

Meeting Summary
Susitna-Watana Hydroelectric Project Licensing
Water Resources Workgroup Meetings
June 13, 2012
AEA Project Offices, First Floor Conference Room
411 W 4th Avenue, Anchorage, AK
Stakeholder PAD Comments/Study Requests and Study Plan
Development for Water Resources (Instream Flow and Water Quality),
June 13, 2012, 9:00 am - 1:00 pm

Attendees:

Organization	Name
AEA	Betsy McGregor
AEA	Wayne Dyok
AEA	Brian Carey
ARRI	Jeff David (on phone)
USFWS	Mike Buntjer
USFWS	Betsy McCracken
USFWS	Bob Henszey
USFWS	Lori Verbrugge
USFWS	Lori Schtick (on phone)
NMFS	Susan Walker (on phone)
NMFS	Eric Rothwell
ADF&G	Joe Klein
ADF&G	Ron Benkert
ADF&G	Stormy Haight
ADF&G	Mike Beethie
ADEC	William Ashton
ADEC	Jim ???
ADNR	Melissa Hill
ADNR	Kim Sager
ADNR	Walton
BLM	Alan Peck
BLM	David Mushovic
BLM	Mike Sondergard (by phone)
EPA	Matt LaCroix
EPA	Lisa McLaughlin
USGS	Dave Meyer
FERC	David Turner (by phone)
FERC	Paul Makowski (by phone)
Natural Heritage Institute/Hydropower Reform Coalition	Jan Konigsburg
Long View Associates	Steve Padula
Long View Associates	Bao Le

Organization	Name
HDR	Michael Barclay (on phone)
URS	Paul Dworian
R2 Resource Consultants	Dudley Reiser
R2 Resource Consultants	Stuart Beck (on phone)
R2 Resource Consultants	Phil Hilgert
R2 Resource Consultants	Kevin Featherston
Tetra Tech	Harry Gibbons
Tetra Tech	Rob Plotnikoff
Tetra Tech	Christy Miller
Tetra Tech	Bob Mussetter
Tetra Tech	Mike Harvey
Tetra Tech	Bill Fullerton
E-Terra	Lars Gleitsmann
E-Terra	Steve Colligan
GW Scientific	Michael Lilly
Alaska Ratepayers	Scott Crowther
Coalition for Susitna Dam Alternatives	Becky Long (on phone)

Presentations

- Phil Hilgert (R2 Resource Consultants): Effective Spawning Incubation Model.
- Kevin Featherston (R2 Resource Consultants): Riparian Instream Flow Studies.

Introduction

Steve Padula (Long View Associates) acknowledged the receipt, by AEA, of stakeholder comments and study requests and noted that many of them were consistent with the study requests developed by AEA. Steve Padula stated that the goal of this week's set of meetings was to seek clarification regarding any stakeholder comments that would require the development of new studies, additional study tasks or differing approaches to existing study methods.

Brian Carey (AEA) reminded participants that the site visit has been moved the July 26-27th. He requested that those interested in participating RSVP by June 30th. He also asked that participants provide information about sites of interest and specific requirements from federal agency participants about paying for their own participation. Information can be provided to Brian via email at bcarey@aidea.org.

Baseline Water Quality Study

Paul Dworlan (URS) stated that in general, the study comments were consistent with what had been developed in the Baseline Water Quality Study Plan. There were, however, several water quality comments where he was seeking additional clarification as follows.

Paul stated that there were several comments related to concerns over water quality impacts during Project construction activities. Paul noted that these potential impacts are not currently known and that the intent of these studies is to establish baseline water quality information for the Project as opposed to assessing impacts to construction activities. Paul stated that as if/when construction occurs, permitting will be required but these are not activities at this point in time.

A number of comments were received regarding sampling and modeling mercury in the Susitna River. Paul believed that one potential challenge with mercury is that all of the related activities are spread out over many disciplines/studies. Paul added that there has been discussion about consolidating mercury into one interdisciplinary study where the primary objective would be to conduct basic sampling to determine the presence of mercury in the system. Lori Verbrugge (USFWS) asked if all media will be sampled. Paul noted that mercury would be sampled in a diverse set of media. Harry Gibbons (Tetra Tech) added that a pathways analysis would also be conducted. Rob Plotnikoff (Tetra Tech) expressed the need to collaboratively identify criteria for triggers that confirm pathways that support a step-wise approach.

A comment was received to conduct water quality sampling at a monthly frequency during the winter. Paul Dworlan stated that this is not the current intent given the challenging field conditions in the winter and because the water quality team does not believe that the magnitude of change in water quality are not rapid enough to justify such a high level of temporal resolution. Eric Rothwell (NMFS) asked whether anything would be missed with just two winter sampling events. Harry Gibbons stated that the system is biologically constrained and not dynamic during this time period which results in little change in chemistry. Eric requested that this rationale be stated clearly in the study plan.

Betsy McCracken (USFWS) asked how all of this information will be integrated to give stakeholders a clear understanding of the system. Harry Gibbons replied that the data is collected to calibrate the predictive capability of the modeling for future scenario projections. Alan Peck (BLM) asked how many years of water quality data will be collected to calibrate the model. Rob Plotnikoff replied that it is dependent upon the situation but in this case, it may be that one year of data can calibrate the model and a second year can function as the independent data set. Matt LaCroix (EPA) stated that without a middle of winter sampling period, it would be difficult to confirm static conditions. Matt noted that the Susitna River transitions to a groundwater influenced system in the winter and wonders if the first sampling period would capture this transition. He did not know if additional sampling would detect this but believed based upon the results of the first year of study, that revisiting winter sampling frequency could be warranted. Wayne Dyok (AEA) stated that such an approach of first year informing activities in the second year seems appropriate.

Water Quality Modeling Study

A comment was received questioning the choice of selecting the EFDC model over the CE-QUAL-W2 model. Paul Dworlan (URS) stated that the EFDC model was chosen due to its range. Rob Plotnikoff added that sediment transport and toxics could be addressed with EFDC in addition to the general suite of water quality parameters. Harry also believes the three-dimensional component of EFDC will be valuable for with regard to toxics modeling. Matt LaCroix clarified that (EPA) recommended the use of CE QUAL-W2 only because they were against the use of a one-dimensional model. Matt added that EPA would be happy with the EFDC model. Wayne Dyok stated that in the study plan, it would be helpful to add references about where this model has been used successfully.

A comment was received regarding the broad application of thermal imaging technology. Paul Dworlan sensed that comments were generally optimistic about this technology and that he was remained cautious about its utility. Paul clarified that the first year of thermal imaging is intended to be a pilot study. Paul noted that the window of time to utilize this technology successfully in the Susitna River (late August/early Sept) is small. Differentials to support detection only exist during a small window of time. Eric Rothwell (NMFS) recognizes the small window of time to sample using thermal imagery and requested that the study plan acknowledge the constraints so that stakeholders understand that failure represents a data gap which may require alternative approaches.

A comment was received regarding the addition of meteorological stations (2 or 3) in the Upper Susitna River basin. Paul Dworlan stated that he was not opposed to this. Rob Plotnikoff added that meteorological data is good for modeling but given that the terrain in this area is relatively uniform, it may not be necessary. In general, meteorological stations should be added in consideration of how much variability one would expect to see in this area. Rob Plotnikoff will provide in the study plan, a rationale for how many additional stations may be needed for the Upper Susitna River. Eric Rothwell stated that these comments were from NMFS and USFWS and that he would like to keep the discussion open to develop the best approach and get agreement from Bill Rice (USFWS) who also contributed to this comment. Bob Henszey (USFWS) has an interest in precipitation data. Kevin Featherston (R2 Resource Consultants) plans to have riparian meteorological stations where precipitation data will be collected.

A comment was received regarding the collection of additional water quality parameters at meteorological stations. Paul Dworlan did not have an issue with this request however, a caveat is that existing stations need to be evaluated for feasibility of upgrades given the potential for different technologies. Michael Lilly (GW Scientific) stated that there are various meteorological stations in existence but the level of collaboration will depend upon the potential for integration. Paul noted the value in co-location of meteorological stations due to the potential for acquisition of historical data.

A comment was received regarding additional metals sampling. Paul Dworlan stated that he was not opposed to this request but questioned why some metals were added and others were not with regard to the list. Lori Verbrugge (FWS) could not recall exactly why this is so. Paul asked whether it is acceptable to do a screen for all metals and then to reduce the metals sampled only

to those that have significant results. Lori believed that removing analytes that are not of concern after a robust first screen would be acceptable. William Ashton (ADEC) stated that he would like to see chromium, nickel, and selenium sampled during all events regardless of results. Paul noted that these are in the 2012 study plan. Paul will update the study plan to capture discussion.

Wayne Dyok (AEA) noted that comments were received regarding expanding the glacier melt study. Wayne stated that a long term approach to addressing this issue would be to engage the University of Alaska, Fairbanks, but for now Tetra Tech would develop a study plan to address this issue.

Instream Flow and Groundwater Aquatic Habitat Related Studies

Dudley Reiser (R2 Resource Consultants) began the discussion by presenting a figure that illustrated the instream flow study program, its component parts, and the linkages to other disciplines/studies. Dudley noted that similar to other study disciplines, the instream flow and groundwater comments were generally consistent with what is currently being proposed by R2 and AEA but as a result of reviewing stakeholder comments, some additional questions were identified as follows.

Instream Flow Comments

A comment was received requesting the study to quantify changes to the aquatic and riparian ecosystem due to operations over the expected life of the project, at least 100 years. Phil Hilgert (R2 Resource Consultants) stated that with regard to FERC-licensed projects, this impact analysis would typically be conducted over a maximum license term of 50 years. Betsy would ask that a copy of comment table available. R2 will provide. Eric Rothwell (NMFS) replied that 50 years of analysis is appropriate but wanted to make the point that the Project effects will much longer than a maximum license term. Eric added that this comment reflects NMFS' concerns with longer term impacts although he understands the need to conduct it within the FERC's appropriate timeframe.

A comment was received requesting the development of habitat flow relationships over a scale of 5 years. Phil Hilgert stated that currently, the study program is 2013-2014. However, once the models are developed and linked, an operational scenario can be developed over a 5 year increment. Eric Rothwell stated that problem is that the model is calibrated over a short time (2 years) and this may not be a representative time period; especially with regard to biological information. Eric stated that his concern was that 2 years of information may not encompass the variability for all resource areas. Phil Hilgert replied that the intent of the model is to extrapolate to conditions that may not be present over the next two years. With regard to operational scenarios, it is appropriate to begin with wet, dry and average water years as the basis for operations, but this would become refined as preferred scenarios are identified and would allow AEA to refine the period of record that is appropriate. Eric stated that his concern was having sufficient information for key life history stages that may overlap with operational changes and

that if assumptions were needed due to a lack of data that agencies would be forced to develop such assumptions conservatively. Dudley Reiser introduced periodicity as an example where variation can be considered conservatively within the modeling framework. Dudley stated that the modeling is intended to be a collaborative and iterative process.

A comment was received requesting that the future trend in hydrologic flow be projected for the expected life of Project. Dudley Reiser stated that this will be evaluated.

A comment was received requesting that the instream flow assessments have 2 years of data. Dudley Reiser stated that per previous comments, there are constraints to study program that currently won't allow the request.

A comment was received requesting that new HSC/HIS curves be developed for all fish species and lifestages, by season. Dudley Reiser noted that such a request would be a daunting task. Dudley added that all species will be evaluated but not all will have site specific curves developed. Dudley stated that the current approach is to implement a gilded approach where a representative umbrella species would be identified. This approach has been implemented for other projects. Betsy McCracken (USFWS) stated that although there may be some opportunity for overlap of some lifestages, the gilded approach is typically implemented in systems where there is a high species assemblage. Regardless, Betsy stated that she is receptive to providing overlap where it is reasonable. Dudley replied that confirmation that a gilded approach is important but reiterated that development of this approach will be collaborative with continuing discussions by the group.

Matt LaCroix (EPA) stated that there is a general lack of baseline data for habitat use to conceptually identify umbrella species and that he would be interested in seeing a preliminary analysis/organization of how a gilded approach would occur, when it is available. Dudley replied that after a year of study, more information should support the collaborative development of an acceptable HSC/HSI approach.

Dudley stated that currently, the details are not in study plans at this time but much of this will be developed and integrated in a step wise manner. Matt LaCroix stated that sampling effort should be sufficient to capture episodic events. Phil Hilgert added that this summer, to be proactive, some HSC data will be collected and methods tested to inform next year.

A comment was received requesting that model selection be determined in consultation with agencies. Dudley Reiser noted that they are open to this and that subsequent discussions will require a site visit and a discussion with agencies about best models to use to address various objectives. Dudley also reiterated that this is not one model but a suite of models. Phil Hilgert provided a presentation on varial zone modeling that tracks redd disposition during spawning and incubation period on the Skagit River in response to load following activities (effective spawning incubation model). Phil stated that such a model could be used for different conditions, different operations, different locations and different species. Phil also noted that this model could be used to integrate groundwater. Eric Rothwell (NMFS) stated that for redds, a

one-dimensional model would be appropriate; but for post emergence, uni-variate models are not appropriate which is why NMFS stresses the need for collaboration. Eric added that model selection must be justified in study plans. Phil Hilgert agreed that for the purposes of study plan development, concurrence on general direction/approach is the goal, however, working out the details locally with agencies/stakeholders would be preferred. Phil cautioned that a lot of specificity in study plans may reduce implementation flexibility from a FERC process perspective so it is important to have a balance between necessary detail and adaptability. David Turner (FERC) stated that he doesn't need all the study plan details worked out (i.e., transect selection) but also noted that the ILP is flexible enough to allow deviation in study approach, if needed. Dave added that FERC does not need a high level of detail but assurance is required that there is buy-in from stakeholders.

A comment was received requesting that Project alternatives should consider a two dam configuration. Dudley Reiser stated that the current analysis is only pursuing a single dam alternative. Betsy McGregor (AEA) stated, however, that the model will run a variety of flow/operational scenarios similar to a two dam configuration. Mike Buntjer (USFWS) noted that this request was not intended to replicate the 1980s analysis but to just evaluate the option of a re-regulating reservoir to lessen impacts as a component of potential mitigation. Brian Carey (AEA) noted that AEA is currently evaluating the importance of flow variation to better understand value of various flows as they relate to operational scenarios. Wayne Dyok added that this analysis will look at various conditions under various circumstances from load following/displacement to emergency conditions and that this information will be available in September. Eric Rothwell (NMFS) asked range of flows the current evaluation is considering. Brian replied that flows will be evaluated be up to 14,500 cfs. Eric noted this is the maximum flow and that the next steps could be to refine the range. Matt LaCroix (EPA) stated that the focus of EPA's similar comments were related to the need to look at the effects to alternatives for the purposes of NEPA analysis. Matt stated that this does not suggest a high level of modeling for these alternatives but that some modeling activity may be requested to inform a broader analysis required by NEPA. Wayne replied that the analysis of alternatives will be broader and could include a re-regulating structure.

A comment was received requesting that habitat studies be conducted along all affected areas between RM 0-233. Dudley reiterated that the instream flow work is being conducted in the middle reach but that there is habitat work being conducted in upper reach. Betsy McGregor added that the entire zone of influence such as tributary mouths and all reservoir inundation zone habitat, we'll be evaluated but that this would be covered under a different study. Instream flow modeling is from the proposed dam site downstream.

A comment was received requesting the characterization of the natural flow regime including magnitude, frequency, duration, timing and rate of change of hydrologic conditions. Dudley Reiser stated that the hydrologic analysis will address this request.

A comment was received to analyze tributary flow data, particularly Indian and Portage creeks is needed to understand flow inputs from major tributaries. Dudley Reiser stated that the hydrologic analysis to characterize natural flow regimes should address this issue.

A comment was received to map and type tributary habitat in the upper reach. Dudley Reiser noted that this information will be collected as part of the fish and aquatic studies in the Upper Susitna River Reach.

A comment was received requesting that the habitat typing and use information should be integrated into a GIS interface. Betsy McGregor stated that this topic is related to habitat utilization and geomorphology which Bill Fullerton (Tetra Tech) will be discussing tomorrow.

A comment was received requesting that historic salmon run return timing be correlated with available spawning area. Dudley Reiser stated that one could use historic information and information being collected by ADFG to try and address this question but that a correlation to spawning area would still be challenging, especially in the mainstem.

A comment was received that stated that habitat modeling should not be used to assess habitat availability. Dudley Reiser stated that this is the process; collect information on where they are, their utilization, and their availability to try and isolate preference.

A comment was received requesting that all modeling steps be agreed upon and signed off by all parties. Dudley Reiser agreed with this comment.

A comment was received stating that to achieve the desired level of resolution for 2-D modeling, after each field data collections step, the data should be projected in a computer topographic model to identify locations needing more data points. Phil Hilgert agreed with this comment but noted that the timing constraints may require that data is collected when the flows are opportune as opposed to the proposed process. That said, R2 will abide by this process, if possible.

A comment from the Center for Water Advocacy stated that 2-D modeling, such as SRH 2-D, by the BuRec, enable modeling many kilometers of river at fine resolution (<1 m) accurately and quickly. Dudley Reiser stated that there is no proposal to implement 2-D modeling on many kilometers of the river. The 2-D effort will be a strategic application and will be coordinated with Bill Fullerton (geomorphology) and Kevin Featherston (riparian).

A comment from the Center for Water Advocacy requested that effects be studied down to Cook Inlet and identify Project effects on the Cook Inlet ecosystem. Dudley Reiser stated that the first step is to get a sense as to how far downstream load following has effects and adjust appropriately. Phil Hilgert added that there are other water quality and biological issues that may also justify moving the analysis further downstream toward Cook Inlet.

Wayne Dyok (AEA) asked whether the model will extend down to Cook Inlet from the beginning. Michael Lilly (GW Scientific) noted that it will begin at RM 74 and if model outputs

outside the range of natural variability are observed to this point, this may justify expansion further downstream but the analysis will need to be conducted first.

Michael Lilly stated that there was only one groundwater study comment inquiring about the number of years groundwater-surface water interface would be evaluated. Michael noted that up to 3 years of data will be collected depending upon needs but he noted that there is other data available from other sources such as USGS as well. Michael added that the years of data are not as important as events and that collecting data during peak events would be highly beneficial to calibrating models. Other questions may require more extrapolation out over time. Michael also stated that data collection is only one potential source of information and there are other systems that are comparable and can be used to better our understanding.

Riparian Instream Flow Studies

Kevin Featherston (R2 Resource Consultants), the lead on the Riparian Instream Flow Study, stated that he has been working with Bob Henszey (USFWS) on design and noted that there were minimal comments relative to the proposed study design. The only comment that differed between what Kevin and Bob have currently developed goes back to the duration of the study which has been addressed earlier today.

Due to the lack of substantive study comments or requests, Kevin provided a brief overview of the effort developed with Bob Henszey. The Riparian Instream Flow Studies are a modeling effort that will involve synthesis of the 1980s studies but will also sample and model surface/ground water and relationship on recruitment/establishment of riparian species on the floodplain. This study, like others, is a collaborative study that will coordinate with the ice processes study to identify areas of ice break up as it relates to vegetation and with geomorphology leads to examine dynamic areas of channel migration and rates. The study will also interface with the other biological studies. This approach will allow for the characterization of the river into “riparian process domains” which follows an intensive representative reach approach. Bob Henszey stated that the study will also develop suitability curves called “riparian vegetation flow response guilds” grouping species that recruit under similar conditions. These will be developed for vegetation via flow and sediment regimes to achieve similar analyses to the HSC development for fish. Information collected at these sites will allow such guilds to be scaled up from the reach to the river scale. Wayne Dyok asked if the model be able to run scenarios, predict riparian response, and help to identify flow regimes Kevin replied that this is the primary goal of the study.

Agreements

- All Instream Flow Study modeling steps will be agreed upon and approved by all Parties.
- The EFDC Model as the preferred water quality model.

Action Items

- Paul Dworian (URS) will update the Water Quality Study Plan to update the metals sampling list to reflect the discussion at the meeting.
- Paul Dworian will update the Water Quality Study Plan to acknowledge the limitations to using thermal imaging technology.
- Paul Dworian will update the Water Quality Study Plan to provide rationale for proposing only two winter water quality sampling events.
- Rob Plotnikoff will provide in the Water Quality Modeling Study Plan, a rationale for how many additional meteorological stations may be needed for the Upper Susitna River.
- Rob Plotnikoff will provide in the Water Quality Modeling Study Plan, references to examples of successful implementation of the EFDC Model.