

Scammon Bay Hydro Design & Engineering

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| Grantees | City of Scammon Bay (Local Government) |
| Technology Type | HYDRO |
| Region | Lower Yukon-Kuskokwim |
| AEDG Project Code | 10354 |

REF Grants Received

| Round | App | Grant Title | Grant # | AEA Project # | Phase | Start Date | End Date | Status |
|-------|-----|--|---------|---------------|--------------|------------|----------|--------|
| 5 | 847 | Scammon Bay Hydro Design & Engineering | 7050847 | 407092 | Final Design | 7/1/12 | 12/31/14 | Active |

Grant 7050847: Scammon Bay Hydro Design & Engineering

Project Scope: The City of Scammon Bay will use the \$80,793 Round V Renewable Energy Fund grant, and \$2,793 of in-kind matching funds, to assess the feasibility of and prepare conceptual design drawings of a 331 kW run-of-river hydroelectric power project on Ekashluak Creek to serve the community. Ekashluak Creek is located in the Askinuk Mountains, eleven miles west of Scammon Bay. The City and hydro site are located in the Yukon Delta National Wildlife Refuge. The power system in Scammon Bay is owned and operated by Alaska Village Electric Cooperative (AVEC). AVEC and several other entities provided letters of support for the grant. Hydroelectric development for Scammon Bay has been studied several times in the past. The most recent study was completed in 2003. That study found that a hydroelectric project at Ekashluak Creek could reduce diesel electrical generation significantly. Stream gage data was collected for 13 months at 2-hour intervals and indicated flow near the mouth of the creek ranged from 11 to 78 cfs. The project was estimated to cost \$3.68M (2003 dollars) and annually generate up to 2.5 GWh, of which approximately 1 GWh was useable. It is possible more of this excess energy could be used in Scammon Bay today. The proposed Ekashluak Creek project has risks that need to be understood and some remaining unanswered questions that this study can help to resolve. This feasibility study will address, but it is not limited to, the following: anadromous or resident fish presence in the affected reach of the creek, suitability of geology at the proposed project intake and powerhouse sites, access to the project area for construction and system maintenance, transmission line routing, agency lead if the project moves on to licensing and permitting, the projects current economics, and estimated cost of power in comparison to diesel generation. The study will also complete conceptual design of the proposed project. If the study of Ekashluak Creek does not appear to be a viable site for hydroelectric development, a second smaller stream, which is located near Scammon Bay and serves as the source of the community water supply, can be reviewed for its hydroelectric potential. This stream has been studied as a potential hydroelectric power site in the past. Additionally, a new road recently constructed east of town may provide access to alternative hydropower sites that can also be investigated in this study. The City of Scammon Bay intends to designate Alaska Native Tribal Health Consortium (ANTHC) as its agent for the purposes of accomplishing the tasks funded by this grant. The hydropower engineering for this grant is expected to be conducted by an engineering consultant whose resume was provided in the application.

Project Status: The Grantee completed the work and issued a final feasibility report titled Hillside Creek Project, Final Draft Report For Hydroelectric Feasibility Study, Scammon Bay, AK, ANTHC 14-C-81313, Rev. 0, September 15, 2014.

The report found that the Hillside Creek hydroelectric project is a viable addition to electric generation in Scammon Bay that should be investigated further through design and permitting efforts. The proposed project resulting from the report has the following configuration:

Intake Watershed Area 0.73 sq mi Static Head 480 ft Hydraulic Capacity 6.0 cfs Pipeline Length 4300 ft Pipeline Diameter 16 in Transmission Length 0 mi Min Operational Flow 0.45 cfs Net Efficiency 82% Nominal Capacity 188 kW Annual Energy Potential 755,790 kWh Displaced Diesel Energy 646,537 kWh

Future work should include a focus on stream flow data collection, conceptual design improvement, community and other stakeholder consultation, initial permitting actions, land acquisition, potable water system integration, and compatibility and economics with wind generation and diesel heat recovery projects. Project design would follow if it is decided to construct the project.

The hydrology data is not adequate to recommend a project size for final design and permitting. Collection of stream flow data on Hillside Creek will be required if the project proceeds to design and permitting. It is recommended to install a stream gauge and collect 2 to 3 years of flow data for project design and permitting.

| As of Nov. 30, 2013 | Budget | Expenditures |
|----------------------------|--------------------|---------------------|
| Renewable Energy Funding | \$80,723.00 | \$79,636.86 |
| Other State Funding | \$0.00 | \$0.00 |
| Total State | \$80,723.00 | \$79,636.86 |
| Required Local Match | \$2,793.00 | \$2,792.63 |
| Federal Grant Funding | \$0.00 | \$0.00 |
| Total Project Costs | \$83,516.00 | \$82,429.49 |