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## INSTRUCTIONS FOR COMPLETING SF 298

### 1. REPORT DATE.

Full publication date, including day, month, if available. Must cite at least the year and be Year 2000 compliant, e.g. 30-06-1998; xx-06-1998; xx-xx-1998.

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## **N000141712022 : Building a Clean Energy Workforce in Alaska through the Alaska Network for Energy Education & Employment (ANEEE)**

**Reporting Period:** JUN 16, 2019 to JUN 15, 2020

**Report Type:** Final Report

**Submitter:** Chris Rose

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### **Major Goals**

Task 1) Identify and map energy stakeholders and missions of the various K-12, vocational training, and university programs and curricula across Alaska. Task 2) Organize the above information into a format that is useful and accessible to organizations, agencies, businesses, educators, students, and parents. Task 3) Perform a gap analysis on those programs and curricula and catalogue successful models from other jurisdictions. Task 4) Convene the energy education stakeholders revealed in Steps 1 and 3 to communicate the gap analysis and ask industry about what kinds of employees and skill sets it needs. Collaboratively develop new draft vocational training and curricula ideas, as well as an overall strategy to begin connecting them together. Task 5) Develop metrics to evaluate proposed new training and curricula. Task 6) Discover funding to pilot and evaluate new training and curricula. Task 7) Promote awareness of programs and resources to educators, students, parents, businesses, state and federal agencies and other interested parties, pulling them into a growing ANEEE network. Task 8) Continue to periodically convene stakeholders to build both regional and sector specific networks.

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### **Accomplishments Under Goals**

Chris McConnell, Director of the Alaska Network of Energy Education and Employment (ANEEE) continues to work within three major sectors of the Alaskan energy literacy and training landscape: K-12, Career & Technical Education (CTE) and University. During this reporting period Mr. McConnell has updated the ANEEE Alaska Clean Energy Gap Analysis – a “living” document that describes the current needs and trends in energy literacy and training within Alaska. Mr. McConnell has presented on aspects of the Gap Analysis to private business, university faculty, workforce development committees, school districts, trade groups and K-12 students. (Tasks 1, 2, 3) This ANEEE Gap Analysis serves as a road map as to how and where ANEEE might best direct information, create partnerships, facilitate convenings, and help direct resources that fill identified gaps.

Accomplishments this reporting period include the piloting of the use of 3D photospheres of rural Alaskan powerhouses that can serve as asset management, troubleshooting and training tools. (Tasks 2,3, 4, 5,6). As a result of this ANEEE effort, Alaska Energy Authority (AEA) has now adapted this 3D photosphere technology in mapping the nearly 300 isolated microgrid powerhouses throughout rural Alaska. ANEEE partnered with Anchorage based private imaging firm TotalView in the creation of the 3D photospheres that will also be included in Alaska Vocational Technical Center’s (AVTEC) Power Plant Operator and Bulk Fuel curriculum. (Task 7). Mr. McConnell has convened representatives (Tasks 2, 4) of regional energy stakeholders, independent utilities and electric coops, state agencies, federal agencies, Alaska Native organizations and various educational institutes in an effort to disseminate the widespread application of 3D photospheres to increase

human capacity in the energy sector. Beneficiaries of these ANEEE efforts include Bristol Bay Native Association, Bristol Bay Native Corporation, Calista Corporation, Alaska Native Health Consortium, Kawerak, Alaska Housing Finance Corporation (AHFC), Lower Yukon School District, Lake and Peninsula School District, Lake and Peninsula District, Department of Energy, Office of Indian Energy, Denali Commission, University of Alaska, Fairbanks, Alaska Center for Energy and Power (ACEP).

Mr. McConnell has been instrumental in the formation of the Bristol Bay Energy Training Coalition – a network of energy stakeholders in the Bristol Bay region that is exploring the formation of a “shared services” model that will address longstanding challenges in the operation and maintenance of rural microgrids. This coalition draws from the ANEEE Gap Analysis (Tasks 1,2,3) in identifying areas of operation and maintenance that might benefit from coordinated in region trainings and expanded technical assistance. (Tasks 5,6,7, 8) In collaboration with Alaska Center for Energy and Power and as part of the ONR ARCTIC partnership,, Mr. McConnell was a primary organizer of the Iliamna Hybrid Microgrid Power Plant knowledge sharing workshop. (Scheduled – though postponed due to COVID-19.) The workshop is currently being retooled for potential distance digital delivery of some learning modules. The workshop included utility managers and clerks from nine rural Alaskan villages seeking increased capacity in business management of diesel power plants with integrated renewables. (Tasks 4, 5, 6, 7, 8).

Mr. McConnell partnered with the University of Alaska, Campus of the Interior, the Kusilvak Academy, King Tech High School and the Lower Yukon School District in the creation of a for college credit CTE class in the repair of oil burning home heating stoves. This course provided energy literacy training for rural high school students to address the high cost of home heating, it made visible career pathways in energy efficiency and created a template that might be used by other K-12 school districts in the pursuit college credit CTE programs. (Task 4, 5, 6, 7, 8).

Mr. McConnell partnered with the Anchorage Museum, AHFC, King Tech High School, Anchorage School District, International Brotherhood of Electrical Workers (IBEW), Anchorage Municipal and Light and local Anchorage tradesman and entrepreneurs in building technology to create workshop that would give hands on experience to high school CTE students looking to understand the fundamentals of building science. These members of ANEEE collaborated in installing various energy sensors throughout a museum building known as the SEED Lab and creating hands on curriculum and digital tools that enable students to gain a holistic sense of energy flow throughout a building. The series of workshops have been delayed by COVID-19 – all partners are standing by to resume when appropriate.

Mr. McConnell has been instrumental in the development of a “Project Development” tract that serves both high school students in the Lake and Peninsula District and students in the University of Alaska, Bristol Bay’s Sustainable Energy Program. This capstone course is intended to provide practical knowledge in the implementation and management of rural energy projects. Tasks 3,4,5,6,7).

Mr. McConnell has worked with AVTEC instructors in the development of digital delivery of a Bulk Fuel Training program and with private contractors in the development of digital curriculum for Utility Management Training. This curriculum development draws on insights from the ANEEE Gap Analysis in the use of best practices for distance learning. (Tasks 2, 3, 5, 7).

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## **Plans Next Period**

ANEEE received a COVID-19 extension through June, 2020 – though the expectation is that the work under the current ANEEE ONR grant will be closed out before that time.

At the earliest, safest opportunity – Mr. McConnell plans to resume convenings, workshops and other efforts that were underway - but delayed by the COVID-19 outbreak. These include Hybrid Power Plant Workshops and CTE/K-12 Building Science workshops in collaboration with the Anchorage Museum and Anchorage School District.

Mr. McConnell plans to redevelop the ANEED website with updated mapping tools so that it might more efficiently distribute the ANEED Gap Analysis, make clear clean energy training and career pathways and as an information resource for those teaching, learning and working in the energy sector.

Mr. McConnell plans to continue to work closely with REAP Energy Educators to map and strategize for future convenings amongst Alaska’s disparate STEM education efforts that will help define and form a statewide STEM Ecosystem. This effort includes an effort to create the Alaska Energy Ecosystem Map – an ArcGIS and 3D photosphere tool that will include energy curriculum and training opportunities, energy infrastructure and energy career pathways in Alaska. (Tasks 2,3,4,5,6,7,8).

Mr. McConnell plans to continue to work with TotalView in the creation of 3D-photospheres that can be used as synchronous and asynchronous teaching and training tools for students and teachers in the K-12, CTE and university sectors.

Mr. McConnell is currently leading efforts to convene a wide range of stakeholders interested in utilizing a specific USDA grant program (504) to foster weatherization and workforce development in rural Alaska. (Tasks 4,6,7).

Mr. McConnell will continue to map energy training through his work on the ANEED Gap Analysis and utilize his latest findings to convene and collaborate with energy stakeholders – in an effort to make visible and improve energy training and literacy opportunities to Alaskans throughout the state.

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### **Results Dissemination**

Mr. McConnell has utilized the ANEED website, in person and digital presentations, convenings, classroom visits and email to disseminate the ANEED Clean Energy Gap Analysis. In addition Mr. McConnell has been instrumental in creating an online Clean Energy Resource Library on the REAP website that serves as an archive for STEM and clean energy efforts throughout the state of Alaska.

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### **Honors and Awards**

Nothing to Report

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### **Training Opportunities**

Nothing to Report

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### **Technology Transfer**

Nothing to Report

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**Participants**

<b>Name</b>	<b>Role</b>	<b>Person Months</b>
McConnell, Chris	Co-Investigator	12