UAF 11-0017
NENANA, ALASKA HYDROKINETIC RIVGEN™ POWER SYSTEM

PROGRESS REPORT: 1Q2011

MARCH 15, 2011

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Progress Report: FY 2011, 1st Quarter
Submitted: March 15, 2011

1. Total Project Funding

Denali Commission	$830,325
ORPC Alaska	$1,128,449

2. Updated schedule and milestone information as identified in the Project Work Plan

Project Deliverables

- AHERC foundation and debris diversion literature surveys, data collection and final reports:

  Foundation Study Deliverables
  AHERC is no longer performing a foundation study for the project. ORPC is utilizing third party engineering resources to complete the design.

  Debris Study Deliverables
  Draft report delivered to ORPC on January 18, 2011. Final report with appendices still to come. Work on Debris Detection System conceptual design has begun.

- ORPC environmental and site characterization data collection for project design and FERC draft license application:

  The TerraSond report on the Nenana geophysical work was completed and submitted to ORPC on January 6, 2011, this included a detailed analysis of the bathymetry, ADCP current velocity, and sub-bottom data collected during the 2010 field season. This report is available upon request but has not been included in this report due to the large file size.

- Prototype bottom support frame and debris diversion system fabricated, deployed, tested, and retrieved at Nenana site:

  The prototype bottom support frame is currently under design. The debris diversion system design and construction is dependent on debris data that will be collected during the 2011 field season, so it has not begun at this time.

- Additional field work required for FERC final pilot license application:

  ORPC is participating in a meeting facilitated by AEA including key agency personnel form ADF&G, NMFS, and others at the ADF&G offices in Fairbanks on March 31, 2011 to scope required fish studies for the project permitting and licensing.

- FERC Final License Application submitted by December 31, 2011:

  No work to report

- RivGen™ TGU built and tested at Eastport, Maine test site:

  RivGen™ Generator is under final design.

- Final Report on Nenana site characterization work and foundation system and debris diversion system performance:

  No work to report

- Final performance report on RivGen™ TGU test in Maine submitted to ACEP:

  No work to report

TimeLine

- AHERC foundation and debris diversion literature surveys, data collection and final reports completed December 31, 2010 (now anticipated December 31, 2011):

  Foundation Study Timeline

November 2010 - December 2011	The foundation study has been removed from the AHERC scope of work due to the loss of the key faculty performing the work. It will no longer be performed as part of this project.

  Debris Study Timeline

November 2010 - December 2010	Review literature and existing debris mitigation technology and engineering.
December 2010 - January 2011	Provide results from literature review to ORPC about existing debris mitigation methods to help their design of a preliminary mitigation system. Provide preliminary concept designs for debris detection grate system.
November 2010 - April 2011	Design methods and equipment to measure debris statistics in conjunction with the foundation design study.
January 2011 - June 2011	Consult with ORPC on debris detection system during construction and installation.
June 2011 - September 2011	Measure debris statistics data from the debris detection system and other available instruments.
October 2011 - December 2011	Analyze data from the measurement program and approach, and provide data to ORPC for their debris mitigation system design for their 2012 demonstration. Prepare and deliver final reports.

- ORPC environmental and site characterization data collection for project design and FERC draft license application performed by October 1, 2010:

October 10, 2010	TerraSond geophysical field work completed.
January 6, 2011	Final report on geophysical work submitted to ORPC.

- Prototype bottom support frame and debris diversion system fabricated, deployed, tested and retrieved at Nenana site, July – September 2011:

  March 1, 2011 — PND selected to design bottom support frame design

- Additional field work required for FERC final pilot license application completed by October 31, 2011:

  March 31, 2011 — Meeting scheduled with Agencies in FAI to scope fish studies for project

- FERC final pilot license application submitted by December 31, 2011
- RivGen™ TGU built and tested at Eastport Maine test site by December 31, 2011
- Final Report on Nenana site characterization work and foundation system and debris diversion system performance submitted to ACEP by December 31 2011
- Final performance report on RivGen™ TGU test in Maine submitted to ACEP by February 15, 2012

3. Narrative Summary

AHERC work

ORPC has submitted a contract, which includes an IP agreement, to AHERC for signature on March 7, 2011. It is currently under review by their attorney.

The UAF faculty member who was assigned to provide the literature survey and design advisement on the RivGen™ bottom support frame has removed himself from the project. This put the RivGen™ bottom support frame work behind schedule. AHERC has agreed to reapportion $44,842 of their Denali Commission EETG subaward to ORPC to allow ORPC to find another contractor for this work. This will leave $147,158 in the budget for AHERC to complete their debris study and debris data collection efforts. ORPC received a draft report on debris diversion structures from AHERC, which provided good information on the problems and issues facing us. We are awaiting the final report complete with appendices detailing the current state of the art in diverting river debris. AHERC was unable to collect debris data during the 2010 field season, as EETG funds were not available to the project in time to release them to begin the work in 2010. AHERC is currently working on the design of a debris detection system to install with the Bottom Support Frame and collect debris data in 2011.

RivGen™ Bottom Support Frame

With UAF no longer contributing to bottom support frame and foundation design work, ORPC had to add additional engineering resources to perform this work. After considering in-house and outside resources for this work, ORPC selected PND Engineering in Anchorage, Alaska, as the primary contractor for this work. ORPC produced a RivGen™ Bottom Support Frame Design requirements document to guide PND in their work and help them develop an accurate quote (see attached). PND delivered a quote within budget for the work and has since begun preliminary design work on the bottom support frame and anchoring/attachment system.

Geophysical Information

Geophysical information collected by TerraSond for the Nenana project site was submitted in a final report to ORPC on January 6, 2011 and is now available using a Fledermaus viewer

program. We are working with SGC Engineering, LLC to import this data into an ARC GIS format, which is easier for us to use. We are processing river stage information from the U.S. Geological Survey to understand how to apply the river heights to the bathymetry data that we have collected.

ORPC also consulted with Michael Baker Corp, an Anchorage-based engineering firm who was recently completing a core sample job on the Tanana River near the project site as part of a proposed gas line project. ORPC investigated the possibility of taking advantage of the mobilized equipment to perform concurrent geotechnical samples at the project site. It was determined, based on engineering requirements and the cost of the work, that it was neither required nor within the budget for this project to complete this work. Core samples, therefore, were not taken at the project site. PND engineering is comfortable designing a bottom support frame and attachment system without this information.

RivGen™ TGU

The design of the RivGen™ turbine generator unit (RivGen™ TGU) is proceeding in parallel with ORPC's TidGen™ TGU design work at Comprehensive Power Inc (CPI). ORPC held a mini-design review with CPI to discuss the RivGen™ TGU electronics arrangement and decided to continue with the arrangement suggested by CPI and to keep power electronics connected directly to the generator underwater. The primary rationale for this choice is to keep control signals close to and integrated with the generator rather than transferring data to shore for processing, and then transmitting control signals from shore.

4. Before and After Pictures

None at this time.

Total Project Expenditures for the Project as of the end of the Reporting Period

Two expenditures from TerraSond for a total of $80,000 have been made on this Project as of the end of the reporting period, March 15, 2011.

Modified Budget

ORPC may submit a modified budget if necessary after executing a subcontract with AHERC and making changes to the over all grant agreement with ACEP, but at this time we have no budget modifications.