

## *Memorandum For The Record*

August 22, 2003

SUBJECT: Fourth Meeting of the Upper Mississippi River Headwaters ROPE Study Environmental Task Force.

1. Participants: Donald Pierce, Minnesota Department of Natural Resources (MNDNR); Howard Christman, MNDNR; Ray Norrgard, MNDNR; John Steward, MNDNR; Chantel Cook, U.S. Forest Service; Garth Fuller, The Nature Conservancy; Kathy Brophy, City of Aitkin; Robert Zicko, City of Aitkin; Beth Faber, Hydrologic Engineering Center/Corps of Engineers (HEC/COE); Terry Zien, Corps of Engineers (COE); Aaron Snyder, COE; Dennis Holme, COE; Steve Clark, COE.
2. On August 22, 2003, the individuals listed above met at the COE Gull Lake Recreation Area Administration Building near Brainerd for the fourth meeting as the Environmental Task Force (ETF) of the Upper Mississippi River Headwaters ROPE Study. Prior to the meeting, Steve Clark sent out an agenda (see attachment). The meeting agenda was generally followed.
3. The meeting was started with introductions and a review of the status of the ROPE study. It was noted that good progress was being made with the development of the STELLA and PRM models, and that the Environmental Impact Statement (EIS) Notice of Intent was scheduled to be published within the next month.
4. The group briefly reviewed the current and past operational methods for the reservoirs and the resulting hydrology. This included a review of preliminary modeling results for an unregulated condition. It was noted that it is important to avoid referring to the unregulated condition as “natural” or one without the dams in place. The project goal of the ETF is to produce hydrology that is as similar to a natural hydrology as possible, realizing that the dams will remain in place and that average summer reservoir elevations would remain about the same as now.
5. Beth Faber presented information on the methods used to construct and run the PRM (optimization) model, and addressed a number of questions.
6. Terry Zien presented information on the methods used to construct and run the STELLA (simulation) model, and addressed a number of questions.
7. A brief explanation was given for the summary of initial volunteer group model inputs.
8. Steve Clark led a discussion of modeling strategies for environmental effects (see attached handout number 5). No substantial comments were made on the draft strategy at that time and it seemed to be acceptable to the ETF members that were present. This strategy will be developed into a set of methods for incorporating environmental effects into the PRM and STELLA models over the next few months. The services of the Cadmus Group Inc. will be used in the near future to assist in this effort.

9. A number of questions were asked throughout the meeting. Some of those, including responses where possible, follow:
- a. How would exotics be affected by operational changes?
  - b. Is our goal to have the river natural, healthy, or optimized?
  - c. Can adaptive management be used? – Yes.
  - d. Are there opportunities to include physical restorations in ROPE? – Separate restoration projects will likely be recommended by the ROPE Study but will not be designed and/or constructed under the ROPE Study.
  - e. What is the downstream effect on nutrient loading?
  - f. Will changes in operations be a political decision? - Yes. However, those decisions will likely be made using the information that is available. Therefore, it is important that the study be conducted to provide the most accurate information practical.
  - g. What should the timing of drawdowns be? What are the different costs/benefits for duration and timing?
  - h. Could there be town meetings to educate the public? – There will be public meetings to support the study goals and as required by the National Environmental Policy Act (NEPA) for the EIS process.
  - i. *NOTE* - MN Gov. Clean Water Initiative, regarding the Conservation of Fresh Water Resources may be interested in ROPE. (Reed Larson, possible contact).
10. The next meeting was tentatively scheduled to occur on September 29, 2003, at 9:30 a.m. The location for this meeting was not chosen but would occur either at the COE Gull Lake office or the Minnesota Pollution Control Agency office in Brainerd.

Steve Clark, COE  
Environmental Task Force Coordinator

Attached  
Agenda  
Handout 5

**Subject:** Mississippi River Headwaters ROPE Study – Environmental Task Force (ETF)  
Meeting to be held at Gull Lake Recreation Area Administration Building on August 22, 2003

# AGENDA

Welcome / Introductions and Overview of Agenda

Purpose of Meeting -

The primary purpose of this meeting is to obtain your specific inputs for incorporation into the planning models that will be used to analyze and improve the Headwaters systemwide reservoir operations (your inputs are to be focused on the task force objective, interagency, science based, and systemwide in nature). A secondary purpose of the meeting is to keep you updated about the progress being made toward completion of the ROPE study.

Status of Overall ROPE Study

- See **Handout 1**  
(summary listing of ROPE study progress and upcoming events)

Overview of Operations

Historical Review of Corps/Service Operations

- See **Handout 2**  
(graphs of the Historical record – pools and river reaches)

Overview of Operations in the System

- See **Handout 3** description of model nodes and sample annual hydrographs of the existing and natural conditions

Presentation of the HEC-PRM optimization model and the STELLA simulation model

- Q&A

Summary and Discussion on the Model Inputs Provided by Citizen Volunteer Groups

- See **Handout 4** for the summary of inputs received
- Validate, refute, refine inputs received

Document Your Inputs – Discussion and Input of the ETF Perspectives

- See **Handout 5** for the possible input strategy
- Discussion of needed outputs for the models (from a systemwide perspective and for your Task Force's focus)

Discuss Logistics for Next Continuation Meeting, as needed.

Thank You, Summary of Meeting Findings, and Adjourn Meeting

**Handout 5**  
**Modeling Strategies for Environmental Effects – ROPE Study**  
**August 22, 2003**

**Constraints and Problems** – The environment and ecology of the Headwaters reservoirs and rivers are complex and affected by many variables. The relationships between water level management and these resources have not been clearly defined in most cases. However, we need to capture the effects of reservoir operation on these resources within PRM and STELLA in a meaningful way. If this is not accomplished, environmental and ecological resources may not be adequately considered within the context of the ROPE Study. The strategy for how to include environmental and ecological effects as decision factors in these models needs to be developed with coordination through the Environmental Task Force (ETF).

**Draft Strategy** – A tentative strategy for consideration of and development by the Environmental Task Force. This strategy addresses reservoirs separately from rivers and also separates different concerns with the current hydrology. The overall system goal from the Environmental Task Force’s perspective is to produce hydrology similar to that found in an unregulated system.

A strategy has not yet been decided for measuring the effects of changes in operation. An effort is currently under way to develop these methods. It is likely that some simple models will be developed that would measure the effects of each variable selected for incorporation in the PRM and STELLA models. Below is a draft list of variables and the methods by which they may be incorporated into the models.

**A. Lake Variables** – Current lake hydrographs are not consistent with an unregulated system. The main issues of concern are: lower than normal spring stages; high and consistent summer levels; quickly decreasing levels in fall and winter; and lack of periodic extreme events, specifically drought-induced low water. The following variables are intended to be included in the models to address these issues.

**1. Intraannual Variability** – If unregulated intraannual variability is achieved for the reservoirs, the first three issues of concern as mentioned above would be addressed. For each bimonthly step in the model: **Inflow – Evaporation = Outflow** with the average of the “unregulated” summer range equal to the center of the current summer operating band. It will be necessary to apply an upper and lower bound to this variable and measure effects for going above or below it – possibly a percent deviation. Ideas?

Ideas for measure the effects of this within the PRM and Stella models?

**2. Interannual Variability** – By allowing (or inducing) periodic extreme events to occur within lakes, the fourth issue of concern mentioned above would be addressed. It is unlikely that extreme floods would be accepted by the public or supported by the ETF. However, drought simulation (drawdowns) within the reservoirs would likely be supported by the ETF and allowed by the public because many benefits would result and there would be no direct impact on dwellings.

Ideas for measure the effects of this within the PRM and Stella models? It may not be possible (or necessary) to include this in the model. We may have to address this separately. Even so, we will have to measure the effects.

**B. River Variables** – Current riverine hydrographs are not consistent with that of an unregulated system, especially in the more upstream reaches that are more affected by the reservoirs. The main issues of concern are: extreme low-flow events; and high winter flows that result from reservoir drawdown. The following variables are intended to be included in the models to address these issues.

**1. Minimum Flows** – This variable would be designed to protect river reaches from excessively low water where possible. Under natural drought conditions, the drought contingency plan would be followed, and measures found within that plan would be enacted. This variable could be used to prevent the model from reducing flows “unnaturally”. It could also produce results that would show the trade-offs during a drought and would provide valuable information to a drought management team. For this variable, it would be necessary to identify low-flow values with differing levels of environmental impacts. It could be a specific flow for each node or something more universal such as the 7Q10 (although the 7Q10 would have to be adjusted to a bi-monthly value).

Ideas for measure the effects of this within the PRM and Stella models?

**2. Winter Flows** – High winter flows can be stressful for aquatic organisms, especially if flows increase after water temperatures have dropped. For this variable, it would be desirable that after November (?) flows remain the same or gradually decrease until spring thaw.

Ideas for measure the effects of this within the PRM and Stella models?

**3. Variability (?)** – Do we need a third variable to capture natural variability, or can we assume that these variables for the reservoirs would provide that?