



SUSITNA-WATANA

HYDROELECTRIC PROJECT

Meeting Summary
Water Resources Agency Workshop
2012 Studies and Issues
9 a.m. – Noon, December 7, 2011
Held at AEA Project Offices Conference Room,
411 W 4th Avenue, Suite 1, Anchorage, AK

Purpose of Meeting:

Present and discuss 2012 Study Plans.

Attendees:

AEA	Betsy McGregor, Env. Manager
AEA	Emily Ford, Public Affairs
AEA	Wayne Dyok, Project Manager
AEA	Audrey Alstrom
AEA	Doug Ott
Cardno-Entrix	Jim Gill, Assistant to AEA
MWH	Kirby Gilbert
Long View Associates	Steve Padula
Cardno-Entrix	Woody Trihey
Cardno-Entrix	Lynn Noel
Cardno-Entrix	Craig Addley
Cardno-Entrix	Mitchel Katzel
Cardno-Entrix	Steve Nevares
Van Ness Feldman	Jonathan Simon
Tetra Tech	Robert Plotnikoff
Tetra Tech	Bill Fullerton
Long View / NES	John Morsell
Coalition for Susitna Dam Alternatives	Becky Long
DNR; Div. of Geological & Geophysical Surveys	Rod Combellick
USFWS	Betsy McCracken
USGS, ASC	David Meyer
URS	Paul Dorian
USFWS	Mike Buntjer
USFWS	Bill Rice
ADWR	Gary Prokosch
ABR / GWS	Dave Brailey
CIRI	Dara Glass
DOWL HKM	Kacy Hillman

USBLM	Mike Sondergaard
HDR	Robin Beebee
USEPA	Matthew LaCroix
NHI HRC	Jan Konigsberg
ADEC	William Ashton
ADF&G	Joe Klein
ADF&G	Ron Benkert
NWF	Pat Lavin
USFWS	Jennie Spagon
State of Alaska, AG's Office	Brian Bjorkquist
HDR	James Brady
NMFS	Eric Rothwell
USDOJ	Michael Baffrey
Knikatu, Inc.	Tom Harris
NMFS	Sue Walker
E-Terra	Lars Gleitsmann
<i>(None listed)</i>	Scott Crowther
AEA	Bryan Carey
FERC	Paul Makowski (by phone)
MWH	John Haapala (by phone)
R2	Stuart Beck (by phone)
GW Scientific	Mike Lilly (by phone)
ARRI	Jeff Davis (by phone)
3PPI	Sally Morsell (by phone)
NHC	Dave McLean (by phone)
NHC	Gary Van Der Linne (by phone)
EPA	Jennifer Curtis (by phone)

Presentations:

- Kirby Gilbert (MWH): HEC ResSim Description for Susitna-Watana Hydroelectric Project
- Craig Addley (Cardno-Entrix): Review of Existing Water Temperature Data and Models
- Mitchel Katzel (Cardno-Entrix): Determine Bed and Suspended Load by Size Fraction at Tsusena, Gold and Sunshine Gages
- Mitchel Katzel (Cardno-Entrix): Geomorphic Assessment of Middle River Reach using Aerial Photography
- Woody Trihey (Cardno-Entrix): Document the Formation of River Ice Downstream of Watana Dam Site

Questions/Discussion Related to Presentations

MWH – HEC ResSim cross sections

- HEC ResSim is an operations model that includes downstream flow routing coupled with reservoir operations.
- Output will provide hourly flow rates and water elevations at specified transects.
- MWH is starting model development using 1980s cross sections – there are 68 within the Middle Reach below Devils Canyon and 23 between Devils Canyon and the Watana dam site.
- 2012 study plan is to perform additional cross-section surveys initially trying to find 1980s cross-section locations and updating those measurements by establishing vertical and horizontal control points, getting the bed profiles and obtaining roughness values using photography.
- Discussion about what other data might be collected at the same time the transects are being established and measured. Perhaps some site geological conditions such as rock types could be documented.
- Concurrent flow measurements should be taken at each transect during the surveys.
- Need for a current GIS map with locations on aerial photography of all the 1980s transects.
- Discussion about extending cross-section measurements to bankfull to bankfull, or control points above the bank, or 100-yr floodplain. It was noted this model is not being used for flood routing and LiDAR may help establish top of bank in flood conditions.
- There may be a future need for 100-year flood routing to understand sediment transport conditions, and perhaps that can be added to the study later.
- Need to include cross sections in the Lower River Reaches below Talkeetna. Previous transects from 1980s only covered sloughs in Lower River Reach.
- Each transect will have a staff gauge installed and the model will predict surface water elevations. This will be useful in the planning process. The HEC ResSim model presumes the cross sections are static and it is therefore not appropriate to use in analysis of geomorphology or channel evolution processes. Other analyses will address those issues.
- Wayne Dyok, project manager for the Susitna-Watana Hydroelectric project explained how RFPs will be issued for 2012 studies and contractors will be selected for the long-term. During March and April it is anticipated the contractors will brief the agencies and stakeholders to finish off the 2012 study plans. A detailed schedule will be provided by beginning of the year and more about how the 2012 studies will be integrated into the formal study plans.
- There was further discussion that while the initial transect effort will focus on the Middle Reach; the Lower River Reach will also receive attention.

Cardno-Entrix – Water Temperature Data and Models

- It was noted that Cook Inlet Keepers has collected thermal data for tributaries and that Talkeetna has a good meteorological station.
- ADF&G would like more detail and maps of data collection sites to be able to fully comment. ADF&G would like to see the details of the study plan such as type of equipment, sampling protocols, calibration methods – all in the study plans.
- It was noted that the PAD will have very brief discussion of the 2012 studies but the versions of the study plans developed by the contractors would have more detail.
- Temperature recorders are to be placed in the main channel in order to be representative of the longitudinal profile of the river, and not the off channel habitats. Thermal refugia will be picked up by fish habitat and instream flow studies.
- There is not a good understanding of groundwater input and how that affects temperature. Localized influence of temperature on habitat is important in localized areas. However, it will be good to get basic temperature model running first. The current effort is designed to evaluate longitudinal changes and understanding how far temperature changes continue through the system. Stream Network Temperature Model (SNTEMP) provides layered time-series model for riverine temperatures.

Cardno-Entrix – Bed and Suspended Load

- The sediment data will be compared to the flood frequency curve, which is available at the Gold Creek gage; the two-year flood stage is somewhere around 50,000 cfs.
- Discussion that Gold Creek gage has 56-years of record but Sunshine station has less than 10-years of record.
- The 1985 sediment load presented represented the total sediment load, including wash load, suspended sediment and bedload. The total sediment load of the Susitna River, above the three rivers confluence, represents approximately 10 percent of the total sediment load in the Susitna River at the Sunshine gage.
- Cross section surveys are desired to determine if the channel is in equilibrium.
- Need to make sure study sites are well located and characterized so the results can be appropriately extrapolated to the entire river. It was also suggested that multiple indirect studies be implemented to validate results.
- It's important to understand the sediment load from Middle Reach as a proportion of total load through the river system.
- It was noted that the largest riparian changes in the mainstem Susitna River have been observed below the Talkeetna River and that significant sediment inputs likely occur from lateral channel migration and erosion.
- Discussion of rating curves at Gold Creek.
- It was inquired if there would be sites at the Chulitna and Talkeetna rivers to evaluate changes at the deltas of the confluences. This issue is at a finer resolution than this study and other studies will be conducted to predict the changes at the tributary deltas.

- It was asked if passive acoustic methods be employed like hydrophones to extend the sampling. Hydrophones will not likely be used because they would only indicate data on the initiation of bed movement and the number of days bedload is actively moving, but would not provide any information on particle size distribution. The difficulty of sampling during high flows was noted due to inclement weather precluding helicopter access and unsafe boating conditions due to the high flows and high debris loads.

Cardno-Entrix – Geomorphic Assessment

- The study area focuses on the Middle Reach because that is the portion of the river where the geomorphic assessment was conducted in the 1980s using aerial photography at various flows. Lower river 1980s photography is available at the tributary confluences. If the Project arrests sediment movement in the Middle Reach that could lead to significant changes on the Lower River. Due to the width of the river in the lower reach, use of aerial photography may not be adequate to assess potential geomorphic changes.
- The use of aerial photography between the 1980s and today was suggested to evaluate changes in side channels, get some intermediary points to evaluate the rates of change, and to possibly identify the event(s) that caused the channel to change.
- Geomorphic parameters (e.g. width-to-depth ratio, entrenchment) will not be measured in 2012. The 2012 study will be used to characterize the stability of the river, the flow-dependent influence on channel types, channel form and pattern.
- Micro habitats are important and will also be addressed in instream flow studies.
- There was mention of two previous studies that addressed instream flow and habitats including:
 - APA Doc. # 2945: “Response of Aquatic Habitat Surface Areas to Mainstem Discharge in the Talkeetna-to-Devils Canyon Segment of the Susitna River” and;
 - APA Doc. # 3060: “Instream Flow Relationships Report, Volume 1, Final Report December 1985 by Harza-Ebasco/Trihey & Associates.

Cardno-Entrix – Ice Formation

- The ice formation process in the Susitna River was described. Based on 1980s studies, approximately 80 percent of the slush ice in the lower river was transported from the upper and middle river reaches.
- With future Project operations ice could form 4-7 feet higher than current ice cover in the river below the dam.
- What would be the effects of changed ice processes on the Lower River?
- Would the sediment transport regime change with changes in ice flows?
- What would the influence of the lower hydrostatic pressure be on groundwater upwelling?

Kirby Gilbert, Sr. Regulatory Specialist, MWH and Lynn Noel, Cardno-Entrix

Action Items: ¹

- AEA will verify that the documents referenced during Trihey's presentation are electronically available through the Alaska Resource Library and Information Service (ARLIS) at <http://www.arlis.org/>.
- AEA will provide a map of the 91 HEC ResSim transects established in the 1980s.

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