



SUSITNA-WATANA HYDRO

Meeting Notes Geomorphology, Ice Processes, and Water Quality Technical Workgroup Meeting 12/02/2013

- LOCATION:** Alaska Energy Authority – Board Room
813 West Northern Lights Blvd.
Anchorage, AK 99503
- SUBJECT:** 2013 Q3 and Q4 Study Efforts and upcoming 2014 Q1 Efforts
- Goal:** To provide an update of the 2013 studies including work performed in the last several months, potential variances from study plan, and identify upcoming Q1 2014 activities.
- Attendees:** Marie Steele DNR, Eric Rothwell NMFS, Steve Padula McMillen, Dudley Reiser R2, Michael Lilly GW Scientific, Marty Bozeman AEA, Doug Ott AEA, MaryLouise Keefe R2, Bill Fullerton Tetra Tech, Justin Crowther AEA, Matthew LaCroix EPA, Paul Dworjan URS, Jon Zufelt HDR, Bryan Carey AEA, Kathryn Peltier McMillen, Rob Plotnikoff Tetra Tech, Harry Gibbons Tetra Tech, Sarah O'Neal Trout Unlimited, Collin Macheel DNR, Gabe Wolken DGGs
- On Phone:** Dara Glass CIRI, Richard Leal CSDA, Bob Henszey USFWS, Greg Aubel USGS, Chris Holmquist-Johnson USGS, Leanne Hansen USGS, Steve Ertman HDR, John Hamrick Tetra Tech, Iris Vandenharm Denali Nordic Ski Club, Matt Cutlip FERC, Jan Konigsberg AK Hydro, Becky Long CSDA, Hal Shepherd CWA, Monica Chowderly FERC, Mike Wood Talkeetna Resident, Becky Aukonik CSDA, Wayne Dyok AEA, Kirby Gilbert MWH, Chuck Sensiba VNF, Matt Love VNF, Betsy McGregor AEA, Colin Kikuchi USGS, Charlie Wisdom Environ, Dominique Glass Environ, Mike Sondergard BLM, John Haapala MWH, Mike Bruen MWH, Terry Schwarz DNR, John Hamrick Tetra Tech, Felix Kristanovich Environ, Susan Walker USFWS, Greg Reub Environ, Jim Vohden, Kevin Fetherston R2, Paul Makowski FERC, Joe Klein ADF&G, Phil Brna USFWS, Mike Harvey Tetra Tech, Kim Nguyen FERC, Stormy Haught ADF&G, Kathy Dube Watershed Geo, Lyle Zevenbergen Tetra Tech, Woohee Choi FERC

This was the fourth 2013 quarterly geomorphology, ice processes, and water quality resources Technical Work 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.

After introductions, Steve Padula presented a brief overview of upcoming FERC-related study milestones. These details are in the Study Plan Implementation Presentation. Action items for the three day Q4 aquatics TWGs will be at the end of the 12/4/2013 meeting notes.

ALL DATA PRESENTED ARE PRELIMINARY AND SUBJECT TO CHANGE DURING THE QA/QC PROCESS.

RSP 7.6 Ice Processes Presentation –Jon Zufelt

Jon Zufelt provided an update on the activities regarding the Ice Processes Study.

- A draft white paper documenting a review of existing hydropower projects and their effects will be available prior to the ISR filing in February 2014.
- Representative years for modeling climatic conditions are still under discussion and may include warm, cold and average years; wet, dry and average years; or fast freeze-up and slow freeze –up years. The TWG will be included in future discussions regarding this topic. These conditions will be determined from historic records, including ice data from 1980-85 and 2012-present, and information from the Ice Jam Database maintained by the Army Corps of Engineers' Cold Regions Lab. Mike Wood suggested contacting the Alaska Railroad for additional data.
- Eric Rothwell said that the stakeholders are not all in agreement with the placement of the arrows on slide 15 showing model interdependencies and that he remains concerned about the level of uncertainty related to ice effects on fish habitat.
- The model is able to incorporate different temperature inflows from lateral habitats and tributaries, but the influence is considered minimal in the 1D model due to the relative volume of inflows to the mainstem flow. The 2D model incorporates these temperature differences for areas where temperature differences are more important to ice cover thickness.
- The 1D ice model will not include a single air temperature dataset throughout the river. It will interpolate air temperature data from the closest ESS or met data station.
- Future bridging locations will likely be determined in the model by looking at the associated parameters at current ice bridging locations and locating similar conditions. Eric asked how the model would address new bridging areas that might develop under future conditions. Jon responded that a bridging "parameter" could be developed to apply to other locations.
- "Freeze up" was defined as the time from when the average daily air temperature reaches 32 degrees F until the solid ice cover reaches Talkeetna.
- Convergence parameters and the associated tolerance levels will be provided with model results.
- Colin Kikuchi suggested that observations could be weighted by their likelihood of accuracy. He requested that a plot of residuals be provided in the ISR.
- Dara Glass noted that EPA has issued a recent climate change report that should be reviewed.
- The two years of intense observations (2012-13 and 2013-14) will be used; one year for calibration and one year for validation.

RSP 5.5 Water Quality Presentation

A brief update for the three water quality studies is provided in the Water Quality presentation. Variances and planned activities for all studies are on slides 44-48.

Baseline Water Quality, Slides 3-30 – Rob Plotnikoff

- Slide 10 shows the results of total phosphorus and metals sampling and the need to conduct follow up analysis including lab split samples to address data anomalies. The issue related to use of preservatives in some samples was discovered mid-September and repeat samples will be properly analyzed prior to the ISR.
- Eric Rothwell expressed concern with having sufficient water quality data to address spatial resolution under ice conditions to assess potential effects on overwintering fish habitat through modeling. Dudley responded that some of the data from the IFS (instream flow study) monitoring program will be of help in this.
- In response to a question from Felix, Harry indicated that data analysis is ongoing and that data will be finalized over the next two months.

Mercury, Slides 31 -33– Paul Dworjan

- The ages of fish in slide 32 will be updated once analysis of the otoliths is completed. These data will be available in the ISR.
- Soil samples analyzed for mercury were collected between the mineral soil layer and the vegetative layer (in the peat). Peat is known to accumulate mercury. These data will be available in the ISR.
- Rob Plotnikoff explained that the USR will provide more data and analysis than that being presented today. The ISR will contain few results and conclusions since the study will not be complete until after the 2014 field efforts and subsequent analysis. Where appropriate and QA/QC complete, the ISR will provide a link to supporting data sets and examples referenced within the text.

Reservoir and River Modeling, Slides 34-43 – John Hamrick

- Resolution may be reexamined if strong variability is found between the mainstem and lateral habitats.
- Focus Area lateral habitats will have a more refined grid with a transition to the more coarse grid in the mainstem.

Physical Sciences Presentation**4.5 Geology and Soils, Slides 2-4**

Mike Bruen presented Geology and Soils study updates and variances. He explained that the study has revealed 2 mineral claims in the reservoir area (in the Jay Creek area). Any other claims within the Project area are related to proposed transportation corridors.

16.6 Seismic Study, Slides 5-7

Mike Bruen presented updates and variances on the Site-Specific Seismic Hazard Study. The study area is within a 100 km radius of the proposed dam site. The quaternary geology and seismotectonic model details are more refined as they get closer to the dam site.

16.5 Probable Maximum Flood Study, Slide 8

Jon Haapala presented an update on activities related to the Probable Maximum Flood Study.

7.7 Glacier and Runoff Changes – Gabe Wolken

Gabe Wolken presented the TWG with an update on activities related to each task of the Glacier and Runoff Changes since the beginning of the 2013 summer. Variances are included on slide 31.

- The literature review component of this study will be included in the ISR.
- The blue highlighted stations on slide 11 are used to downscale the model. Talkeetna is relatively wet and Gulkana is relatively dry.
- Slide 24 shows model results which are not accurate in high elevations. This is a result of the model not producing enough snow and/or not melting enough snow/ice. The model is lacking high elevation in situ data, so the study is collecting more data for validation purposes.
- The model is projecting to year 2100.
- Outburst flooding has not been observed much, but in the lower part of the glaciers, debris “lakes” have been “bursting” which can have the same kind of effects.

RSP 6.5/6.6 Geomorphology Presentation – Bill Fullerton

This presentation provides an update for all tasks associated with the geomorphology studies. An overview is provided on slides 2-3 and variances are on slides 50-51.

- Geomorphic features delineated on the current and historical aerial photography are defined by the bank features with the interior being the channel and the exterior encompassing the entire floodplain (vegetated area).
- After the flood event in August '13, sand deposition was observed in many of the lateral habitats (as seen in slide 15).
- In Slide 22 a preliminary conclusion concerning the feature on the far right, the Holocene terraces, is they were created in the mid-1700s when the river may have been undergoing a period of degradation associated with the Little Ice Age. When comparing 1980s data to current conditions, it does not seem that the river bed is degrading.
- LiDAR results are in the process of being indexed. Depending on the results, additional LiDAR may be needed for the areas where data were not collected during 2013.
- Floodplain areas seem to be inundated more often than the open water stages and associated return periods suggest. This emphasizes the potential role of break up ice jamming on backwater effects, including increasing the frequency of inundation.
- **Large Woody Debris, Slides 30-33, Kathy Dube**
 - 2014 field efforts will be applied to the Upper River and the remaining Lower River sites.
 - Field observations during the August high flows events and discussions with local boat operators suggest that small trees begin moving at approximately 35k cfs, and large trees begin moving at approximately 40k cfs (flows measured at Gold Creek gage).
- The simulation of specific events will help with understanding the mobilization of sediment under pre-Project and post-Project conditions.

- The potential for high flows and stages during break up is anticipated to be reduced with the Project, which could result in less floodplain inundation and mobilization of bed load during breakup under post-Project scenarios.
- Field efforts in 2014 will be occurring above the dam site to help characterize the sediments that are currently being supplied to the dam and subject to trapping by the dam in with Project scenarios.

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