UPPER MISSISSIPPI RIVER SYSTEM FLOW FREQUENCY STUDY
(Upper Mississippi, Lower Missouri, & Illinois Rivers)
CITIZENS' PUBLIC INVOLVEMENT GROUP MEETING
November 17, 1998

Final Minutes (Approved 4/28/99)

1. The Citizens' Public Involvement (P.I.) Group held its second meeting on November 17, 1998, in St. Louis, Missouri. A meeting agenda is attached. The minutes below are a summary of the discussions that occurred during the meeting and are not verbatim.

2. The meeting began with Chairperson Paul Soyke (Corps of Engineers, Rock Island District) asking attendees to introduce themselves. An attendance list is attached.

3. The P.I. Group expressed its concern with the study's name change. The name has been changed from "Upper Mississippi, Lower Missouri, and Illinois Rivers Flow Frequency Study" to "Upper Mississippi River System Flow Frequency Study." There was concern that since the names of the Lower Missouri and Illinois Rivers were removed from the study title, that the public would think that those rivers were no longer a part of the study. George Gitter (Corps of Engineers, Rock Island District) explained that the study's boundaries have not changed and that the title change had to do only with the long study name and space limitations on budget documents. **George and Paul will look into assuring that the major rivers in the study are evident in documents that go to the public.**

4. There were no additions or corrections to the minutes (pending approval) of the March 1998 meeting that were mailed to the P.I. Group in May. Charlie Kempf (Ameren/UE) moved that the minutes (pending approval --dated 5/14/98) be approved as final; Jim Whiting (retired farmer) seconded the motion. The P.I. Group voted unanimously to approve the motion. A copy of the final minutes (approved 11/17/98) will be mailed to each P.I. Group member and to the Task Force Chairman for release at his discretion.

5. Arlen Feldman, Chief, Research Division, of the Corps of Engineers' Hydrologic Engineering Center in Davis, California, attended the meeting to answer questions and to explain some of the study's elements. The paragraphs below reflect the questions, answers, and discussions on hydrology that occurred.

a. *Q. (From the March 1998 meeting) - What is the role of the reservoirs in relation to the study?*

A. The study team will look at the natural flow of the rivers and at reservoir regulations and at how much the reservoirs reduce flooding. The first part of the study is concentrating on determining the unregulated frequency curve by analyzing the river system without reservoirs. Reservoirs modify floods, so the team will then look at what happens when a reservoir is added on the system, which will help them determine the impacts of flooding. See attached chart entitled "Table 1 – Flood-damage-mitigation Measures," which Arlen showed and explained to the P.I. Group.

Reservoirs have different functions; however, any significant reservoirs in the river system which have an impact on flooding will be included in the study. Non-Corps reservoirs will be included. Each of the five involved Corps of Engineers districts (Rock Island, St. Paul, St. Louis, Kansas City, and Omaha) will evaluate which reservoirs have significant impacts.

b. Some Group members are concerned about the impact of flooding downstream of Gavins Point. The study will look at the natural flows at Gavins Point to calculate the unregulated frequency curve; and then add reservoirs to compute existing condition flood frequencies.

c. Arlen used a series of graphs to help show how the Corps computes the average annual damages from flooding. Factors include: how often do floods occur? how often does damage from flooding occur?

d. *Q. Which of the eight Missouri River Master Plans will be used? Will the Master Plan be used in the study?* Arlen doesn't know which plan will be used; however, the one that is current at the time will be the one selected. It should be noted that if the Missouri River operating plan does change significantly as to effect peak flows the new operating plan can be examined using the methodology developed in this Flow Frequency study.

(Arlen later amended his answer as follows: Several new operation plans are being considered in that study; the Flood Frequency Study will use the currently authorized plan. It should be noted that if the Missouri River operating plan does change significantly as to effect peak flows the new operating plan can be examined using the methodology developed in this Flow Frequency Study.)

e. FEMA will work with the Corps of Engineers throughout the study. There are a lot of data to look at for this study and the team will look at a large range of possibilities. However, FEMA is interested primarily in the 1% flow *(100-year flood).*

f. The study will develop new flood profiles (stage frequency). It will not look at damages. The information learned in this study will be used for other studies.

g. Other factors used for the study: team will take the levees as they are for this study; risk and uncertainty- looking at a range of possible outcomes will help gain insight; channel roughness values will play a major part - they will be evaluated on a reach by reach basis. It should be noted that this study is using the UNET hydraulic model, which is based on continuity of flow as opposed to the traditional backwater analysis (i.e. HEC-2, HEC-RAS) which uses conservation of energy. Therefore, no conclusion can be drawn by a direct comparison of the friction coefficients (n-value) of the two different hydraulic models.

h. Chris Erickson, Kansas City District, discussed why we're doing the Flow Frequency Study – the team is making its best estimate of the flow/stage frequency relationship. FEMA is also concerned about flood frequencies; e.g., why can there be three 100-year floods in 20 years?

i. The effect the study will have on the PL 84-99 (Emergency Levee Rehabilitation) program concerns the drainage districts. It is vitally important that the study team is well aware of the effects of what impacts this study can have on PL 84-99 program, particularly on the Lower Missouri.

j. Chris said that technically we can have the best flow frequency curves, but policy and politically – it is much more challenging. However, Buddy Arnold of the Corps' Mississippi Valley Division assured the P.I. Group that the Corps is doing the best study it can with the money given.

k. The team will work at mapping the study area until the end of Calendar Year (CY) 1999. They will then put the information in a model at the end of CY99 through 2000 for additional mapping (1-meter contours/4-foot contours). Will go from bluff to bluff. There are two different levee systems up and down the river. Although the Upper Mississippi, Illinois, and Missouri Rivers Association (UMIMRA), who pushed for the study, asked for modeling to the Standard Project Flood, the study will model to a 500-foot flood. Gary Dyhouse of the Corps' St. Louis District said that he is not aware of any Standard Project Flood studies on the main-stem river system.

l. Dave McMurray (Chairman, UMIMRA) said that the Group needs a good definition of how a levee/reservoir regulates flows. Best estimate will be problem - will need to clearly identify levee system -

broaden or more definition. The P.I. Group wants a "band" or "range" that defines the X-% chance flood event. They are fearful of the perception that we use one number to the tenth of a foot to define a particular flood event. 100-year flow - under a variety of circumstances - define results and describe them as best estimate. Public has to understand that reservoirs are identified under a certain set of circumstances.

m. *Are we changing the amount of flow because of concrete – will we get larger runoffs?* The Corps of Engineers' Institute for Water Resources is looking at uncertainty in respect to land use development. The Corps hydrologists do not think so. While it is acknowledged that development in localized areas may increase runoff for small basins, a measurable increase in flows for large basins like the Mississippi and Missouri Basins are extremely unlikely.

n. *Are there studies on what is the effect of wetlands?* The Floodplain Management Assessment, June 1995, examined the effect of wetlands on the 1993 flood event. Due to the large basin size and amount of rainfall in the 1993 event, wetlands would have impacted discharges only in localized areas.

o. *Do wetlands have impacts?* It depends on the area.

(Arlen later amended his answers to questions n. and o. above to the following: Arlen hasn't seen any studies that are definitive for the whole (Upper Mississippi River, Illinois River, and Lower Missouri River) basin area. Several studies conducted by HEC and others show that wetlands only have significant impacts on the magnitude of smaller (say $4 (25-year) or smaller) floods. The Floodplain Management Assessment, June 1995, examined the effect of wetlands on the 1993 flood event. Due to the large basin size and amount of rainfall in the 1993 event, wetlands would have impacted discharges only in localized areas.)

p. *Are the models built so data can be superimposed and the study team can go to next step? (asked by Dave McMurray)* Arlen responded that in most cases you would use same model and run the new data through the same process.

q. *After the Flow Frequency Study, can the Corps promise that there will be no 1-meter error on the Missouri River? (asked by Joe Gibbs)* Arlen Feldman and Chris Erickson stated that they hope there are no errors, but cannot promise there will be no errors. However, there will be more consistency. It was pointed out that the tolerance of the topography being developed is plus or minus the contour interval which is plus or minus one-half a meter. It must be fully understood that any errors that might be in the topography do not relate to the same errors in the profiles.

r. Mike Klingner (Klingner & Associates, P.C.; UMIMRA) stated that confidence (uncertainty) limits with documentation are important and would be helpful. Suggest that the Standard Project Flood and the 500-year flood be calculated. Outcome is a public safety issue. Do a comparison – what level each location has. Will ask the Task Force to do a sensitively analysis.

6. *Q. (From the March 1998 meeting) – Will the Corps of Engineers provide an independent technical expert for the P.I. Group?*

A. Paul responded that, after checking with Rock Island District management, an independent technical expert would not be provided. Arlen and other members of the study's Inter-Agency Advisory Group are able to provide answers to the P.I. Group. Much discussion about this issue followed; comments are summarized below:

a. Paul suggested that if the P.I. Group is not satisfied with information they receive, then they may look at an independent expert if money allows. He stated that the Mississippi Valley Division Engineer may need to be involved in the decision and suggested that, if the group still wanted their own expert, a letter be

written to COL Mudd, Rock Island District Engineer, stating why the P.I. Group would like their own independent technical expert. COL Mudd could then respond to them.

b. Comments made by various Group members: Although there are experts on the study, the experts don't have a farmer among their Group asking questions about how flow will affect his farm (Dave McMurray). Dave also expressed frustration at feeling inadequate after attending the P.I. Group meeting. The P.I. Group needs to understand issues – someone has to help the Group understand. The Group doesn't know what questions to ask about this study. The P.I. Group members would like someone to tell them when an outside expert is needed. Bill Ley stated that he feels that the Corps can give good information, but also thinks an independent technical expert would be good. P.I. Group members want someone to explain the study to the Group so Group can make decisions. Nancy Philippi (Wetlands Initiative) feels that the cost of an expert would not be that much in comparison to the total study cost.

c.. The consensus of P.I. Group was that they would like a technical expert who understands the study from their perspective and that they need to have a role in the selection process. A motion was made that Dave McMurray represent the P.I. Group by writing to COL Mudd about pursuing a technical expert. **The motion was seconded & unanimously approved**

7. *Q. (From the March 1998 meeting) – Will there be an Alternate Dispute Process (ADR) for the study?*

A. Paul replied that since the Flow Frequency Study is a Corps of Engineers study, the Corps will make the decisions. The Division Engineer will solve disputes or they will be solved in the public involvement process. Although FEMA has an ADR process and they are involved in the study, their process has nothing to do with this study.

8. Buddy Arnold stated that we need to explore a better way for the two afternoon groups (Citizens' Public Involvement Group and Corps & Federal hydrologists) to interact, e.g., changing the meeting times. This was not discussed further. Buddy also stated that the Flow Frequency Study is a technical study and is different from the regular Corps studies.

9. The next topic discussed was adopting the charter**. The decision was unanimous to change the title "charter" to "Corps of Engineers Guidelines for the Operation of the Citizens' Public Involvement Group (accepted by the Public Involvement Group)"**. The purpose of the P.I. Group is to give Corps input and the "guidelines" are Corps of Engineers guidelines for operation of the Public Involvement Group. The guidelines are attached.

10. In response to a question of the status of the P.I. Group in comparison to others involved in the study, the Group was told that they have equal status as the other agencies.

11. Arlen Feldman discussed Risk and Uncertainty and what the hydrologists are looking at – Uncertainty, Sensitivity & Risk in the Mississippi, Missouri, and Illinois Rivers Flow Frequency Study.

a. Sensitivity – change the major assumptions (e.g., operating plans at reservoirs or when levees fail) to see how sensitive the resulting frequency curve is to that change?

b. Uncertainty – we don't know Mother Nature's time distribution of floods (we have only a 100-year sample – try to estimate true distribution from sample).

c. Arlen showed other overheads (attached):

(1) "Tasks in IWR Study" – trying to learn from the past

(2) "Climate Trends in the Upper Mississippi River Basin" (Mississippi River at Clinton)

(3) "95% Confidence Interval for Probability Distribution (Log Pearson III) (Mississippi River at Hannibal, MO 1979-1996)"

(4) "Climate Variability and Change and Flood Frequency Analysis"

(5) "Climate Variability and Flood Frequency"

(6) "North Atlantic Oscillation"

d. Mike Klingner stated that as a byproduct of the study, facts about concrete/runoff misconception would be useful. Also, he would like the Climate Trends chart expanded. Much of this information should be made available as it is completed, rather that waiting until the entire study is done.

12. S. K. Nanda, Task Force Chairperson, gave a status of the study.

a. Many groups are involved in the study: 5 Corps of Engineers Districts, 2 Corps Divisions, 7 States, 6 Federal Agencies, the Citizens' Public Involvement Group, a "Think Tank"(National Research Council), and the Corps' Institute for Water Resources (providing information on Risk & Uncertainty). All are working together so we will proceed in fashion acceptable to the Nation.

b. The study is a 3-year effort (1998-2001). This year we received only about one-half the money we need – we're trying to get more.

c. Study results after 2001 – hydrology (define flow frequency), hydraulics (will fly floodplain and do digital floodplain mapping).

d. S. K. met w/FEMA Agencies V and VII and discussed what assumptions would be made as to when a levee would fail. Will have a hydraulic model for entire the Missouri and Mississippi River system - will run model on flows – will talk to public & FEMA – not married to any one assumption now. The P.I. Group will have opportunity to see assumptions

e. The study team hasn't decided how much risk and uncertainty to do – run flows for hydraulic models – what percent of reliability of elevation being exceeded?

f. FEMA will define base flood elevation

g. Dave said that the P.I. Group wants an awareness of the assumptions and the Group needs to understand them.

h. At the next meeting, Arlen will discuss the assumptions that the study team is making in defining flow frequency. The unregulated flow frequency is being studied first; many flood and stage frequency analysis methods are being evaluated. The study team will make assumptions in each step.

i. *Will other programs other than UNET be available?* UNET is the Corps of Engineers standard 1-D digital hydraulic unsteady flow model; steady-state hydraulic models like HEC2 will not be used. FEMA is being included in the study from the start to ensure mutual understanding of the results. Digital cross-sections include all of the channel and overbank areas – and will be public information. The study team is considering how to publish the data; one of the main sources will be the UNET model input data.

j. *Will what the group finally comes up with be used?* This is not a Corps of Engineers study, it is an interagency study. FEMA will go to public meetings to discuss findings. The study will not be political. S. K. Nanda will assure all agencies are unanimous in the method, process and final outcome of the study.

k. *The P.I. Group asked S. K.* w*hat the Interagency Group might want from the P.I. Group?*

(1) The Group's questions/concerns go through Paul to the Task Force. The Group can ask questions/make statements at the Task Force meeting if there is an issue that Paul does not address

(2) Arlen – maybe the Corps and Federal agency hydrologists would want to know what P.I. Group/public want to see as a result of the study

l. The P.I. Group told S. K. it wants its own expert to represent the Group's viewpoint as to what's going on from the public's perspective so the Group can make intelligent comments. Also, the Group has no expert in mind. S. K. Nanda will discuss with Dave to determine if the Corps of Engineers would pay for an expert.

m. If the Group gets a technical expert, they would like an hour or so with him/her without the Corps' attendance.

n. The Group wants to know assumptions Interagency group is making

13. Discussed "stochastic" – statistically varying climate driving forces, pressure system, rain – may be driven by man's activities & Mother Nature's activities. The study team will look at the data they have more confidence in such as historical records and current (better) data.

14. Concern that study results may not have an impact on Missouri River Master Manual

15. The P.I. Group offered the following suggestions for upcoming newsletter articles:

a. Address the study and its goals.

b. Information on the P.I. Group: a summary with input from the Group, membership listing, and an explanation of the role of the Group.

c. Bluff to bluff information in layman's terms.

d. Discuss the value of wetlands – clear up misinformation.

e. Stress what study is <u>not</u> (looking at one set of relationships) – will provide data that political decisions may be based on.

f. Get viewpoints on the study's results from FEMA, USGS, NRCS and what their involvement is in the study.

16. Report to Task Force. The P.I. Group asked that Paul Soyke bring the following concerns to the Task Force at their 18 November meeting:

a. Change the title of the study back to original title to include Missouri and Illinois Rivers.

b. FEMA policy.

c. Assumptions – levee overtopping.

d. Risk and uncertainty limits -- bands of the uncertainty should be shown rather than a single point.

e. Can we show the Standard Project Flood (SPF) calculations?

f. Impact of frequency at lower lines and impact on Public Law 84-99.

g. Alternative selection for operation of Missouri River – will the P.I. Group be involved? When will the decision be made? Will the Group & the public have the opportunity to comment on Master Plan for Missouri River? Comment on alternatives?

h. Sensitivity issues need to be presented about issues such as what critical assumptions are made.

i. The P.I. Group would like an independent technical expert.

j. How can we get interim information and useful data out to the public?

k. Concern about data formats and public availability.

l. Document the rationale behind decisions and assumptions.

m. Make sure that the Task Force considers what information they want from the P.I. Group.

n. Get interim information out to the P.I. Group when available.

17. An agenda will be sent out before the next meeting and the P.I. Group will be asked to comment on the agenda items. The assumptions used in the study will be discussed at the next meeting. The assumptions will be sent to the Group 2 weeks ahead of time.

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Recording Secretary
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Attachments