Nuyakuk River Hydroelectric Project (FERC No. 14873)
Public Meeting #1
September 21, 2021
1:00 PM – 4:00 PM (Alaska Time)

Introductions and Meeting Overview

Mr. Cory Warnock (McMillen Jacobs Associates) welcomed all participants to the meeting and provided an overview of the meeting purpose and logistics. Mr. Bob Himschoot (Nushagak Cooperative) introduced himself as the General Manager and CEO of Nushagak Cooperative. He thanked all of the attendees and stated that the recent abeyance period has been a very productive time for the Project.

Mr. Will Chaney (Nushagak Cooperative) introduced himself as the Electric Operations Manager for the Project and provided the participants with the meeting intent and an overview of the topics to be discussed throughout the meeting. Mr. Chaney provided the participants with a summary of the Project need and purpose, and the Cooperative's reasons for pursuing the feasibility studies.

Mr. Kevin Jensen (McMillen Jacobs Associates) introduced himself as the lead Civil Engineer for the Project and stated that he will be speaking to Project design and conceptual lead during the meeting.

Mr. Charles Sauvageau (McMillen Jacobs Associates) stated that he is the technical lead for water resources studies during the meeting and also serves as the Study Program Coordinator for the Project.

Dr. Dudley Reiser (Kleinschmidt Associates) stated that his role is a technical lead for instream flow and fish passage studies.

Dr. MaryLouise Keefe (Kleinschmidt Associates) stated that her role is a technical lead for fisheries studies.

Mr. Bryan Nass ((Bristol Bay Science and Research Institute) (BBSRI)) introduced himself as a Fisheries Ecologist for BBSRI and has been working on plans for Project fisheries studies.

Mr. Cory Warnock provided participants with a summary of past Project milestones, including an initial feasibility assessment, acquisition of a Federal Energy Regulatory Commission (FERC) Preliminary Permit, the Alaska State Senate approval of Senate Bill 91, the filing of an (Notice

of Intent/Pre-Application Document) NOI/PAD with FERC, followed by the initial FERC scoping process.

Mr. Cory Warnock described the progress made during the past 16 months during the FERC abeyance. During that time, the ARWG was formed and numerous ARWG meetings have occurred. Based on the collaboration of the ARWG, the Cooperative and technical experts have revised and refined the Proposed Study Plan (PSP).

Conceptual Layout Overview

Mr. Kevin Jensen (McMillen Jacobs Associates) provided an overview of the Project design layout. At this point, the Project design consists of a 750-ft long tunnel, powerhouse, 2 Kaplan-style turbines, an open tailrace channel (approx. 450 ft), and transmission lines extending to outlying villages and Dillingham. Maximum generation is estimated at approximately 10-12 megawatts. The average annual energy would be approximately 55,000 – 70,000 megawatt-hours annually. The Project will be run-of-river, with inflow managed with outflow. Generation will be maximized during high flow months, which coincides with primary fish processing demand in the region. The Project will be managed so that reliance on diesel is eliminated for a majority of the year. Mr. Jensen stated that having a USGS gage just upriver from the Project location has been immensely helpful in initial Project design. Mr. Jensen displayed a map of the initial Project layout and described the facilities shown. Mr. Cory Warnock mentioned that the length of the bypassed area of the Nuyakuk River (Nuyakuk Falls) is only approximately 0.5 miles and doesn't contain high-quality fish spawning and rearing habitat. Fish passage through this area is the primary focus rather than spawning and rearing habitat. Mr. Jensen also spoke about the geotechnical study needs and that tunnelling is the preferred option rather than above-ground installation. Mr. Warnock shared a video flyover of the Project area that was taken on May 8, 2020. Mr. Kevin Keith (Alaska Department of Fish & Game)(ADFG)) asked what the flow rate was during the video, and Mr. Will Chaney stated that it was a relatively low-flow period.

Mr. Todd Rinaldi (ADFG) asked what the water temperature would be coming out of the Project. Mr. Kevin Jensen stated that the water will pass through the turbines and that the travel time through the tunnels is relatively short and would not result in increases to water temperature.

Ms. Molly Welker (United Tribes of Bristol Bay (UTBB)) asked when the video was taken and Mr. Warnock confirm that it was taken in early to mid-spring.

Ms. Kay Andrews (City of Dillingham) asked how the Cooperative can be sure that once a tunnel is cut that the portion of land doesn't erode over time, and Mr. Kevin Jensen responded that erosion is a surface phenomenon and that this type of geotechnical work wouldn't result in erosion. Subsidence is a more common issue with tunneling. The geotechnical engineering will be responsible for ensuring that subsidence doesn't occur.

Mr. Sean Eagan (National Marine Fisheries Service (NMFS)) asked that if a steel pipe on the surface is cheapest, why not proceed with that design. Mr. Kevin Jensen stated that he didn't think it would be the cheapest option. If the tunnel ran over the ground surface, a large priming pump would be required due to the hill.

Mr. Mischa Ellanna (Bristol Bay Native Cooperation (BBNA)) asked for the location of the existing portage trail. Mr. Cory Warnock showed Mr. Ellanna where the portage trail appeared on the screen.

Ms. Kay Andrews asked how the Cooperative can be sure that the river flows that have been described will actually occur in the future. Mr. Cory Warnock stated that having a nearby long-term flow record is very helpful with confidence surrounding the flow and that examining future flows will be a component of the study program.

Mr. Mischa Ellanna asked if anything would be required to keep fish from entering the tailrace. Mr. Cory Warnock and Mr. Kevin Jensen responded that the study program would assess issues such as attraction flows and that a fish exclusion barrier or operational constraints would be used as needed to prevent fish from entering the tailrace channel.

Mr. Charles Sauvageau added that in regard to the water temperature question, at a recent project in Washington state that he's worked on, water travels 5-6 miles through an unlined tunnel and water temperatures increase only 0.5 degrees Celsius. Similarly, at the Allison Creek project in Valdez, water travels through a metal-lined tunnel for 4-5 miles and water temperatures do not increase at all.

Mr. Kevin Keith asked if he could have the exact date of the video to look up the flow.

Mr. Mischa Ellanna stated that the transmission line passes near a mountain that has a large magnetic anomaly and asked if that would have any effect on the transmission of electricity in that area. Mr. Kevin Jensen stated that he thought it would not have any effect, but he would follow up.

Ms. Kay Andrews asked if there were any other projects in the country similar to this one. Mr. Cory Warnock responded that every project is somewhat unique, but the components of the Project are relatively common and that the Project footprint is small. Mr. Kevin Jensen added that the site is unique due to the presence of Nuyakuk Falls, but the components are not.

Mr. Cory Warnock spoke further about the unique Project considerations, including the small Project footprint, extensive transmission linkages, the potential to eliminate diesel generation in the region, and the challenges associated with working on Nuyakuk Falls.

Mr. Will Chaney described a video taken on July 12, 2021, which shows fish moving and jumping in Nuyakuk Falls during a relatively high flow time (close to 12,000 cfs). At the time of the video, Mr. Chaney witnessed high numbers of fish attempting to pass through Nuyakuk Falls, with many falling back down due to the high flows.

Regarding impact of magnetic mountains on high voltage transmission, Mr. Kevin Jensen provided a response from one of McMillen Jacobs Associates electrical engineers: In the absolute worst case, there could be some nominal voltage fluctuations. However, that would depend on the strength of the magnetic field and the linear length of said field. Given the height of high voltage transmission lines and the long wavelength of electric fields on power systems, it would in all likelihood have no measurable effect.

Nuyakuk Project Proposed Study Program

Mr. Cory Warnock described key developments during the past year, including COVID-related issues, the FERC abeyance, continued refinement of the conceptual Project design, collection of baseline data, and the formation of the Aquatics Resources Working Group (ARWG). He stated that green Light Detection and Ranging (LiDAR) data was collected for the study area in July 2020. The baseline dataset allows for analysis that will be instrumental in completing various aquatic and fisheries studies. Seasonal aerial photo and video collection was also conducted during this time.

Mr. Cory Warnock described the formation and activities of the ARWG, including extensive technical consultation and a series of meetings that have occurred since October 2020. The ARWG will continue to exist throughout the licensing process and into license implantation and compliance.

Mr. Cory Warnock described the process that has occurred to revise the Proposed Study Plan (PSP) in close collaboration with the technical experts of the ARWG. The study program will provide the data to allow for the analysis necessary to determine if the Project is feasible from a natural resource and financial perspective. Mr. Warnock stated that the PSP would be distributed to the entire Project stakeholder list and introduced the list of all studies contained in the PSP.

Aquatics/Fisheries Resources:

Mr. Bryan Nass stated that structural and operational features of the proposed Project have a direct connection (or nexus) to the fish and aquatic resources of the Nuyakuk River. He provided an overview of the fisheries and aquatic resources studies that have been developed to assess potential impacts and risk to fish populations.

Dr. MaryLouise Keefe described the Fish Community study, which will be conducted to understand what fish species use habitat in the Project area, and how they're behaving when they pass through the Project area.

Dr. Dudley Reiser provided an overview of the Fish Passage Assessment and how 2D modeling would be used to evaluate the likelihood of fish migration through corridors/pathways through Nuyakuk Falls based on fish leaping and jumping criteria.

Dr. MaryLouise Keefe spoke about the Fish Impingement and Entrainment Studies, which is designed to evaluate what the potential is for the Project to entrain fish in the vicinity of the intake.

Dr. MaryLouise Keefe described the Assessment of False Attraction at the Tailrace Fish Barrier study. This study will be a desktop study that will evaluate the potential of the Project tailrace design to attract fish in the Project vicinity into the tailrace. Tailrace design will be refined based on the study results.

Mr. Bryan Nass described the development of a Life Cycle Model (LCM) for Chinook and sockeye salmon. The LCM is a mathematical model based on study results, data from the Bristol Bay region, and scientific literature. The LCM allows quantification of the likelihood and

magnitude of impact to a fish population by the Project or climate change. The LCM allows for answering questions about impacts to fisheries resources based on specific scenarios.

Mr. Bryan Nass spoke about the Integrated Risk Analysis (IRA). The IRA will allow classification of information obtained about fisheries resources to make decisions regarding allowable levels of risk and impacts to fish populations.

Mr. Charles Sauvageau gave a brief overview of the Future Flows study that was developed in collaboration with NMFS. The study will use the best peer-reviewed climate models to predict future flow conditions.

Water Resources:

Mr. Charles Sauvageau described the Water Quality Study, which will evaluate dissolved oxygen and water temperatures in the Project vicinity and potential impacts to these water quality parameters as a result of the Project.

The Flow Duration Curve Assessment, as described by Mr. Charles Sauvageau, will be a desktop study that examines the stationarity of the flow duration curve for the Nuyakuk River using analytical methods. If the dataset exhibits non-stationarity, the seasonal flow pattern changes during the last 20 years will be evaluated. The study methods include the use of a standard U.S. Army Corps of Engineers change analysis tool.

Mr. Charles Sauvageau also described the Ice Processes Assessment that is proposed for the Project, which will be a desktop study that helps to provide an understanding of ice formation processes and the potential for localized modifications based on Project operations.

Mr. Sean Eagan asked if the Cooperative plans to start the ice study this winter, or if nothing starts until the abeyance is removed. Mr. Cory Warnock and Mr. Charles Sauvageau responded that if the abeyance continues, some specific study-related items may be selected to be started this winter.

Ms. Molly Welker asked if winter flows above and below Nuyakuk Falls would be studied on site. Mr. Charles Sauvageau responded that the Cooperative plans to install a site-specific stream gage to measure accretion between the upstream USGS gage and the study site. The gage will be installed above the Falls, but it may not be possible to install a gage below the Falls due to safety and equipment limitations. However, Mr. Sauvageau stated that he did not expect the stream flow below the Falls would be substantially different from above the Falls.

Mr. Mischa Ellanna asked if pH would be evaluated, since acidification can occur in freshwater systems in addition to marine systems. Mr. Charles Sauvageau and Mr. Cory Warnock responded that at the present time, pH hasn’t been identified for study, but may be studied if there is justification for measuring this parameter. Mr. Warnock recommended that Mr. Ellanna submit this comment in the official record.

Terrestrial Resources:

Mr. Cory Warnock described the terrestrial resources studies proposed for the Project, including Wetland/Botanical Surveys and Caribou Population Assessment. These studies will cover the entire Project area, including potential transmission line corridors.

Cultural Resources:

Mr. Cory Warnock presented overviews of the Section 106 Evaluation and Subsistence Studies that have been proposed for the Project, which are designed to conduct thorough evaluations of historic and cultural resources, and subsistence use of the Project vicinity.

Recreation Resources:

Mr. Cory Warnock presented overviews of the Noise Study and the Recreation Inventory by Season that have been proposed for the Project. These studies will assess any impacts due to noise during construction or operation of the Project, and any impacts to Project-vicinity recreation.

Next Steps Discussion

Mr. Cory Warnock presented several items that are planned for work in 2021, including filing a revised PSP for formal review and comment, which would thus re-start the FERC Integrated Licensing Process (ILP). Prior to that time, the PSP will be distributed for an informal review period in order to provide stakeholders with an additional review period. Following the PSP filing with FERC, a review and comment period will occur and the Cooperative will respond to comments. The Cooperative will prepare a Revised Study Plan (RSP), and FERC will then issue a Study Plan Determination (SPD).

In 2021, the Cooperative plans to install the site-specific stream gage, complete the construction of temporary housing, conduct geotechnical analysis, and initiate the study permitting process for 2022 and 2023.

Ms. Kay Andrews asked what studies would be conducted relative to the transmission line. Mr. Cory Warnock responded that multiple studies, including the caribou study and wetland/botanical studies will assess the potential impacts to those resources as a result of the transmission line and refine transmission line placement.

Ms. Sue Flensburg asked if commercial operators would be contacted during recreation studies. Mr. Cory Warnock confirmed that they would definitely be contacted.

Ms. Kay Andrews asked what kind of studies will be conducted on transportation corridors. Mr. Cory Warnock responded that the primary transportation corridor will be the airstrip, and that natural resource studies and conceptual design refinements would include the airstrip.

Mr. Cory Warnock discussed key milestones and next steps that are planned for 2022-2023, which includes comprehensive study seasons in 2022 and 2023. Following each study season, study reporting and study reporting meetings will occur. Between 2022 and 2024, further

geotechnical analysis will be conducted, Project design will be refined, and licensing documents will be prepared.

Mr. Robert Himschoot and Mr. Will Chaney both spoke regarding the Cooperative's intent to collaborate with the community through the process, and they expressed the need for the community to find an environmentally responsible, non-diesel based method to generate electricity. Mr. Himschoot summarized the Fish First Resolution that the Cooperative operates under which states that they will not prioritize development of any projects if they are deemed detrimental to the region's aquatic and fisheries resources.

Ms. Laura Johnson (McMillen Jacobs Associates) stated that the Project contact list would be provided with the PSP on Friday, September 24 and a 3-week informal comment period would follow the distribution. The Cooperative would like to receive comments back no later than October 15, 2021.

Mr. Cory Warnock asked if anyone had final questions. Ms. Sue Flensburg requested that stakeholders be provided with an abbreviation and acronym list. Mr. Warnock responded that the PSP will contain a list of abbreviations and that the Cooperative can provide the FERC timeline as well, which will contain explanation of FERC-specific terms.

Ms. Robin Dublin (ADFG) asked if Thursday's meeting will be the same as Tuesday's meeting. Mr. Warnock confirmed that the presentation will be the same, but the content may differ slightly in terms of what questions are asked and any follow-up discussion that occurs.

The meeting adjourned at approximately 3:30pm Alaska time.