996.

The divestiture and sale of the Eklutna Project would result in the transfer of title from the federal APA to private purchasers. This transfer would end APA's ability to consider and manage historic properties in the Eklutna Project under provisions of the National Historic Preservation Act, and therefore APA considers divestiture and sale of the Eklutna Project to be a potential adverse effect. Mitigation of the potential adverse effects according to the following plan will yield a condition of No Adverse Effect for the divestiture and sale.

5.0 Mitigation Plan

The significance of the Eklutna Project is in its representation of the Federal Government's role in electrical development in Alaska after World War II; significance does not lie in the technology or construction of the project or in the potential for recovery of information that

might be important in history or prehistory. The proposed federal undertaking is transfer of ownership only. APA anticipates that the Eklutna Project will be maintained as an operating hydroelectric generating and transmission complex, which is its historic function.

Appropriate treatment to avoid adverse effect of transfer is therefore (1) documentation of the features of the Eklutna Project that reflect its significance, and (2) preservation and archiving of photographs, drawings, and plans that reflect the construction and operation of the Eklutna Project throughout its period of federal ownership and operation. This treatment will result in a body of information concerning the physical nature of the Eklutna Project that will be available to researchers and the general public.

Eklutna Project elements will be documented to Historic American Engineering Record (HAER) Level II standards.

1. Up to 30 large-format (4"x5") photographs will document the existing structures and principal equipment prior to divestiture; historical photographs will be reproduced as described in item (5) below. Two or more photographs may be taken of elements considered to be contributing to the historic complex (see Table 1), and single photographs may be taken of elements considered to be non-contributing to the historic complex. Principal equipment, including turbines, generators, and control panels, will be photographed. The intake structure, the conduit in Lake Eklutna, power tunnel, and penstock outside the powerplant are inaccessible and will not be photographed.
2. Up to 10 large-format (4"x5") photographs will document plans and drawings for structures and principal equipment. Plans and drawings will not otherwise be reproduced.
3. The report Eklutna Dam, Tunnel and Powerplant, Technical Record of Design and Construction, published by the Bureau of Reclamation in 1958, will be photocopied on acid-free paper and included as part of the HAER documentation package. This report contains extensive information about the authorization, design, and construction of the Eklutna Project.
4. Historical, geographical, bibliographical, and other information required for HAER documentation will be prepared and included in the HAER documentation package.

5. Files at the Eklutna Project include more than 2,400 large-format photographs showing aspects of planning, construction, rehabilitation, and operation of the project beginning in 1950. Up to 2,000 of these photographs will be reproduced as large-format, archivally-stable prints and negatives.
6. One copy of the HAER documentation package will be submitted to the National Park Service HAER coordinator in Alaska, and one copy will be submitted to the Alaska State Historic Preservation Officer. One photo print and one copy negative of the Eklutna Project photographs will be submitted to the National Archives in Anchorage, with photo identification and captions.

All field documentation and retrieval of the Eklutna Project photographs will be accomplished prior to transfer of the property to the purchasers, the date of which is currently unknown. Field documentation is anticipated to begin in late June 1996, and mitigation completion is anticipated by September 30, 1996.

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3.3 CONCLUSION OF ELIGIBILITY AND MANAGEMENT RECOMMENDATION

The Eklutna Project is recommended to be eligible for listing in the National Register under Criterion A, principally for its representation of federal involvement in electric development in Alaska. The Project is not recommended to be eligible under other Criteria for Eligibility.

Transfer of the Eklutna Project from federal ownership may be considered to be an effect to this historic resource. Mitigation of effects should focus on the significance of the resource, which for the Eklutna Project is primarily the construction and operation of the Project by the Bureau and, secondarily, the effect of the power supply on the Anchorage area. Appropriate mitigation therefore should focus on preservation of information concerning project planning, construction, and operation from 1948 to 1996. Substantial information currently exists in the form of an extensive photograph collection, planning documents, project schematic plans, construction completion reports, and other reports and materials.

Recommended measures for mitigation of effects are (1) documentation of the powerplant, machine shop, and warehouse to standards of the Historic American Engineering Record (HAER); (2) reproduction of the photograph collection maintained at the Eklutna project office, with accompanying documentation; (3) collection of project planning, construction, and operations documents and reproduction of those documents in archivally stable media; and (4) archival storage of one copy of HAER documentation, photographs, and other documents at the National Archives in Anchorage, in addition to submittal of HAER documents to the National Park Service and State Historic Preservation Office. A summary document should be provided to the City of Anchorage for use in the City's heritage preservation programs. HAER documentation should be accomplished before the generators are changed out in 1996.