

**ALASKA STATE LEGISLATURE
HOUSE SPECIAL COMMITTEE ON ENERGY**

January 27, 2011
3:04 p.m.

MEMBERS PRESENT

Representative Neal Foster, Co-Chair
Representative Lance Pruitt, Co-Chair
Representative Bob Lynn
Representative Dan Saddler
Representative Pete Petersen
Representative Chris Tuck

MEMBERS ABSENT

Representative Kurt Olson

OTHER LEGISLATORS PRESENT

Representative Carl Gatto (via teleconference)

COMMITTEE CALENDAR

PRESENTATION: ALASKA ENERGY AUTHORITY

- HEARD

PREVIOUS COMMITTEE ACTION

No previous action to record

WITNESS REGISTER

MICHAEL HARPER, Acting Executive Director
Alaska Energy Authority (AEA)
Department of Commerce, Community & Economic Development (DCCED)
Anchorage, Alaska

POSITION STATEMENT: Introduced Bryan Carey, Technical Engineer for AEA, and Sara Fisher-Goad, Deputy Director-Operations, for the Alaska Industrial Development & Export Authority (AIDEA) and AEA.

BRYAN CAREY, Technical Engineer
Alaska Energy Authority (AEA)
Department of Commerce, Community & Economic Development (DCCED)
Anchorage, Alaska

POSITION STATEMENT: Gave a PowerPoint presentation titled, "Railbelt Large Hydroelectric," that was an overview on the "Railbelt Large Hydro Evaluation Preliminary Decision Document" issued by AEA and dated 11/23/10.

RICH WILSON, Spokesperson
Alaska Ratepayers Inc. (Alaska Ratepayers)
Anchorage, Alaska

POSITION STATEMENT: Testified on the presentation by AEA.

SARA FISHER-GOAD, Deputy Director-Operations
Alaska Industrial Development & Export Authority (AIDEA) and AEA
Department of Commerce, Community & Economic Development (DCCED)
Anchorage, Alaska

POSITION STATEMENT: Reviewed the schedule of the Susitna Hydroelectric Project and answered questions regarding the financing of the project.

BILL NOLL, Spokesperson
Alaska Ratepayers Inc. (Alaska Ratepayers)
Anchorage, Alaska

POSITION STATEMENT: Answered a question and commented during the presentation by AEA.

ACTION NARRATIVE

[3:04:26 PM](#)

CO-CHAIR NEAL FOSTER called the House Special Committee on Energy meeting to order at 3:04 p.m. Representatives Foster, Saddler, Petersen, Tuck, Lynn, and Pruitt were present at the call to order. Also in attendance was Representative Carl Gatto via teleconference.

PRESENTATION: ALASKA ENERGY AUTHORITY

[3:05:22 PM](#)

CO-CHAIR FOSTER announced that the only order of business would be a presentation by AEA on the "Railbelt Large Hydro Evaluation Preliminary Decision Document" dated 11/23/10.

[3:05:37 PM](#)

CO-CHAIR FOSTER introduced committee staff.

[3:07:39 PM](#)

MICHAEL HARPER, Acting Executive Director, Alaska Energy Authority (AEA), Department of Commerce, Community & Economic Development (DCCED), introduced Bryan Carey, Technical Engineer at AEA and Sara Fisher-Goad, Deputy Director-Operations, AIDEA and AEA, who would present the report.

[3:08:31 PM](#)

BRYAN CAREY, Technical Engineer, Alaska Energy Authority (AEA), Department of Commerce, Community & Economic Development (DCCED), began with a brief history of the two proposed hydroelectric (hydro) projects. He displayed a map that showed the locations of the Watana dam site on the Susitna River and the Chakachamna intake site on the Chakachamna River. In the early 80's both of the sites were studied by the Alaska Power Authority. Before the studies were discontinued, the cost of building the Chakachamna project was estimated at \$1.5 billion. For the Susitna project, the original plan called for building two dams, one at Watana and one at Devil's Canyon, 30 miles downstream. Due to declining state revenue, the project was reconfigured to a three-stage project beginning with building a lower Watana dam, followed by a dam at Devil's Canyon, and finally raising the height of the Watana dam from 700 feet to 885 feet during the third stage of construction. The final cost for the three-stage project was estimated at \$5 billion. In 1984 the price of oil dropped to approximately \$9 per barrel, further decreasing state revenue, and there were sufficient reserves of natural gas in Cook Inlet to provide low-cost electricity. Since then, gas reserves in the Cook Inlet have declined and the generation and transmission infrastructure built by the utilities has aged. Furthermore, last year the state legislature passed a state energy policy which set a statewide goal of achieving 50 percent renewable energy use by 2025. Looking at the possibilities to reach that goal, and the need for new generation along the Railbelt, Mr. Carey advised the only way to reach the renewable energy goal was to follow the 2010 AEA Regional Integrated Resource Plan (RIRP) recommendation and study the two hydro projects. Over the past year AEA has looked at the cost and impacts of the two projects in depth. He then displayed a map showing the location of the Watana dam site and powerhouse 40 miles south of the Denali Highway and 90 miles upstream of Talkeetna on the Susitna River. The dam would be approximately 700 feet tall - although it may be referred to as the lower Watana project - it is a very large dam, standing 550 feet above ground. He furnished a map showing the location of the Chakachamna project east of Lake Clark

National Park and Preserve (national park), and upstream of the Trading Bay State Game Refuge (refuge). This project uses a lake-tap that diverts the water from the existing Chakachatna River over to the McArthur River valley through a 10-12 mile long tunnel. A significant feature of this proposal is the challenge of obtaining permits to divert water from one river system to another as resource agencies will require sufficient environmental flow for existing salmon, and the amount of energy produced by the project would be reduced proportionately.

[3:14:17 PM](#)

MR. CAREY explained the dam on the Susitna River at Watana would create a reservoir approximately 39 miles long and 2 miles wide, situated 30 miles above significant salmon habitat; in fact, previous studies did not find any salmon above the dam location. In 2003, some Chinook salmon were found, but it is uncertain whether they are only present in low-water years. Further, there would be some loss of wildlife habitat as the reservoir fills, but the fisheries impact is believed to be minimal as 99.9 percent of salmon in the Susitna River spawn below this area. In comparison, approximately 40,000 red salmon travel up through Chakachamna Lake to the national park and it is known that the lake contains Lake Trout, Dolly Varden, Whitefish, and perhaps spawning salmon. Initially, the diversion of water by the Chakachamna project could possibly cause the wetlands to dry out, affecting salmon habitat in the refuge, potentially blocking migration, and substantially affecting the salmon downstream. Furthermore, locating the powerhouse in a different river system may require catching the salmon and trucking them into the lake or to the proper river system. Another concern is that juvenile salmon may follow the powerhouse current into the powerhouse.

[3:17:12 PM](#)

MR. CAREY cautioned that the Federal Energy Regulatory Commission (FERC) licensing for the Chakachamna project may also be a problem as the U.S. National Park Service notified FERC that Kenibuna Lake, located within the national park, may be hydrologically connected to Chakachamna Lake and if so, an act of Congress is required to issue a FERC permit. Mr. Carey then compared the energy produced by the two projects: Susitna installed capacity would be 600 megawatts (MW), its average energy would be 2,600 gigawatt hours per year (GWhr/yr), and it would provide about 50 percent of the annual energy use by the Railbelt. Chakachamna's installed capacity would be

approximately 300 MW, its average energy would be 860-1,100 GWhr/yr, and it would provide about 20 percent of the annual energy use by the Railbelt - an amount that is unlikely to reach the state's goal. Slide 7 was a graph titled, "Railbelt Demand" which indicated that the Railbelt electrical demand for power peaks during the winter months and decreases during the summer. Energy output from both proposals also peaks during the summer, but the big difference between the projects is that Chakachamna does not have capacity for water storage thus its output during the winter is likely to be less than that produced by Bradley Lake Hydroelectric Project (Bradley Lake Hydro); however, Susitna would produce a significant amount of energy during the winter. In response to Representative Saddler, he explained that during the period of high water flow in the summer the proposed Susitna project could store 25 percent for flow in the winter.

[3:20:37 PM](#)

MR. CAREY displayed slide 8 titled, "Railbelt Energy: Energy by Resource Type." He explained that the hydro energy shown in yellow on the graph represents power produced by the proposed Susitna project, beginning in 2025. He noted that energy produced by natural gas is still required by the utilities for the generation of power through 2059. Slide 9 titled, "Estimated Cost of Power," was a comparison of the cost of power from three projects, not including operation, maintenance, and utility distribution costs: Susitna Embankment with 50 percent state contribution and 30 year bonds; Susitna Roller Compacted Concrete (RCC) with 50 percent state contribution and 30 year bonds; Chakachamna with 50 percent state contribution and 30 year bonds. The estimated cost after the Susitna project constructed with an embankment dam is approximately 6 cents per kilowatt hour (kW/hr), which is about the same as the present cost. If the Susitna project were constructed by RCC, the cost drops to 5 cents per kW/hr. The cost of energy from Chakachamna would be about 12 cents per kW/hr. The state's contribution to the chosen project could be handled in many different ways.

[3:24:44 PM](#)

MR. CAREY displayed a slide of Bradley Lake Hydro, which is the largest project in the state and an example of an embankment dam. There are no fish present in the lake and the water released is for the benefit of fish below the dam. If built as an embankment dam, the Susitna dam would be similar, but taller. He then displayed a slide of the Al Wehdah Hydroelectric Project

in Jordan which was an example of a RCC constructed dam. This method uses concrete, but the concrete is placed using thicker layers, which saves time and material. Construction of an expandable embankment dam at Watana would require 33 million cubic yards of material, but using RCC construction, only 7.5 million cubic yards are needed and construction time is reduced. Mr. Carey further explained that raising the height of an embankment dam by 185 feet would require 30 million yards of material, whereas he estimated the amount needed to raise a RCC constructed dam to the higher stage would be 7 million cubic yards.

[3:27:40 PM](#)

MR. CAREY, in response to a question, acknowledged that the specifications on a RCC constructed dam "are not necessarily as tight as what the conventional concrete is, but one of the big differences is ... they are able to put it on in much thicker layers." Usually, if concrete is applied in thick layers it begins to heat and must be cooled to prevent cracks. But in the case of roller compacted concrete, other materials are added and the roller machine removes all of the air voids with vibration.

[3:28:41 PM](#)

REPRESENTATIVE PETERSEN asked for the size of the tallest RCC constructed dam.

MR. CAREY said there are completed RCC dams over 700 feet, and some are under design around the world reaching close to 1,000 feet. He related the Susitna timeline: three and one-half years for licensing and final application document; three years for FERC processing and follow-up; four and one-half years for construction; power generation within approximately eleven years. The next steps for the Susitna project are: hold public meetings from late February through mid March; begin engineering and environmental studies including data gap analysis; meet with resource agencies; mapping; form working groups with stakeholders and landowners; work on access issues; if authorization and funding are received, file the FERC notice of intent and preliminary application document. He observed that until the project is official with FERC, some of the resource agencies resist spending time on the project. Further steps would be undertaking the FERC draft environment study plans, along with the engineering evaluation of embankment versus RCC dam construction, and determining the best type and location of the powerhouse. In response to Representative Tuck, he said

that some of the resource agencies involved in addition to FERC are the U. S. Fish and Wildlife Service (USFWS), the Bureau of Land Management (BLM), the U.S. National Park Service (NPS), the National Marine Fisheries Service (NMFS), the Alaska Department of Fish and Game (ADFG) and the Department of Natural Resources (DNR). All of these agencies have mandatory "conditioning powers" that cannot be easily overruled by FERC. He assured the committee the probability of getting a license is very good, although the question is what conditions will be attached.

[3:34:28 PM](#)

REPRESENTATIVE TUCK asked how the state would fare with the federal agencies.

MR. CAREY advised the federal agencies will be diligent regarding the project, although this project has advantages over other hydro projects in that there are few fish affected, and it is a glacial river with less environmental impact than traditional hydro projects in the Lower 48.

[3:35:38 PM](#)

REPRESENTATIVE SADDLER asked whether the Environmental Protection Agency (EPA) would be involved.

MR. CAREY was unsure, but surmised that 150-200 permits would be needed for a project like this.

[3:36:13 PM](#)

REPRESENTATIVE PETERSEN asked what would be needed to upgrade the transmission lines to distribute the electricity from the powerhouse to the current electric grid.

MR. CAREY said the Watana site is approximately 35-40 miles east of the location of the existing northern intertie. The cost estimate that was done covers bringing the power lines to the intertie. Soon upgrades will be required for the intertie, regardless of whether the project proceeds. The cost of the upgrades ranges from \$500-\$800 million and the utilities will prioritize this task. Mr. Carey then listed the benefits of the Susitna project: greater than 100 year life; expandable for future growth by adding dams on the river or raising the height of the dam; a source of predictable, secure, low cost energy; insulates the state from impacts of world events; income from the sale of power stays in the state; necessary to reach the

state goal of 50 percent renewable by 2025; lower cost for electricity in the long-term.

[3:39:59 PM](#)

RICH WILSON, spokesperson, Alaska Ratepayers Inc. (Alaska Ratepayers), stated that his organization was developed out of concern over the volatility of electric rates over the last ten years. Alaska Ratepayers believes the best way to provide affordable electricity for the Railbelt, for at least the next 100 years, is the construction of the proposed Susitna project at Watana. His organization also supports the other findings of the AEA "Railbelt Large Hydro Evaluation Preliminary Decision Document." Mr. Wilson said that his organization is a group of informed citizens that over the past two and one-half years has developed the following goals: endorse the governor's proposed appropriation of \$65 million for the FERC application and an additional \$65 million needed to proceed to the construction stage; endorse the appointment of an independent agency for the development, construction, and maintenance of the project by the authorizing legislation proposed by Alaska Ratepayers; endorse the immediate building of a project development fund. Mr. Wilson stated that if the legislature uses the Bradley Lake Hydro model for financing, a project fund of approximately \$2 billion is necessary. The project fund is essential to reach the goal of a basic infrastructure for the future of many Alaskans. He concluded that his organization believes this is an excellent project and wants to be a part of the public dialog.

[3:44:04 PM](#)

SARA FISHER-GOAD, Deputy Director-Operations, Alaska Industrial Development & Export Authority (AIDEA) and Alaska Energy Authority (AEA), Department of Commerce, Community & Economic Development (DCCED), informed the committee that the schedule of the Susitna Hydroelectric Project indicates how much of the project can be completed with the FY 2011 funding limit of \$10 million, and the proposed \$65.7 million appropriation. [The schedule provided in the committee packet was labeled, "Task Name: Susitna Schedule," page 1, dated 1/24/11, and prepared by AEA and Cardno ENTRIX]. She advised that the schedule provides "a high-level approach in how we would get from where we are now to constructing the project, but understanding that there's more detail to be put in here, and there's probably some refinement to go on."

[3:45:44 PM](#)

REPRESENTATIVE TUCK asked Mr. Wilson how Alaska Ratepayers determined an additional \$65 million was needed.

MR. WILSON expressed his understanding that there is a second phase, after the FERC application, during which the regulators begin an environmental impact study (EIS) and which will require a lot of effort on the part of the state. The additional funding would get the project to the start of construction.

[3:47:00 PM](#)

REPRESENTATIVE TUCK then asked whether Alaska Ratepayers wants an independent agency - outside the state - created.

[3:47:20 PM](#)

BILL NOLL, spokesperson, Alaska Ratepayers Inc. (Alaska Ratepayers), said yes. Alaska Ratepayers looked at the possibility of expanding AIDEA or AEA, or resurrecting the Alaska Power Authority for this task; however, the dimension of the project and the national agencies involved warrant an independent entity, with staff that "live and breathe this project and don't ... get distracted when they come to the office with other important projects or programs" Using its members' experience, Alaska Ratepayers drafted legislation toward that end.

[3:50:23 PM](#)

MR. CAREY, in response to Representative Tuck, clarified that the average age of dams currently in operation is 50 years and the average life is unknown.

[3:50:38 PM](#)

REPRESENTATIVE TUCK asked about the effect of siltation on the life of a glacier-fed dam.

MR. CAREY explained that because the lake is almost 39 miles long, most of the silt will drop out; in fact, it was estimated the active storage area of the dam would not be affected for 100 years. He was unsure of the effect on the life of the turbine blades. In further response, he noted that Bradley Lake Hydro is less than 10 miles from the location of glaciers and the runners are not being harmed by silt.

[3:52:21 PM](#)

REPRESENTATIVE TUCK then asked for the distance to the Devil's Canyon phase of the project.

MR. CAREY stated that the original Devil's Canyon project is 30 miles downstream from Watana.

[3:52:35 PM](#)

CO-CHAIR PRUITT asked whether the effects of siltation further down the river, and past the dam, would be a concern during permitting.

MR. CAREY answered that the Chulitna River is the source of much of the silt in the Susitna River and the flow of the Susitna affects the distribution of the silt. Additional studies are needed on this question.

[3:53:39 PM](#)

REPRESENTATIVE GATTO asked whether other dam projects have been considered and rejected.

MR. CAREY answered that one other dam under consideration is located at Glacier Fork - a project that has little water storage and that would provide very little energy during the winter - and any others of significant size in the state have "fish issues." In response to Representative Gatto's question on whether the completion of a gas pipeline will nullify the need for alternative forms of energy, such as hydro, Mr. Carey said the Susitna project will reduce the amount of natural gas needed for power generation, but the utilities will still need gas for power generation in Anchorage and homeowners will still need gas for heating purposes. The Susitna project will reduce the amount of gas needed and will bring the state to the 50 percent renewable energy goal.

[3:55:48 PM](#)

REPRESENTATIVE SADDLER requested information on the ownership and classification of the land surrounding the proposed dam.

MR. CAREY indicated identifying all of the landowners in the area is a task to be completed this year. Known major landowners are: BLM, the Cook Inlet Region, Inc. (CIRI), and

the Tyonek Native Corporation (TNC). Regarding the population, he said there are lodges on lakes in the vicinity, but no one lives where the reservoir would be. In further response to Representative Saddler, he was uncertain whether there are mineral deposits that would be covered by the reservoir.

[3:56:59 PM](#)

REPRESENTATIVE LYNN asked whether the construction of a gas pipeline negates the need for the dam, or "can they work together?"

MR. CAREY expressed the agency's belief that both projects can occur; in fact, even with the dam, gas is still needed. As a matter of fact, if a gas pipeline is built without the hydro, future energy costs will be higher and the state will not reach its goal of 50 percent renewable.

[3:57:57 PM](#)

REPRESENTATIVE GATTO assumed the "all-in" cost is \$5 billion, including the dam and the transmission lines, and asked what the price of electricity delivered to Anchorage or Fairbanks would be.

MR. CAREY advised that the retail price would likely be similar to the present price, depending on the consumers' utility. The project may lower the cost in Fairbanks and retain the same cost in Anchorage; however, the retail price would vary within the region.

[3:58:56 PM](#)

REPRESENTATIVE PETERSEN asked whether the proposed dam is located in a highly seismic area and if an event would put Talkeetna in jeopardy.

MR. CAREY acknowledged that almost all of the state, with the exception of the North Slope, is considered to be a high seismic area and Talkeetna is approximately 90 miles below the dam site. He assured the committee that of tens of thousands of dams around the world, the engineers have found only one failure of a dam and it was actually built on a fault line. There are no fault lines identified under the proposed site.

[4:00:36 PM](#)

REPRESENTATIVE TUCK commented on past proposed dam projects, going back to the 1950's, and opined they were not completed primarily because of fish issues. Hydro power will keep the price of energy level for Anchorage.

[4:02:13 PM](#)

MS. FISHER-GOAD addressed the Alaska Ratepayers' suggestion that an independent agency is necessary to manage the project. She reported that the House and Senate have introduced proposed legislation that will allow AEA to establish a subsidiary corporation for the purposes of owning a specific project. She opined that the agency, although it has a statewide focus, can manage a substantial new project in addition to its existing work. Further, the proposed legislation incorporates a fiscal note to establish and staff a project office.

[4:04:20 PM](#)

MR. NOLL expressed his appreciation for the expertise of Ms. Fisher-Goad and Mr. Harper.

[4:05:12 PM](#)

REPRESENTATIVE GATTO observed that a 40-mile-long lake will be populated with fish in the future. Once the fish are in the lake, he inquired whether agencies charged with the protection of fish will become involved.

MR. CAREY reminded the committee the lake will be very cold and silty. After the license is issued and the dam is constructed, its operation will be unaffected by changing conditions for at least 50 years, until the license is renewed.

[4:07:08 PM](#)

REPRESENTATIVE SADDLER asked for the "downside" of this proposal.

[4:07:20 PM](#)

MR. CAREY explained that the project did not proceed in the 80's because of the lack of financing and an abundance of clean gas from the Cook Inlet. At this time the state is in a better financial position. The downside is that the utilities cannot do this project, or the other generation projects required along the Railbelt, without a contribution of capital from the state.

4:08:11 PM

REPRESENTATIVE SADDLER pointed out the expected life of the dam is 100 years or more, and suggested extending the duration of the bonds beyond 30 years.

MS. FISHER-GOAD advised it is "a bit premature" to talk about financing. She reported the agency discussed whether the state would want to buy the power down assuming a 50 percent capital contribution, or buy the power down to a certain cost at a wholesale rate. She agreed that a 30-year payback could be extended. The agency is studying financing using the "Bradley model" wherein the state participated with 50 percent financing of Bradley Lake Hydro, and the outstanding debt is being paid through a power sales agreement between the utilities and AEA. Under this successful model, after 10 years the utilities will continue to pay. The "Railbelt Large Hydro Evaluation Preliminary Decision Document" has been well received, but there is a lot of work yet to be done; in fact, discussions with various utilities and appropriate departments within the state are underway.

4:11:55 PM

MR. CAREY, in response to Representative Tuck, clarified the chart titled, "Railbelt Demand." In further response, he stated that all of the extra energy produced in the summer by the Watana dam on the Susitna would be sold because, during the time of high output, the utilities would take their other sources of energy off-line for maintenance.

4:13:53 PM

CO-CHAIR FOSTER thanked the presenters.

4:15:05 PM

ADJOURNMENT

There being no further business before the committee, the House Special Committee on Energy meeting was adjourned at 4:15 p.m.