



SUSITNA-WATANA HYDRO

Meeting Notes Instream Flow, Riparian Instream Flow and Groundwater Resources Technical Workgroup Meeting 06/25/2013

LOCATION: Loussac Library – Public Conference Room
3600 Denali Street
Anchorage AK

TIME: 8:30 a.m. – 4:30 p.m. (AKDT)

SUBJECT: 2013 Q2 Update

Goal To provide an update on IFS Program (Fish and Aquatics, Riparian, and Groundwater) activities during Q2 2013 and activities planned for Q3 2013.

ATTENDEES: Kathryn Peltier McMillen, Kirby Gilbert MWH, Scott Crowther Ratepayers, Jeff Davis ARRI, Joe Klein ADF&G, Mike Buntjer USFWS, Sue Walker NMFS, Greg Auble USGS, Colin Kikuchi USGS, Chris Holmquist-Johnson USGS, Catherine Berg USFWS, Dara Glass CIRI, Jan Konigsberg AK Hydro, Eric Rothwell NMFS, Betsy McGregor AEA, Bob Henszey USFWS, Wayne Dyok AEA, Matt Love VNF, Marie Steele DNR, Kate Dueber DNR, MaryLouise Keefe R2, Dudley Reiser R2, Bob Buterra HDR, Mathew LaCroix EPA, Bill Fullerton R2

ON PHONE: Steve Padula McMillen, Becky Long CSDA, Whitney Wolf Talkeetna Community Council, Stormy Haight ADF&G, Henry Berg DNR, Dominique Glass Environ, Jennifer Curtis EPA, Mike Gagner R2, Phil Hilgert R2, Kim Sager DNR, Casey Klipperton Golder, Jason Robinson FERC, Bill Miller Miller Ecological, Michael Lilly GWScientific, Dana Schmidt Golder, Hal Shepard CWA, Kevin Fetherston R2

This was the second 2013 quarterly instream flow, riparian instream flow and groundwater 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 intended 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 showing CIRI and associated village corporation lands will be provided by AEA to licensing participants.

8.5 Fish and Aquatics Instream Flow Presentation – Dudley Reiser

Dudley Reiser provided an overview of the progress regarding the Instream Flow Study including any variances from the approved study plan, supplemental filings, and plans for the third quarter of 2013. Technical Team meetings have occurred since the previous TWG meetings to discuss specific topics of the Instream Flow Study. Notes from these meetings are available on the Project website under the respective meeting date. All comments provided by participants are being considered throughout the implementation of the study. Formal responses will not be provided by AEA, but the comments may be reflected in the ISR.

- The tributary gages, locations provided in slide 9, will be removed before freeze up and reinstalled as soon after breakup as possible. Some pressure transducers will remain in place throughout the winter. Models may be calibrated with data from surrogate year-round gages or spot measurements for spring runoff.
- Joe Klein asked that tributaries with known groundwater influence be prioritized when placing gages to capture the unique relationship.
- Bathymetry – ADCP data assists in identifying lateral margins for flow measurements. LiDAR collected at low flow will be used to identify the bathymetry of seasonally inundated shallow pools and shoreline. Both methods are used to identify stranding and trapping locations.

Focus Area Selection – Slides 20-27

- As illustrated in the slides, some Focus Areas have shifted as a result of FERC's SPD. Bob Henszey stated that AEA's original concept of a Focus Area was an area in which all related disciplines are studied, however now it appears that for some studies, such as RIFS, surveying will not occur in all Focus Areas. He asked if there is an updated definition of a Focus Area. Dudley Reiser explained that Focus Areas are areas with data collection by multiple disciplines, not necessarily all, at a level of focus necessary for their specific study/objective; fish distribution and abundance, habitat characterization, geomorphology, water quality, and instream flow data is intended to be collected at all of the sites. A more detailed definition of Focus Area is provided in the RSP. (RSP 8.5, pp -8-29 to 8-30).
- The lack of CIRI and associated village corporations' land access prevents activity above the ordinary high water mark in Focus Areas 184 (dam site), 173 (Stephan Lake), and 151 (Portage Creek).
- Slide 27 provides a preliminary example of how the fine vs. coarse mesh will be applied within a Focus Area. The fine mesh is approximately two meters between nodes and coarse mesh is around 10 m between nodes. This is variable and dependent on the underlying habitat. If desired data density requires a smaller mesh size, modifications can be made.
- LiDAR at low flows will provide ample data for the shallow, fine mesh topography. Transects will provide data for the deeper areas. Chris Holmquist-Johnson asked about the density of the data collection versus the mesh size, noting that if the transect spacing is greater than the distance between nodes, the transect data would need to be extrapolated. It was explained that it would be Digital Terrain Model (DTM)-based and that the density of the data collected would be based on the width of the channel, substrate size, breaklines, and top of bank breaks.
- Chris requested that the data density be provided to support the applied mesh size. Chris also requested that after the surveys are conducted, maps be provided which show transect locations and data types with the mesh sizes.
- LiDAR is scheduled to be collected this fall at low flows.

HSC Curve Development – Slides 28-35

- HSC curves were prepared using data from the 1980s and literature review. The results are provided in the IFS compendium (on the Project website – documents tab – 2012 environmental studies - A Compendium of Technical Memoranda). Eric Rothwell requested that data sources be provided so the reader can understand what assumptions are being made.
- Slide 31 illustrates the prioritization applied to species for the HSC study component. This includes all life stages of each species listed. This prioritization will drive site location, sampling time and method. All fish observations will be documented, even if not a targeted species.
- Bob Henszey initiated discussion of prioritizing the Bering cisco, because only three distinct populations exist. Joe Klein said that he understands they only travel into the Lower River and utilize other systems in the region. Stormy Haught confirmed that the population has a large range. Dana Schmidt said that during the 1980s studies they were known to spawn by the Parks Hwy Bridge during times of low flow. Dudley Reiser said the he will coordinate with the Fish Distribution and Abundance studies in the fall to reevaluate the Bering cisco priority status.
- Slide 34 illustrates the measurement device being used to detect areas of groundwater upwelling and down welling. This device is being installed 10-20 cm into the ground and has proven easy to install in cobble and gravel substrates. Colin Kikuchi requested that the instrument be installed at deeper depths (20-30 cm) to avoid false upwelling caused by shallow bedform induced flow paths. Colin also asked that point measurements of hydraulic conductivity be collected to confirm the accuracy of this device.
- Eric Rothwell asked that vertical temperature profiles be collected at HSC sites. Mike Gagner explained that temperature measurements will be collected at the site of each observed fish, but not at multiple depths.
- Clear water plumes are not currently included in the HSC Focus Areas so extra sites will be located to encompass this habitat.

Winter Study Efforts – Slides 36-44

- Field work was conducted in January/February, March, and April of 2013. Breakup conditions were hazardous so efforts were scaled back in May for the safety of the crew.
- Because of the ice influence, stranding and trapping may be a significant concern in winter conditions. Eric Rothwell asked that stranding and trapping areas be included in the next winter field efforts. Dudley Reiser added that bathymetry results, cameras and ice modeling may be useful tools to evaluate stranding and trapping in the winter. Emergence timing, estimated in the HSC and ELH efforts, will also be useful in understanding stranding/trapping risks.
- Slide 43 includes preliminary results of a thermistor chain deployed at Whiskers Slough. The temperature gradients are detectable.
- Slide 44 includes preliminary observation results during HSC winter efforts. Considering the amount of effort spent, observation numbers seem small. Age classes are determined by the size of the individual with <60 mm being considered fry and >60 mm juvenile. Both size classes were observed during the winter which is a time that fry would not be expected to be present. However, because of the cold temperatures in the Susitna River, it is possible that juvenile fish may be smaller than 60mm. AEA will reconsider this classification.

Riparian Instream Flow Presentation– Kevin Fetherston

Kevin Fetherston provided a progress update for the Riparian Instream Flow Study. This study is integrated with Groundwater and the Riparian Vegetation Studies. Progress update topics included:

- The Geomorphology Study is teaming with the Riparian IFS and Riparian Vegetation studies to excavate soil trenches (approximately 2m x 2m) for the sedimentation study. Slide 8 provides a map identifying the location of the first two trenches.
- The Riparian Vegetation Study in collaboration with Riparian IFS and Geomorphology Studies is preparing soil samples for sediment isotope analysis dating the rate of floodplain sedimentation from soil trench samples.
- As slide 9 indicates, each trench will be dug to the gravel, cobble refusal layer. Samples will be also be extracted for standard sieve grain size analysis.
- Slides 10-12 illustrate tree scars and the processes which causes them. The distance from the river that tree scars occur appears to be dependent on the density of the forest.
- Slide 13 illustrates the “cutting” effect that ice may have at the edge margin of the floodplain. The ice shapes the bank, exposing roots of neighboring trees.
- Ice has two major effects on island vegetation; shear force where ice directly contacts the island floodplain and vegetation and sediment deposition resulting from backwater flooding upstream and along ice dams.
- The topics on slide 16 were discussed during various technical team meetings. Licensing participants’ comments are being considered throughout the implementation of the study unless specific to a supplemental filing, which includes a comment-response table.
- Areas of riparian vegetation sample plots are consistent, but the shape depends on the ecotype polygon shape. For long linear ecotypes, a rectangular plot will be sampled; otherwise circle plots will be sampled.
- The late spring has delayed installation of the tree sap flow sensors.
- Symbols in slide 22-26 locate sites with single stations and cluster stations. Single stations have a well with a data logger for water level and temperature. Cluster stations have a well with a water level and temperature data logger as well as at least one additional data collecting instrument such as: sap flow sensors, additional well, and/or pressure transducers.
- Only the Focus Area at Slough 8A will have 3-D modeling for groundwater. This Focus Area was chosen as being preferable for 3-D analysis addressing groundwater study objectives. A meeting planned for the first quarter of 2014 will discuss the merits of 2-D vs. 3-D modeling and the potential need for expanding 2014 modeling efforts.
- Summer 2013 riparian field crews will sample a range of riparian soils and vegetation throughout both the Middle and Lower River Project areas. These data will be compiled in a database by the Q1 2014 TWG meeting.

Groundwater Presentation – Michael Lilly

Michael Lilly discussed the progress made in the Groundwater Study. The presentation provides an overview of the objectives and highlights from the Q2 2013 activity as well as forecasting for the Q3 2013 activity.

- Groundwater modeling is intended to answer the following questions
 - What is the range of groundwater depth, and its variance, throughout the modeled area?
 - How is groundwater depth associated with river stage?
 - How would the Project affect groundwater in riparian areas?
- Wayne Dyok confirmed that the geotechnical activity, as explained in the RSP, has been rescheduled for 2014. The question was in reference to studies in the vicinity of the proposed dam site. There are data from the 1980s as well as 2012. Any geotechnical data relative to the Groundwater Study will be explained or referenced in the Groundwater ISR.

- Domestic wells are being instrumented where possible to collect temperature and water level data. Spot measurements are taken to QA/QC the data. Colin Kikuchi suggested applying 3D modeling to Gold Creek where additional deep/domestic wells may exist to obtain a more thorough understanding of the area.
- The Groundwater Study coordinates significantly with other studies. For example, thermal open leads identified in the Ice Study indicate groundwater upwelling locations. Thermal imaging conducted in the Water Quality Study helps locate upwelling as well. Tributary gaging will be conducted as a component to the IFS study. The Riparian Instream Flow Study will be conducting isotope analysis to determine riparian vegetation water source.
- In slides 15-19 and 24-27 yellow ovals surround areas being studied to better understand how the surface water/groundwater influences habitat.
- Slide 18 illustrates the groundwater boundary conditions at Focus Area-Slough 8A (where 3-D modeling will be applied).
- Colin Kikuchi expressed concern that the lower boundary may not be accurately determined without wells deep enough to reach bedrock. In areas of shallow/exposed bedrock, Colin agrees with the modeling approach and that boundary conditions can be accurately determined. Because of this, Bob Henszey voiced concern that the data points may not be enough to determine plant response curves per ecotype, but may be enough per species.
- Bob Henszey asked that more wells be used to ensure all hydrologic gradients are captured. He was concerned that the wells used in the 2-D transect array may not capture other cross floodplain hydrologic boundaries. Michael Lilly clarified that pressure transducer data will be considered, rather than flow, when looking at the aquifer properties and that the pressure responses from river stage fluctuations would still help describe the processes related to groundwater and surface-water interactions. The most sensitive wells will be of greatest use.
- Eric Rothwell said that the predictive modeling will only be applicable in the areas being studied. Groundwater, riparian and aquatic habitat Integration occurs only in the select aquatic Focus Areas (yellow ovals). He was concerned that extrapolation would not be possible with this approach. Michael Lilly mentioned wells elsewhere and said that the need for more information will be evaluated once it is known to what extent the current plans will provide the required data.
- **Multi-Disciplinary Study Integration within Focus Areas – Slides 45-57**

Dudley Reiser provided a general overview of all studies' planned activity in the Focus Area- Slough 8A (also known as Skull Creek). Maps are provided with sampling locations identified.

Additional Discussion

- Agency staff and their contractors will be conducting a site visit this week (6/27-6/28). AEA will coordinate with them to ensure AEA's ongoing data collection efforts are not compromised.
- Becky Long requested a hard copy of the Final Study Plan (FSP).
- AEA will provide a link or direction to licensing participants regarding access to the ice/groundwater cameras.
- Jason Robinson confirmed with Kevin Hogan that FERC will not be responding to the supplemental filings.
- Final Study Plans will be posted on the Project website once complete. They will not be filed with FERC.
- Sue Walker said that the agencies will likely request an extension from FERC to review the ISR.

- Eric Rothwell requested that a modeling technical team meeting be scheduled in the fall of 2013 to discuss collected data and the need for more information and expanded modeling efforts. In this way a framework can be created to plan analysis with respect to time steps, parameters and integration.

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

Action Item	Date	Responsibility
After the surveys are conducted, maps be provided which show transect locations and data types with the mesh sizes	Feb 2014 (ISR)	AEA
Coordinate with the Fish Distribution and Abundance studies in the fall to reevaluate the Bering cisco priority status.	Sep 2013	AEA - IFS
Reconsider the use of length to classify fry versus juveniles in HSC.	Sep 2013	AEA
Provide Becky Long with a hard copy of the FSP.	Once available	AEA
Provide a link or direction to licensing participants regarding access to the website site for real-time reporting cameras		AEA
Schedule Modeling Technical Team meeting in the fall of 2013.	Fall 2013	AEA