



SUSITNA-WATANA HYDRO

Meeting Notes Technical Workgroup meeting 06/26/2013

LOCATION: Alaska Energy Authority – Board Room
813 West Northern Lights Blvd.
Anchorage, AK 99503

TIME: 8:30 a.m. – 3:00 p.m. – (AKST)

SUBJECT: 2013 Quarter 2 Update

Goal: Update on Q2 activities and Q3 schedules

ATTENDEES: Eric Rothwell NMFS, Betsy McGregor AEA, Dan Healy NHC, Lori Verbrugge USFWS, Joe Klein ADF&G, Kirby Gilbert MWH, Stormy Haught ADF&G, Laura Noland Environ, Bob Henszey USFWS, Paul Dworian URS, Catherine Berg USFWS, Kim Sager DNR, David Schade DNR, Bob Butera HDR, Bryan Carey AEA, Henry Brooks DNR, Marie Steel DNR, Chris Holmquist-Johnson USGS, Colin Kikuchi USGS, MaryLouise Keefe R2, Dudley Reiser R2, Bill Fullerton Tetra Tech, Kathryn Peltier McMillen, Matt Love VNF, Wayne Dyok AEA

ON PHONE: Steve Padula McMillen, Leanne Hansen USGS, Rob Plotnikoff Tetra Tech, Harry Gibbons Tetra Tech, John Haapala MWH, Hal Shepard CWA, Jan Konigsberg AK Hydro, Charlie Wisdom Environ, Gabriel Wolken DGGs, Renee Wamsley Tetra Tech, Mike Buntjer USFWS, Mike Harvey Tetra Tech, Kathy Dube Watershed Geodynamics, Bob Mussetter Tetra Tech, Lyle Zevenbergen Tetra Tech

This was the second 2013 quarterly geomorphology, ice processes, and water quality resources Technical Working Group (TWG) meeting. The quarterly TWG meetings are intended to provide status on study plan progress, communication and discussion regarding any study plan variances that may be required given actual field conditions, and planned next steps.

The following meeting notes are to capture any significant discussion/information in addition to the materials provided on the Project website (<http://www.susitna-watanahydro.org/>). The meeting agenda and materials are available under the “previous meetings” tab (link provided under the meetings tab) on the Project website.

Following introductions a brief overview regarding overall project status was provided by Kirby Gilbert. No approved access to CIRI and associated village corporations’ lands, a delayed ice breakup, and challenging logistics involved with a remote large field presence have caused some variances from approved study plans which are explained in the presentations and summarized in the following notes. A map of the Project area in relation to CIRI and associated village corporations’ lands will be provided by AEA to licensing participants.

Glacier and Runoff Changes Presentation – Gabriel Wolken

Gabriel Wolken provided an update on the recent data collection efforts and planned activity for Q2 2013. UAF is assisting AEA with the modeling efforts to produce enhanced runoff estimates for the proposed Susitna-Watana-Dam compared to statistical flow analysis.

- Spring 2013 seems to be a month behind typical conditions, causing low temperature, blizzards and helicopter logistics complications. This is illustrated in Slide 5 which shows the Susitna Glacier in late April. This area is typically without snow at this time of year.
- An on-ice station's solar panel was covered by a late blizzard. The station captured the blizzard, confirming that the instrument functions properly, and 17 days of data was missed due to loss of power. The crew uncovered the solar panel as soon as possible.
- Snow accumulation is spatially variable in higher elevated regions, making it difficult to estimate and calibrate precipitation. Manual measurements are being taken to calibrate the model.
- Snow density does not vary much in high elevation areas; generally between 360 and 420.
- Current data will be used in the model with historic data used as calibration. The calibration stage (as depicted in slide 9) is almost complete.
- Slide 10 illustrates the sample locations. These sites are in the same relative locations as in the 80s, to the extent possible, allowing a better comparison of mass balance measurements.
- Slide 11 shows that calibration runoff measurements are very close to actuals at the Susitna River near Cantwell. The following two slides do not match as well, but much improvement has been made since these slides were created.
- Slide 15 calls attention to some calibration concerns. These measurements have improved since this slide was created.
- Slide 16 shows the soil temperature profiles before and after calibration.
- Without factoring permafrost in the soil temperature profiles, the winter runoff will always be underestimated.
- The cold and wet fall of 2012 contributed to the loss of all but one of the ablation stakes which measure mass balance. The 2013 efforts proved successful.
- Eric Rothwell asked if a change in the thaw depth, changing the flow path, will be able to be predicted in the model. Gabriel Wolken explained that one would need detailed geologic subsurface data to know the flow path changes. The model reflects only the data supplied to it. Bryan Carey added that the basin is generally shallow bedrock which is mostly impermeable. Runoff amounts may not be greatly affected by a change in thaw depth.

Water Quality Studies – Paul Dworjan

Paul Dworjan presented a status update for the Water Quality Resources. Harry Gibbons and Rob Plotnikoff assisted in discussing modeling and mercury details.

- Thermistors have not been installed in Portage Creek due to high flows limiting helicopter landing and no access to a boat in the area.
- Although many thermistors survived the winter, all located between Talkeetna and Portage Creek were lost due to ice. These thermistors will be reinstalled.
- Slide 5 illustrates the anchoring system for the thermistors. Due to no land access, thermistors are unable to be installed at Portage Creek or the dam site. 2012 data have been retrieved from these sites and combined with historic data. Data show that temperature is consistent through this area with data further downstream. This makes it less crucial to collect temperature data within that portion of the study area.
- All sites for sediment sampling above the dam site will be located within the proposed reservoir area.

- Slides 10-16 illustrate the sampling approach for the water quality resources. One well will consist of a stainless steel sheath to accurately collect water quality chemistry data. Shallow wells (not domestic wells) provide a location to take some water quality parameters.
- Water temperature modeling will occur in the main channel of the Susitna River. Point data will be taken to calibrate the model.

Mercury, Slides 17-18

- Permitting issues have delayed the sampling of eagle feathers for mercury content.
- Lori Verbrugge referenced the most recent wildlife TWG meeting. She recalled AEA needing 10 grams of fur for analysis for mercury. Because the previous efforts were not successful in collecting river otter samples from trappers (because no otters were trapped from the area), Brian Lawhead had suggested hiring a trapper dedicated to collecting samples for the Project. Lori disagreed with this approach and prefers the use of fur snags. Paul Dworin said that the otter population was so small, locating them would be difficult. He agrees with the use of fur snags as a preferred method, but warns that the chance of success is low.
- FERC requested the use of the 1631E method in its SPD to analyze the mercury samples for fur/feathers. Lori Verbrugge felt that the 7473 method, which requires a smaller sample size, should provide an adequate level of detectability to support the analysis.
- A consultation will be scheduled to discuss sampling techniques and analysis methods.

Ice Processes Presentation – Bob Butera

Robin Beebee is no longer the Ice Study Lead due to a change in employment. Bob Butera has assumed the role. Bob was involved in the Susitna Watana feasibility report in 2009 and had assisted Robin Beebee during the fall of 2012 for the freeze up study. He was not present for the breakup surveys or analysis and is continuing to familiarize himself with the details of recent data collection and modeling plans.

- The overall goal of this study is to document freeze-up and breakup characteristics and model post-Project conditions.
- This summer AEA plans to develop the existing conditions modeling calibration.
- Slides 3-19 provide an overview and photographs of the 2012 freeze-up conditions.
- Slides 20-26 provide an overview and photographs of the winter conditions from freeze-up 2012 to breakup 2013. Two main types of open leads were observed; thermal and velocity. Photographs are provided comparing the two.
- Slides 27-38 provide an overview and photographs of the 2013 breakup conditions.
- Preliminary data will be available to AEA by July 30, 2013. The RSP says that the data would be available on June 30, 2013, but the month delay in breakup has caused a month delay in the deliverable.
- Ice modeling will be conducted with the assistance of the University of Alberta. They are improving an existing model to fit the needs of this study.
- A technical team meeting will be scheduled to discuss modeling details with modeling experts present. Materials requested by licensing participants include the following.
 - A timeline of 1-D and 2-D modeling efforts for licensing participants to review.
 - A list of studies dependent on the ice model and to what degree they require output from the ice model. If these interdependencies can be confirmed soon, this will ensure that expectations are consistent with the resolution provided by the model.
 - Lessons learned from 2012-2013 efforts.

- Data from 2012-2013 efforts.
- Wayne Dyok noted that the 2012 flows at the time of the ice moving upstream of the Yentna correlated with the post-Project flows predicted at Sunshine Station.

Geomorphology Presentation – Bill Fullerton

Bill Fullerton presented a status update for the geomorphology resources. Topics included FERC-related activity as well as specifics on the modeling approach, large woody debris, field efforts, sediment data collection and aerial imaging.

- The 1-D modeling will be applied throughout the Middle River and the Lower River downstream to approximately PRM 30. It will provide predictions of the overview of the major changes over long stretches of time. The current plan is to model current conditions and predict Project effects on geomorphology in 25 years and 50 years. These changes will be applied as the start conditions for the 2D modeling in the same time periods. The 2D modeling will provide a more detailed understanding of Project effects in shorter time periods and for concentrated areas.
- Slides 6-10 explain the model selection process and which were chosen. The 1D model HEC-6T version 5.13.22-08 (MBH) has been chosen, but the 2D model remains undecided. AEA has chosen two 2D models; SRH-2D version 3 (USBR) and River2D (R2DM) (U. Alberta & U. British Columbia). In the fall of 2013 the 2D candidate models will be applied to Focus Area – 128 (Slough 8A). This Focus Area was chosen because of its complexity. The models will then be evaluated and a final 2D model will be chosen and applied to all ten Focus Areas.
- Wayne Dyok explained that the models predict Project effects with a determined operation. The opportunity remains during actual operation to make real time adjustments. This flexibility is not addressed during the modeling in the USR.
- The geomorphology cross sections, such as those in slide 11, are approximately one mile apart from another. This is adequate density for the size of the river. LiDAR will provide more precise data for areas exposed at low flows within the floodplain. LiDAR is scheduled to be collected in the fall of 2013 with a resolution of 8-9 points per m².
- Slide 12 provides an example of fine vs. coarse mesh sizes being applied to the Focus Area at Whiskers Slough. Generally the fine mesh will be 2 m between nodes and the large mesh will be 10 m between nodes. There will be intermediate mesh sizes to accurately model the hydraulics.
- If LiDAR, bathymetry and land surveys do not collect sufficient data in 2013, 2014 field efforts will be scheduled to collect any remaining data that are needed.
- Slides 17-18 illustrate current cross sections and compare the locations to those in the 1980s.

Large Woody Debris - Kathy Dube, Slides 19-23

- Large woody debris is being documented from PRM 3.3-261.3.
- A log jam is considered three or more pieces touching.
- Because of peak flows occurring since the 2012 photos were taken, 2013 photos are planned to be taken and the two sets will be compared to document movement of LWD.
- Slides 20-22 provide photos with the LWD identified with a pink line. Stars on slide 22 represent root wads.

Site Reconnaissance – Bill Fullerton, Slides 24-33

- The winter underwater cameras are not precise enough to conduct grain size analysis.

- Colin Kikuchi asked if the geomorphology team is working with RIFS to use their isotope analysis to find deposition rates. Mike Harvey said that the time meter for RIFS is suitable for dendrochronology and looking at a finer scale than is necessary for the geomorphology study.

USGS Sediment Transport Data Collection – Bill Fullerton, Slides 34-36

- The question was asked whether the suspended load data could be used to determine the bed material size. USGS cannot do this for the coarse bed material dominated rivers being studied since the suspended load is not a function of the bed material size since the measured suspended load is sand, silts and clays and the bed material is primarily gravel and cobble.

Aerial Photos and LiDAR, Bill Fullerton and Renee Walmsley, Slides 37-52

- Verification check points will be used to verify the accuracy of the LiDAR data.
- LiDAR will be flown as close to the first snow as possible. This will ensure that there is the least amount of leaves and maximum exposure for the LiDAR to hit ground.
- Canopy height may be available from the LiDAR data if the Riparian studies are interested.
- If the LiDAR in 2013 is unable to be completed, then the need for additional data collection will be evaluated.
- Aerial photography may be difficult to evaluate because of shadows, the need for sunny clear weather, and the time it takes to complete data collection may cause different flows to be captured.
- Chris Holmquist-Johnson suggested that AEA contact the Alaska OAS office to discuss the possibility of deploying an unmanned aircraft. He explained that they are lightweight, equipped with a video camera and GPS unit, relatively inexpensive and can be deployed to fly automated while field crew samples. Leanne Hansen mentioned that Greg Walker at UAF is a good contact for this technology.

Future plans

- Slides 53-55 summarize the Q3 2013 Study Efforts Rescheduled to Q3 2014.
- A technical team meeting may be necessary to discuss the modeling needs and details.

Additional Discussion

- Wayne Dyok confirmed that climate change will not be considered when designing the proposed reservoir. The reservoir design is based on the height of the dam, energy needs, economics and sediment input. Currently, the maximum elevation is designed at approximately 2,100 feet. Bryan Carey said that the changes in precipitation or snow melt will influence operations rather than design.
- During the lunch hour a small meeting was held regarding the tributary mouth, clear water plumes and backwater conversation which occurred during Monday's 6/24 TWG. It was concluded that the sampling area at tributary mouths will be extended 200 meters downstream. This occurs in two locations. Documentation of this meeting is also in the notes for the 6/24/13 TWG meeting.

Action Item**Date****Responsibility**

Action Item	Date	Responsibility
Schedule a technical team meeting to discuss mercury sampling and analysis.	July 2013	AEA
Schedule a modeling technical team meeting in the fall of 2013 to discuss modeling needs, expectations and details. AEA will provide as materials: 1. A spreadsheet listing each model, the input, the output, parameters, units, calibration/validation data.	Fall 2013	AEA