

Susitna-Watana Hydroelectric Project

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Ground Truth Trekking

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Summary

If built, the Susitna-Watana hydroelectric project would be a 600 MW powerhouse downstream of a 30.5 square mile (79 km2) reservoir behind a concrete dam on the upper Susitna River. The total cost of the project is currently estimated (http://www.alaskadispatch.com/article/20130424/oil-tax-cut-doesnt-stop-funding-alaskas-susitna-dam-megaproject) at $5.2 billion, not including an additional $900 million for transmission and integration into the Railbelt (/Issues/Infrastructure/Railbelt-Electrical-Grid.html). The state legislature approved $172 million over several years to begin permitting and feasibility studies, but funding for 2014 was just $10 million. Governor Parnell stated (http://www.alaskapublic.org/2013/12/13/susitna-dam-funding-cut-in-proposed-budget/) the funding reduction, which may well delay permit applications, was in large part because the Alaska Energy Authority (AEA) (http://www.akenergyauthority.org/) wasn't showing sufficient progress in coming to an agreement over land access with native groups.

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The facility would displace a large amount of electricity currently generated from fossil fuels, reduce the need for other generation projects, and provide base load (http://en.wikipedia.org/wiki/Base_load_power_plant) to supplement renewable sources (/Issues/Renewable-Energy-in-Alaska.html) like wind and tidal energy that have variable power output. Critics of the project (http://susitnarivercoalition.org/) cite debatable economics, impacts on fisheries, earthquake risk (/Issues/Renewable-Energy-in-Alaska/susitna-watana-hydropower-seismic-earthquake-hazards.html), viable alternatives (http://susitnarivercoalition.org/impacts/better-energy-sources/), and destruction of pristine wilderness as reasons to oppose the dam. Particularly contentious is the large difference between electricity price estimates produced by the developers and by outside consultants (see below).

In fall 2014, Northwest Power Services (http://www.nwpwrservices.com/) and a new local company Glacial Energy LLC submitted (Northwest%20Power%20Services) initial FERC filings for a smaller (75 MW) dam on the nearby Talkeetna River. Many of the issues and controversy around this proposal are likely to parallel those fromt he Susitna-Watana proposal.

The proposed damsite

THE PROPOSED DAMSITE — Susitna River: From Glaciers to the Sea. Leg 2: Damsite and Devil's — Get Photo (/photos/the-proposed-damsite/)

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History

The hydroelectric potential of the Susitna River was first examined by the US Bureau of Reclamation in 1948. Additional studies took place throughout the next 40 years, culminating in a series of major feasibility studies in the early 1980's. In 1983, the Alaska Power Administration (APA) applied for a hydroelectric permit from the Federal Energy Regulatory Commission (FERC), but the overall price of energy was in decline in the early 1980's and eventually the application was withdrawn, ending all of the ongoing studies. The project gained new life in 2008, when the AEA commissioned a comprehensive review and update of the previous work.

The 1983 FERC application called for two dams, one at Watana and one at High Devil Canyon, that would have provided a combined 1800 MW of electricity. The application was later amended to a "staged" plan to spread out the costs over a longer time period, and estimated to cost $5.9 billion ($12.4 billion in 2012 dollars).

The AEA-commissioned reassessment of the Susitna project examined potential for placing a dam at Watana ($7.02 billion in 2012 dollars) or at High Devil Canyon ($5.74 billion in 2012 dollars). Either alternative was projected to produce around 1200 MW of electricity. Improvements in technology, most notably the option of a roller compacted concrete (RCC) (http://en.wikipedia.org/wiki/Roller-compacted_concrete) dam instead of a traditional embankment dam, reduced costs per MW relative to the 1980's estimate.

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During the summer of 2011, the Alaska state legislature appropriated $66 million in funds (http://www.legis.state.ak.us/basis/get_bill.asp?bill=SB%20%2042) to move the Susitna project forward following two important events in 2010: the passage of a bill requiring that 50% of Alaska's electricity come from renewables by 2025, and the stated strong preference (http://www.circleofblue.org/waternews/wp-content/uploads/2011/07/AEA_Railbelt-Large-Hydro-preliminary-report.pdf) of the AEA for the Susitna project over the Chakachamna hydro project (/Issues/Renewable-Energy-in-Alaska/chakachamna-hydro-lake.html).



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WATANA CREEK — Susitna River: From Glaciers to the Sea. Leg 2: Damsite and Devil's — Get Photo (/photos/watana-creek/)

Location, Economics, and Capacity

The current project plan (http://www.circleofblue.org/waternews/wp-content/uploads/2011/07/AEA_Railbelt-Large-Hydro-preliminary-report.pdf) calls for a single dam at Watana capable of generating 600 MW (2600 gigawatt hours annually) of power at an estimated cost of $5.2 billion. This would provide for about 50% of the existing needs of the Railbelt. This project alone might be enough to achieve the state's official goal (http://solar.calfinder.com/magazine/alaska-renewable-energy-goal-50) of 50% renewable power by 2025.

The site is about 50 miles northeast of Talkeetna, which puts it about halfway between Anchorage and Fairbanks. It could be accessed by a new road from the Denali Highway and/or a new rail line from Gold Creek. The dam would be around 700 feet tall and create a reservoir of 39 miles long, up to 2 miles in width at the widest point, covering an area of 30.5 square miles. One issue that has yet to be resolved is the question of land ownership (http://www.frontiersman.com/news/state-lacks-access-to-susitna-dam-lands/article_06f1eeb4-35bf-11e1-94dc-001871e3ce6c.html). Much of the land to be flooded as well as the dam site itself are owned by Native corporations and no access agreements have yet been established.

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Costs
to construct transmission lines and substations have been estimated (http://www.arlis.org/docs/vol1/Susitna2/1/SuWa193.pdf) 14 MB at an additional $889 million to fully integrate the project into the Railbelt grid.

The price of electricity to be generated from the project is a major debate between proponents and opponents of the dam. The AEA estimates (http://www.circleofblue.org/waternews/wp-content/uploads/2011/07/AEA_Railbelt-Large-Hydro-preliminary-report.pdf) the **wholesale** price of electricity from the project to be 6.3 cents per kWh. This assumes 50% state financing, a lifetime of 50 years, and doesn't specify the year that electricity would be this price. A 2012 report (http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.261.2584&rep=rep1&type=pdf) from the Institute of Social and Economic Research (ISER) concluded that the **retail** price of electricity would be up to 40 cents per kWh. This assumes no state financing and is only for the first year, with costs eventually dropping (also over a 50 year lifespan). An apples-apples comparison (50 year life, 50% state financing) shows the price of wholesale electricity as being either 6.3 cents/kWh (AEA, unknown year) or 8-18 cents/kWh (ISER, depending on year). The ISER analysis also assumes that the remaining 50% would be entirely financed by loans to utilities, but it is possible federal grants or further state assistance could reduce this amount and the cost of power.

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Another complicating factor in the economic analysis is the lifespan of the project. The average projected lifespan of dams in the U.S. is 50 years, but many dams last longer than this. For example
the Hoover Dam was completed in 1936 and as of 2011 was expected (http://www.acwa.com/news/federal-relations/president-signs-hoover-dam-power-allocation-act) to produce power until at least 2067. The longer a dam is kept in operation, the lower the total cost of power will be, but the risk of dam failure also increases with age.

Environmental/Safety Concerns

Significant environmental/safety concerns with the Susitna hydro project include seismic risk (/Issues/Renewable-Energy-in-Alaska/susitna-watana-hydropower-seismic-earthquake-hazards.html) and the impact on fisheries. Other concerns, more general to all hydropower projects, are destruction of wildlife habitat, aesthetic losses, and the production of methane as a greenhouse gas. Opposition to the project (http://susitnarivercoalition.org/) has focused mostly on the impacts on fisheries and the cost of the project.

Fisheries

The proposed dam would have a complex impact on fisheries. For example, rearing Chinook salmon have been reported in two tributaries (Kosina Creek and Oshetna River) upstream of the dam site. These populations would be destroyed by the

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upstream inundation of the dam. Additionally, several miles of Arctic grayling spawning habitat are expected (http://www.circleofblue.org/waternews/2011/world/alaska-governor-authorizes-4-5-billion-dam-project/) to be negatively impacted by the reservoir. The presence of the dam would also change the downstream temperatures, flow rates, and sediment levels in the river, and the combination would likely help some fish species and hurt others. The reservoir itself would provide new habitat for fish that prosper in lakes. Downstream effects on the salmon population are difficult to predict in detail. For example, the lower summer flow rates may reduce the amount of salmon spawning habitat, but the increased winter flow and temperature may increase overwinter survival rates.

Current Status

During the summer of 2011, the Alaska state legislature appropriated $66 million for feasibility studies and to begin preparing for a FERC application. AK Governor Parnell suggested that the project could be complete in 2023. This timeline allows around six years for permitting and five years for construction.

The governor also announced (http://www.renewableenergyworld.com/rea/news/article/2011/07/susitna-dam-hydroelectric-project-moving-ahead-in-alaska) in July 2011 that the AEA is actively preparing to file the FERC application, detailed mapping of the project site is underway, and the Department of Fish and Game is assessing fish populations in the area. The official pre-application to FERC

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was submitted (http://www.petroleumnews.com/pnads/541811353.shtml) in January 2012. Public meetings were held (http://susitnarivercoalition.org/wp-content/uploads/2012/03/FERC-Scoping-Document.pdf) throughout March 2012. The AEA proposed (http://www.akbizmag.com/Alaska-Business-Monthly/July-2012/Susitna-WatanaHydroelectric-Susitna-Watana-Hydro-Proposed-Study-Plan-Filed/) an official study plan in July 2012.

In April 2013, the state legislature approved almost $95 million in addition funding and the FERC gave approval (http://www.huffingtonpost.com/2013/04/25/susitna-watana-dam-alaska_n_3156989.html) for the project to proceed. Research in the area was underway (http://juneauempire.com/state/2013-09-22/research-hydro-project-continues-susitna-drainage#.UkSCLhDgLVo) throughout the summer and fall of 2013. However, the 2014 state budget saw (http://www.alaskapublic.org/2013/12/13/susitna-dam-funding-cut-in-proposed-budget/) a huge cut in funding for the project, due to a lack of progress on land agreements in the area. In December of 2014, the incoming state administration halted work onthis and 5 other large infrastructure projects (http://gov.alaska.gov/Walker/press-room/full-press-release.html?pr=7050), citing budget concerns. This project was exempted from the freeze (http://www.hydroworld.com/articles/premium-content/2015/07/alaska-spending-thaw-to-resume-ferc-licensing-studies-for-600-mw-susitna-watana-hydro-project.html) in July 2015. [MW]: megawatt [FERC]: Federal Energy and Regulatory Commission *[AEA]: Alaska Energy Authority

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Further Reading

> Susitna-Watana Hydroelectric Project website (developed by AIDEA) (http://susitna-watanahydro.org/)

> Alaska State Legislature, Senate Bill 42, funding for the current version of the project (http://www.legis.state.ak.us/basis/get_bill.asp?bill=SB%20%2042)

> Alaska Resources Library & Information Services (ARLIS) page of reports on the Susitna Hydroelectric Project (1979-2010) (http://www.arlis.org/resources/susitna-watana/)

> "Railbelt Large Hydro Evaluation: Preliminary Decision Report" prepared by AEA (2010) (http://www.circleofblue.org/waternews/wp-content/uploads/2011/07/AEA_Railbelt-Large-Hydro-preliminary-report.pdf)

> Regional Integrated Resource Plan (RIRP) Final Report, Part 6. Appendix A "Susitna Analysis" (2010) (http://www.akenergyauthority.org/Content/Policy/RegionalPlanning/Documents/AlaskaRIRP-Section6.pdf)

> Ground Truth Journey - From Glaciers to the Sea: Following the Entirety of Alaska's Susitna River (http://www.groundtruthtrekking.org/Journeys/Glaciers-To-The-Sea-Susitna-Dam.html)

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