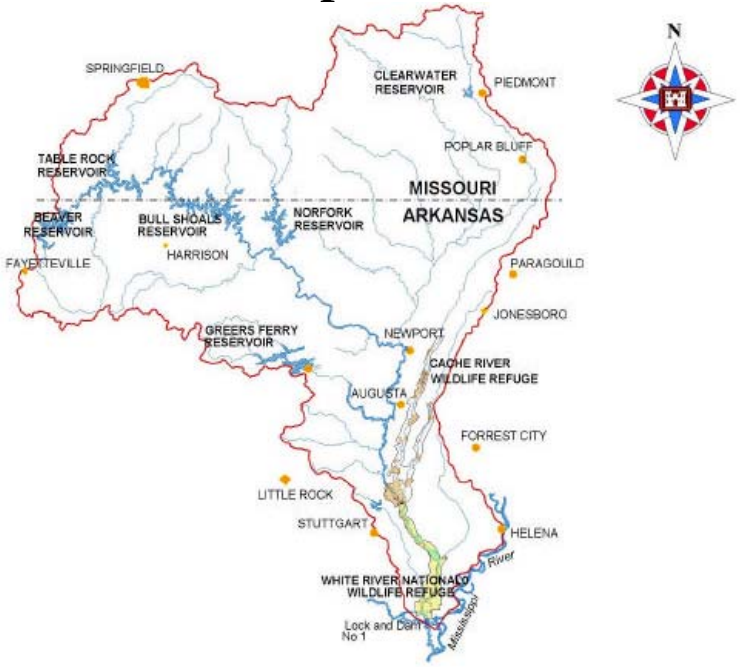
Project Management Plan

FY 2010

Project Title:
White River Basin-Wide Comprehensive Study

Project No.: 110202

Location: Memphis District, USACE – AR & MO



Document History:

	DATE	DESCRIPTION & LOCATION WITHIN PMP OF REVISION	DATE APPROVED	APPROVED BY
Original PMP	Oct 2001	Original Document	Oct 2001	DPM
Revision # 1	Aug 2009	(1) Incorporates new planning template, Review Plan and Recon Report, (2) updates PDT, Risk Analysis, and FSCA.	Aug 2009	DPM
Revision # 2	Dec 2009	Update Project Timeline and PDT team members	Dec 2009	DPM

PMP ACCEPTANCE SHEET

I have reviewed this document and certify that it contains accurate content and is sufficient to guide project execution.

Senior Project Manager	Clyde Hunt	14 Dec 09 Date
Senior Project Manager	Jackie Whitlock	14 Dec 09 Date
Study Manager	Jason Allmon, P.E.	14 Dec 2009 Date
Economist	Dr. Ian McDevitt, D.B.A.	12/14/2009 Date
Project Biologist	Edward Lambert	12/14/09 Date

Approved By:

Chief, Planning, Programs & Project Management	Edward E. Belk, P.E.	12/14/09 Date
Chief, Engineering & Construction Branch	Thomas L. Minyard, P.E.	12/18/09 Date
Chief, Real Estate Division	Terry Rupe	12/18/09 Date
Chief, Contracting Division	Jean F. Todd	21 Dec 09 Date

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LIST OF APPENDICES

1.0 SCOPE OF WORK:

Study Area Description. The White River basin comprises approximately 27,765 square miles, of which 10,622 square miles are in the southern part of Missouri and the remaining 17,143 square miles are in northern and eastern Arkansas. The White River basin contains 5 large Corps multi-purpose lakes: Beaver, Table Rock, Bull Shoals, Norfork, and Greers Ferry. Clearwater Lake is also operated by the Little Rock District Corps of Engineers; however, it is a smaller lake primarily used for flood control. The White River basin includes over 150 miles of flood control levees along the White River and its tributaries.

Interest in the basin includes flood control, water supply, hydropower, navigation and other modes of transportation, environmental restoration and protection, and recreation. Portions of the White River basin are Federal lands associated with the USDA Forest Service and/or the Department of Interior. The lower portion of the basin is significant as a migratory waterfowl wintering area and includes several Federal wildlife refuges and state management areas that comprise one of the largest remaining areas of bottomland hardwood forest in the Mississippi Valley.

The White River Basin is comprised of the following congressional districts: Berry, AR-01; Snyder, AR-02; Hutchinson, AR-3; Ross, AR-04; Skelton, MO-04; Blunt, MO-07; Emerson, MO-08.

Study Purpose. The purpose of the study is to develop a comprehensive watershed plan for the White River Basin. The plan will serve as a framework for the environmentally sustainable development of water resources within the White River Basin. The problems and potential solutions will be examined in a comprehensive manner, due to the interrelationships of the problems and potential solutions to all of the significant resources in the basin. The study will identify water resources needs and opportunities. Potential study outputs address water resources needs for water supply, flood control, waste water management, navigation, recreation, power generation, and other water resources related needs identified in the comprehensive study.

Current On-going Items: See Appendix A of the original PSP dated October 2001 for further details regarding each item.

(ESWM) Study: Since the original PSP was generated in 2001, another item was added to the study scope: The Ecologically Sustainable Water Management (ESWM) Study. ESWM is a process of quantifying ecosystem flow needs and managing the uncertainty associated with the quantification process. Uncertainty of data and knowledge gaps are explicitly identified and systematic management of such issues is important to the process of quantifying the flow needs. The process relies on the best available science combined with knowledge and best professional judgment of a diverse group of scientists with local knowledge and expertise. Ecosystem flow needs should be defined in spatially and temporally specific terms. Once quantified ecosystem flow needs can be combined with the requirements of other water resource users such as hydropower production, navigation, agriculture, and water supply to formulate ecologically sustainable water management plans that ensure the long-term viability of basin water resources for all users. Too much alteration of natural flow variability can have serious geomorphologic

and biotic implications. Each flow level is important to certain geomorphic or ecological functions. The goal is not to create optimal conditions for all species all of the time; rather, to create adequate conditions for all native species enough of the time. It is anticipated that this study will take place in Fiscal Year 2010. The Sponsor is The Nature Conservancy, and Matt Lindsey is the primary point of contact, Telephone: (501) 614-5087.

ITEM	Percentage COMPLETE	STATUS
Wetland Effects of Blockage Removal at Grubbs (Dr. Heitmeyer)	70	Fully funded contract with URS
Study-Evaluate Environmental Benefits of Sediment Reduction (Dr. Heitmeyer)	90	*Big Creek Sub-Basin*
Evaluate Ecosystem Restoration Options (Dr. Heitmeyer)	50	*Cache River and Bayou DeView Basins*
Forebay Oxygen Diffuser Report	95	Initiated by TVA FY08 on Table Rock Lake; Work promoted by MO Dept. of Conservation. March 2009 additional work added to TVA scope.
Sedimentation Study	15	NRCS submitting Big Creek data; USDA-ARS agreement pending-D&F with subsequent MIPR being processed
Water Quality Analysis - Upper White River	50	FY07 work complete; D&F at MVD for similar FY08 work for MO DNR
Conceptual Model	100	
Beaver Lake Water Quality Model	100	2-D Study
Delineate & Digitize Hydrologic Units	100	
Aquatic Ecosystem Fisheries Study	95	Final report due from ERDC
Recreation Study, Phase I	100	ERDC completing report – March 2008
Unsteady Flow Model	35	Mouth to Clarendon complete; Clarendon to Newport In-progress. Field data collection 95% complete.
Cache River Surveys	100	Completed 15 cross sections
Ecologically Sustainable Water Management (ESWM)	0	Working with Sponsor to identify facilitator.

1.1 Study Purpose and Goals:

The study purpose is to develop a comprehensive watershed plan for the White River Basin. The comprehensive plan will serve as a framework for the environmentally sustainable development of water resources within the White River Basin. The problems and potential solutions will be examined in a comprehensive manner because of the interrelationships of the problems and potential solutions to all of the significant resources in the basin.

The primary objectives of the study are to comprehensively analyze the basin problems and opportunities and find possible solutions to these needs. The comprehensive study may or may not recommend further Corps studies or projects. Some alternatives may be identified that will be implemented by other Federal, state, or local agencies. In order to accomplish this, the significant resources in the basin will be identified. A conceptual "model" will be developed to describe the interrelationships of the significant resources in the basin to provide a framework for evaluation of alternatives. This model will be descriptive and likely diagram various functions and processes in the basin. This will serve as a guide in determining the completeness of the studies and allow information gaps to be filled prior to completing studies. The structure, functions, and processes of the ecosystem will be identified under the framework of this conceptual model.

The existing conditions of the resources will be examined and projections made of the future conditions of the resources. Information produced by the study will be utilized during analysis of ongoing projects and studies. Likewise, information gathered from ongoing studies will be incorporated into the comprehensive study. The comprehensive study will be used in evaluating operation of existing projects.

The primary goal of the comprehensive study is to develop a basin-wide comprehensive plan of improvement. To determine this, we formed an interagency planning team consisting of Federal and State agencies from both Missouri and Arkansas and stakeholders from the basin. The interagency planning team has met on several occasions to identify the needs of potential sponsors and to further define what is necessary for a basin-wide comprehensive study. Every effort is being made to accommodate the sponsors' needs; however, cost constraints have limited the detail in some cases.

The PDT will hold regular meetings, conference calls with interagency sponsors and host an annual Interagency Meeting in order to manage and contain the study scope and creep. At the annual Interagency Meeting we will evaluate the scope to verify that we are providing the products and services that we agreed to provide. At this point in the study, we are not able to add any additional items to the study scope.

2.0 PROJECT DELIVERY TEAM:

See Appendix 1 for a list of the Project Deliver Team members, with contact information.

2.1 Roles and Responsibilities:

a. Customer Representative/ Project Sponsor:

1) Arkansas Game and Fish Commission, Mr. Scott Henderson (or Mr. Craig Uydea)
2) Arkansas Waterways Commission, Mr. Keith E. Garrison
3) Arkansas Natural Resources Commission, Mr. J. Randy Young (or Mr. Kenneth Brazil)
4) Arkansas Natural Heritage Commission, Ms. Karen Smith
5) The Nature Conservancy, Mr. Scott Simon (or Matt Lindsey)
6) Department of Conservation, Mr. John D. Hoskins (or Mr. Mike Smith), and
7) Missouri Department of Natural Resources, Mr. Mark Templeton (or Mr. Michael D. Wells).

The primary role of the customer is to provide input and express interest in the project to their congressional representative.

b. Project Manager: Clyde Hunt / Jackie Whitlock. The primary role of the project manager will be to provide funding allocation, monitor study progress and costs, and interface with the project sponsor. The project manager will prepare budgetary reports and lead study team meetings.

c. Chief, Engineering & Construction: Thomas L. Minyard. The primary role of the Chief of E&C is to ensure team members under his command are allowed to work on the various project features. Approval of this PMP is a secondary role.

d. Chief, Contracting Division: Jean F. Todd. The primary role of the Chief of Contracting is to ensure team members under her command are allowed to work on the various project features. Approval of this PMP is a secondary role.

e. Chief, Real Estate: Terry Rupe. The primary role of the Chief of Real Estate is to ensure team members under his command are allowed to work on the various project features. Approval of this PMP is a secondary role.

3.0 CONSTRAINTS

Project Funding Limitations in a given Fiscal Year. Many of the study items are multi-year and cannot begin until funds are received. The longer it takes for funds to be allocated, the longer the study will take to complete. If optimum funding were made available, the schedule for the reevaluation could be expedited resulting in completion of the study by October 2014.

4.0 WORK BREAKDOWN STRUCTURE:

The WBS is a deliverable-oriented, pictorial decomposition of the scope of the project. It is product-oriented to facilitate performance measurement. The WBS specifies the task and subtask necessary to fulfill the objectives of the project. It is used to represent how the work activities are to be organized and is a display of the many products that roll-up into the total project. The WBS is independent at each of its levels, integrated, manageable within an organization's capability, measurable, and covers all work to be accomplished. The WBS will be updated in Revision #2. See Appendix F of the original PSP (Appendix 14).

5.0 ACQUISITION PLAN:

During this "Feasibility" Phase of this study, all efforts will be performed by a combination of in-house personnel, other government agencies, other Corps Districts, Sponsors, and A-E contractors. To the maximum extent possible, an effort will be made to use Small Hubzone, in order to meet the District's Goals. An acquisition plan will be developed at the appropriate stage of the project.

6.0 RESOURCE MANAGEMENT

6.1 Command Management Review

The Command Management Review (CMR) is a quarterly review and analysis process used by senior leaders of USACE to assess performance trends of USACE. The Consolidated Command Guidance (CCG) contains USACE directorate performance measurements, to include the functional area, proponent, indicator and evaluation visibility level, source of data, definition, calculation, rating criteria, and governing regulations or law. HQUSACE creates performance measures for presentation at the CMR that are developed to portray command attainment of corporate objectives. CMR data is web-enabled and generated automatically and continuously from within P2. Command performances for critical functional areas are evaluated and assessed in accordance with CCG requirements and rating criteria. All applicable CMR charts contain assessed ratings of red, amber or green, and a narrative on USACE goals and achievements. HQUSACE develops the CMR charts using P2 data, allowing subordinate commands to provide comments directly to applicable charts. The HQUSACE CMR provides HQUSACE staff principals, commanders and their staffs the ability to address corporate measures of operational performance. These measures are portrayed and compared to depict a USACE-wide status report that identifies areas for improvement and promotes sharing of best practices.

6.2 CCG (Consolidated Command Guidance) Requirements

The USACE Consolidated Command Guidance (CCG) is published by Headquarters and is normally released during the June/July timeframe. Directors, office chiefs and managers are responsible for review and compliance with performance requirements established in the CCG. The Resource Management Officer or designee is responsible for facilitating quarterly CMR sessions with the Commander and senior/executive staff to assess command performance and mission execution. The performance requirements

established in the CCG will be based on earned value management principles. Here is the most recent link to the CCG: https://corpsinfo.usace.army.mil/rm/.

6.3 Cost Sharing Agreement

WRDA 2007 modified the cost sharing requirement to 75% Federal, 25% non-Federal. The Feasibility Cost Share Agreement (FCSA), along with Amendment 1 of the FCSA, are provided at Appendix 11.

7.0 SCHEDULE:

Changes in schedule will be addressed as described in the Change Control Plan. If changes to subproduct funds or the schedule exceed those listed above, a Schedule & Cost Change Request (SACCR) must be prepared by the Project Manager for incorporation of the schedule changes and reassignment of funds.

7.1 Network Analysis: See Appendix 13 of this report for the Network Analysis Schedule. This will be continuously maintained and show actual completion status.

7.2 Milestones: These milestones are based on an adequate funding stream, not the historic project funding stream.

CW035 Post Peer Review Plan 14 FEB 2008
Represents the initial date the plan was approved and posted. Initial work allowance will not be issued for any study leading to authorization (except for the funds needed to complete a peer review plan) unless and until the peer review plan is posted and approved by the MSC on the HQUSACE website. Peer Review plans are required for decision documents that require authorization by the U.S. Congress.

CW042 Complete PMP Revision 4 JAN 2010
This provides the finish date for the Revised PMP document when all signatures have been provided for approval. May have multiple codes within a project; typically done at the start of each new phase of work/new WBS.

CW140 Start Study 15 NOV 2000
This provides the start date for the initiation of the Study after funds have been received.

CW160 Submit Final Report 31 OCT 2016
This provides the finish date of the Final Report Document that has been submitted to the next higher headquarters for review.

8.0 PROJECT QUALITY CONTROL PLAN AND OBJECTIVES:

The project quality control plan is addressed in the original Project Study Plan dated October 2001. See Appendix H of the original document for further details.

Total Quality Management. During the general evaluation process, total quality management for the project would be achieved by periodically holding study team meetings to review completed

work activities, discuss current status of project, and determine future tasks related to project development. The local sponsor will be informed on a regular basis concerning the overall status of the project through written correspondence, telephone conversations, and/or formal and informal briefings. Close coordination will be maintained to ensure a quality product is being developed that will meet both Federal and non-Federal objectives in a timely and cost-effective manner. The quality of the project will be managed using both a Design Quality Management Plan and a Construction Quality Management Plan.

Management Control Plan. Management of the project will be accomplished using cost and schedule performance controls. A centralized project cost history will be developed and maintained for the project by the Project Manager for audit purposes throughout the course of the PED phase. The Project Manager will compare actual schedule and cost performance to the current approved schedule, and will indicate if the project is within budget and on schedule. The Project Manager will manage, analyze, assign and control all project and study costs/budgets in accordance with those contained in the approved PMP.

9.0 RISK ANALYSIS

Risks associated with the White River Comprehensive Project have been identified. The project specific Risk Information Sheets document identified risks, descriptions, causes, WBS impacts, and project objectives impact, risk owner and responsibility, agreed response, and expected result of response. See Appendix 4 for further information.

Security Plan. No component of the project is classified as being sensitive to national security. Any changes in the status of the project security classification will be coordinated with the District's Security Officer. .

10.0 SAFETY AND OCCUPATIONAL HEALTH PLAN

All field work conducted by the Memphis District will adhere to the safety precautions outlined in the Corps of Engineers Safety Manual, EM 385-1-1. The Corps of Engineers is committed to take all reasonable precautions to protect the safety and health of its employees, contractor personnel and members of the public. This project will not enter the PED phase; therefore, the Safety and Occupational Health Plan (SOHP) will not be developed.

11.0 CHANGE MANAGEMENT:

Change Management is one of the most important activities undertaken by the PDT. It is the process by which proposed changes in a project are evaluated, agreed upon, documented, and implemented. Approved changes become the basis for adjusting baseline performance measures, and thus impact the achievement of previously agreed-upon quality objectives established for project success. The PDT must reach agreement on all proposed changes, or resolve conflicts. Changes are defined as any activity or influence that could potentially impact or disrupt the scope, schedule, budget, or any aspect of the planned execution of a project. Significant changes, i.e., those which cross the thresholds defined by the project's Change Management Plan, will prompt updates to the PMP. The Change Management Plan identifies the thresholds requiring controlled modification to governing PMPs or any of their constituent plans.

The Project Delivery Team (PDT) is responsible for notifying the PM as soon as they become aware of any potential need for modifying or updating the PMP or any of its constituent plans. This includes identification of changes identified by the customer, PDT members, other USACE representatives, Resource Providers or District Quality Management Representative (QMR). The Project Manager (PM) is responsible for overall project change control, as addressed in Change Management Plan (included as Appendix 9).

Change Control Plan. The PMP outlines for the Project Manager, Study Manager, and other functional managers schedule, work assignments and use of project funds. The project manager will monitor physical and fiscal progress of all work required for completion of the project and, based on that review, effectively manage project funds and maintain the project schedule. Changes in funds or schedule requirement will be controlled by reallocating funds between work activities, work elements, or subproducts as long as funds are not exceeded or the quality of the subproducts is not jeopardized. If changes to subproduct funds or the schedule exceed those listed above, a Schedule & Cost Change Request (SACCR) must be prepared by the Project Manager for incorporation of the schedule changes and reassignment of funds. See Appendix 7 for the Schedule & Cost Change Request (SACCR) form.

PM Coordination Process for Potential Schedule or Method of Execution Changes. See Appendix 8 for the process for potential schedule and method of execution changes.

Form 17. On a periodic basis, Project Cost Estimates will be updated using Form 17. Form 17 identifies the previous estimated cost, the current estimate, and the fully funded estimate. The fully funded estimate is the real cost of the project including the time-value of money. At the feasibility phase, cost growth to the plan will not require customer approval. Customer approval will be required once we enter into a cost sharing agreement.

12.0 COMMUNICATIONS:

Communication Plan. The purpose the communication plan is to establish an internal and external communication strategy and determine the information needs of all project delivery team (PDT) members and stakeholders – who needs what information, when they will need it, how it will be given to them, and by whom. The complexity of the project and impacts to the PDT and stakeholders will determine the appropriate level of detail for the Communications Plan for the project. The Communications Plan for the project is a supporting document that facilitates the implementation of the Project Management Plan (PMP). The Communication Plan can be found at Appendix 5.

Communications occur in two major arenas; internal to the PDT and external to the PDT. The following paragraphs describe our approach to communications.

- The PDT will communicate both internally and externally with face-to-face meetings, through email, and with written correspondence. A project website may be used as appropriate.

- Team meetings will be scheduled as necessary to ensure project execution. The customer(s) will be invited to meetings as necessary.
- Project records will be maintained by the PM, and transmitted to PDT via email or CD.
- The PM has read the Customer Satisfaction procedure as outlined by the strategic plan. Customer surveys will be sent-out annually. Customer satisfaction survey should be sent to:
    1. Ms. Karen Smith, Arkansas Natural Heritage Commission, 1500 Tower Building, 323 Center Street, Little Rock, AR 72201, Telephone: 501-324-9614, E-mail: Karen@arkansasheritage.org.
    2. Mr. Mike Smith, Missouri Dept of Conservation, 230 Commerce Drive, Suite 301, Jefferson City, MO 65109, Telephone: 573-522-4115, ext 3152, E-mail: Mike.Smith@mdc.mo.gov.
    3. Mr. Keith Garrison, Arkansas Waterways Commission, 101 E. Capitol, Suite 370, Little Rock, AR 72201, Telephone: 501-682-1173 (office), 501-221-1874 (home), E-mail: keith.garrison@mail.state.ar.us.
    4. Mr. Matt Lindsey, The Nature Conservancy, Arkansas Field Office, 601 North University Avenue, Little Rock, AR 72205, Telephone: 501-614-5087, 870-995-3480 (cell), E-mail: mlindsey@tnc.org.
    5. Mr. Kenneth W. Brazil, Arkansas Natural Resources Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201, Telephone: 501-682-3980 (office), E-mail: Ken.Brazil@Arkansas.Gov.
    6. Mr. Michael D. Wells, Missouri Dept of Natural Resources, P.O. Box 176, Jefferson City, MO 65102, Telephone: 573-751-4732 (office), 573-690-0277 (cell), E-mail: mike.wells@dnr.mo.gov.
    7. Mr. Craig Uyeda, Arkansas Game & Fish, Telephone: 501-978-7303, E-mail: ckuyeda@agfc.state.ar.us.
- Other stakeholders who would benefit from regular communication are as follows:
    1. Mr. Michael Armstrong, Arkansas Game & Fish, Chief of Fisheries, Telephone: 501-223-6371, E-mail: mlarmstrong@agfc.state.ar.us.
    2. Mr. Andy Austin, Missouri Department of Conservation, Telephone: 417-895-6881, E-mail: andy.austin@mdc.mo.gov.
    3. Ms. Susan Bolyard, USGS Fayetteville, Arkansas Office, Hydrologist, Telephone: 479-442-4888, E-mail: sbolyard@usgs.gov.
    4. Mr. Marshall Boyken, Southwestern Power Administration, Telephone: 918-595-6684, E-mail: marshall.boyken@swpa.gov.
    5. Ms. Stacy Burks, Sen. Kit Bond's Office, Telephone: 417-864-8258, E-mail: stacy_burks@bond.senate.gov.
    6. Ms. Michelle Clendenin, NRCS, E-mail: Michelle.Clendenin@ar.usda.gov.
    7. Ms. Dana Coburn, U.S. Army Corps of Engineers, Little Rock District, Telephone: 501-324-5601, 501-749-5262 (bb), E-mail: Dana.O.Needham@us.army.mil.
    8. Jerri Davis, USGS, Telephone: 573-308-3829, E-mail: jdavis@usgs.gov.
    9. Mr. Charlei DuCharme, MODNR, Telephone: 573-751-3682, E-mail: charles.ducharme@dnr.mo.gov.
    10. Mr. Dennis Evans, USGS Arkansas Water Science Center, U.S. Geological Survey, Telephone: 501-993-3918, E-mail: daevans@usgs.gov.

11. Dr. Reed Green, USGS Arkansas Water Science Center, U.S. Geological Survey, Telephone: 501-228-3607, E-mail: wrgreen@usgs.gov.
12. Dr. Mickey Heitmeyer, Greenbrier Wetland Services, Rt. 2. Box 2735, Advance, MO 63730, E-mail: mheitmeyer@greenbrierwetland.com.
13. Mr. Jon Hiser, USACE - Little Rock District, Telephone: 870-425-2700, E-mail: jon.hiser@us.army.mil.
14. Mr. Stan Jones, USACE, Telephone: 417-334-4101, E-mail: stanley.g.jones@usace.army.mil.
15. Mr. Gay Lacy III, Arkansas Waterway Commission, Telephone: 870-523-3736, E-mail: gaylacy@gmail.com.
16. Dr. L. Yu Lin, Christian Brothers University / U.S. Army Corps of Engineers, Memphis District, Telephone: 901-544-0909, E-mail: llin@cbu.edu, L.Y.Lin@mvm02.usace.army.mil.
17. Mr. Bob Morgan, Beaver Water District, E-mail: rmorgan@bwdh2o.org.
18. Mr. Ryan Mueller, Missouri Department of Natural Resources, Director, Water Resources Center, Telephone: (573) 751-1134, E-mail: ryan.mueller@dnr.mo.gov.
19. Mr. Earl Pabst, Department of Natural Resources, E-mail: earl.pabst@dnr.mo.gov.
20. Ms Fritha Ohlson, Southwestern Power Administration, Telephone: 918-595-6684, E-mail: fritha.ohlson@swpa.gov.
21. Mr. Mark Oliver, AGFC/Little Rock – Fisheries, Telephone: 501-978-7336, E-mail: mloliver@agfc.state.ar.us.
22. Mr. Paul Port, Arkansas Game & Fish, Telephone: 870-404-2159, E-mail: prport@agfc.state.ar.us.
23. Mr. Mark Sattelberg, Arkansas U.S. Fish and Wildlife Service Field Office, E-mail: Mark_Sattelberg@fws.gov.
24. Mr. Ken Shirley, Arkansas Game & Fish, Telephone: 877-425-7577, E-mail: kshirley@agfc.state.ar.us.
25. Mr. Jeff Williams, Arkansas Game and Fish Commission, Trout Management Supervisor, Telephone: 870-424-5924, E-mail: j_williams@agfc.state.ar.us.

Reporting Requirements. Upward reporting by the Memphis District Corps to higher authority, MRC and HQUSACE, will be in accordance with ER 1105-2-100, Planning Guidance Notebook. The local sponsor(s) will be informed on a regular basis of study progress through periodic meetings and briefings and updates via telephone conference calls. Minutes of the meetings and telephone conversation records will be kept throughout the study.

13.0 VALUE MANAGEMENT PLAN

Value Management (VM) principles will be use on this study; however, since this project will not go to construction, a Value Engineering Study will not be performed. VM is a process used to facilitate and encourage the understanding, consideration, and integration of the needs of all customers, PDT members, partners, and stakeholders. Value Management seeks the highest value for a project by balancing resources and quality. The VM process emphasizes the use of multi-disciplinary teams and their resulting synergy, using a functional analysis approach for

decision making. It is a management tool that should be applied continuously throughout the life cycle of projects and programs. The overall goal of the Value Management (VM) effort is to ensure the product development and execution processes are in compliance with Federal Laws pertaining to the use of value methodology; and to identify possible cost savings and project enhancement options. The objectives of the VM effort are to: validate current alternative strategies, identify and address pertinent issues that may impact the implementation and effectiveness of the current alternative strategies, and provide recommendations for future research needs.

14.0 CLOSEOUT PLAN:

The PDT's goal is to achieve financial closeout after substantial completion in accordance with the USACE CCG. The turnover document is the White River Comprehensive Watershed Resources Management Plan.

U.S. Army Corps of Engineers, Memphis District will deliver the turnover document, through the Mississippi Valley Division, to the USACE Headquarters office. Once HQUSACE has approved the Watershed Resources Management Plan, the completed document will be provided to the project sponsors for their use.

APPENDIX 1
PROJECT DELIVERY TEAM (PDT) MEMBERS

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PROJECT DELIVERY TEAM (PDT) MEMBERS

Name/Position	Phone Number	E-mail
Hydraulic Engineer Dr. L. Yu Lin, Ph.D., P.E.	901-544-0909	L.Y.Lin@usace.army.mil
Hydraulic Engineer Cole H. Smith	901-774-1279	Cole.H.Smith@usace.army.mil
River Engineer Bennie Wilkinson, P.E.	901-544-4314	Bennie.W.Wilkinson@mvm02.usace.army.mil
Geographic Information System Jennifer Rodriguez, P.E.	901-544-0662	Jennifer.M.Rodriguez@usace.army.mil
Geographic Information System Kevin Bingham, P.E.	901-544-0778	Kevin.D.Bingham@us.army.mil
Geotechnical Engineer Nicholas Bidlack	901-544-4017	Nicholas.Bidlack@us.army.mil
Cost & Relocations Jim Jetton, P.E.	901-544-0657	Jim.Jetton@us.army.mil
Civil Design Branch Frank Mills, P.E	901-544-3479	Frank.Crouthers.Mills@us.army.mil
Construction Branch Delwick Warfield, P.E.	901-544-0656	Delwick.E.Warfield@mvm02.usace.army.mil
Supervisory Project Manager Clyde Hunt, P.E.	901-544-3115	Clyde.E.Hunt@usace.army.mil
Senior Project Manager Jackie Whitlock, P.E	901-544-3832	Jackie.S.Whitlock@mvm02.usace.army.mil
Study Manager Jason Allmon, P.E.	901-544-0766	Jason.E.Allmon@us.army.mil
Program Analyst Hattye D. Thompson	901-544-0660	H.Thompson@mvm02.usace.army.mil
Economist Dr. Ian McDevitt, D.B.A.	901-544- 0755	Ian.McDevitt@usace.army.mil
Project Biologist Thomas E. Inebnit, III	901-544-0817	Thomas.E.Inebnit@us.army.mil
Project Archeologist Dr. Robert A. Dunn	901-544-0706	Robert.A.Dunn@usace.army.mil
Real Estate Official Douglas Young	901-544- 3154	Douglas.B.Young@mvm02.usace.army.mil
Real Estate Official Ronald Alexander	901-544-4275	Ronald.D.Alexander@us.army.mil
Contracting Official Judy E. Stallion	901-544-0776	Judy.E.Stallion@usace.army.mil

APPENDIX 2
PROJECT FACT SHEET

FACT SHEET
INVESTIGATIONS

STUDY NAME AND STATE: White River Basin Comprehensive, AR & MO (White River Basin Comprehensive Study, AR & MO)

AUTHORIZATION: Section 729, WRDA 1986; Section 202, WRDA 2000; Section 2010, WRDA 2007

SUMMARIZED FINANCIAL DATA:	**FY 2009**
Estimated Federal Cost	$ 6,450,000
Estimated Non-Federal Cost	2,150,000
Total Estimated Study Cost	$ 8,600,000
Allocation thru FY 2008	$ 2,902,000
Allocation for FY 2009	$ 215,000
President's Budget for FY 2010	0
Balance to Complete After FY 2010	$ 3,333,000
Amount That Could Be Used in FY 2010	$ 700,000

LOCATION AND DESCRIPTION: The White River Basin comprises approximately 28,000 square miles in northeastern Arkansas and southern Missouri. The purpose of the study is to develop a comprehensive watershed plan for the White River Basin. The plan will serve as a framework for the environmentally sustainable development of water resources within the White River Basin. The problems and potential solutions will be examined in a comprehensive manner, due to the interrelationships of the problems and potential solutions to all of the significant resources in the basin. The study will identify water resources needs and opportunities. Potential study outputs address water resources needs for water supply, flood control, waste water management, navigation, recreation, power generation, and other water resources related needs identified in the comprehensive study. The basin contains five large multi-purpose reservoirs and one reservoir primarily for flood control; over 150 miles of flood control levees along the White River and its tributaries; 2 major national wildlife refuges; and the largest remaining concentration of seasonally flooded bottomland hardwoods in the Mississippi Valley.

ACTIVITIES FOR FY 2009: Carryover funds are being used to initiate Phase II of the Recreation Study (AR), continue the Hydraulic & Sedimentation Study within the upper Cache River Basin (AR), initiate the Ecological Sustainable Water Management (ESWM) Process (AR) and continue the unsteady flow model (MO/AR). The Water Quality Monitoring in the Upper White River Basin (MO) was completed. The Feasibility Cost Share Agreement was amended April 6, 2009 to reflect new cost share requirements as a result of WRDA 2007. An interagency meeting was held April 14-15, 2009.

APPLICATION OF THE AMOUNT THAT COULD BE USED IN FY 2010: Funds in the amount of $700,000 could be used to fully fund a contract to analyze the impacts of hydrologic changes on vegetation communities of the White River Basin in Arkansas (the King Study).

ISSUES AND OTHER INFORMATION: An FCSA was signed on May 22, 2002, with the Arkansas Natural Resources Commission, Arkansas Game and Fish Commission, Arkansas Natural Heritage Commission, Arkansas Waterways Commission, Missouri Department of Conservation, Missouri Department of Natural Resources, and the Arkansas Chapter of The Nature Conservancy. WRDA 2007 modified the non-Federal cost sharing requirements from 50% Federal / 50% non-Federal to 75% Federal / 25% non-Federal. Amendment No. 1 to the above FCSA was signed on April 6, 2009 and reflects the new cost sharing requirements.

ADMINISTRATION POSITION: Support.

CONGRESSIONAL INTEREST: House: **Berry** (AR-1), **Snyder** (AR-2), **Ross** (AR-4), **Emerson** (MO-8); Senate: Lincoln and Pryor (AR); Bond and Talent (MO).

APPENDIX 3
PROJECT COST ESTIMATE WORKSHEET

8-Oct-2008

Federal/Non-Federal Allocation of Funds

White River Comprehensive Study, Arkansas and Missouri

(Fully Funded Estimate)

Fiscal Year	Total	Non-Fed Work-in-Kind	Non-Fed Cash	Federal Cash	Activity
PRIOR	$159,753.05	$0.00	$0.00	$159,753.05	Reconnaissance
PRIOR	$4,236,549.45	$1,073,787.00	$560,515.50	$2,602,693.90	Feasibility
2008	$240,000.00	$0.00	$100,000.00	$140,000.00	Feasibility
2009	TBD	TBD	TBD	TBD	
TOTAL	$4,636,302.50	$1,073,787.00	$660,515.50	$2,902,446.95	

Total Study Cost	$8,548,100.00
Federal (75%)	$6,411,075.00
Non-Federal (25%)	$2,137,025.00
Cash Requirements	$660,515.50
Work-in-Kind Requirements	$1,476,509.50

Allocations To Date	
Federal	$2,902,446.95
Non-Federal	$1,734,302.50
Cash	$660,515.50
State of Missouri	$427,615.50
State of Arkansas	$232,900.00
Work-in-Kind	$1,073,787.00

Remaining Requirements	
Federal	$3,508,628.05
Non-Federal	$402,722.50

CEMVM-PM-P JM 6/03 3 Jun 03

MEMORANDUM FOR CEMVM-PM-B

SUBJECT: Cost Estimate, General Investigations, *White River Comprehensive Study*; Effective 1 Oct 03

Subject cost estimate is forwarded for approval. This cost estimate has been prepared in accordance with applicable regulations and MVD guidance and is within statutory limits.

Encl

Timothy H. Flinn
Project Manager

CEMVM-PM-B Date: 6 JUN 03

MEMORANDUM FOR CEMVM-PM

Subject cost estimate is forwarded for approval.

Encl

JAMES A. REEDER
Acting Chief, Programs Management Branch

CEMVM-PM Date: 6/13/03

MEMORANDUM FOR CEMVD-PM-D

Subject cost estimate is approved. Information copies are enclosed.

FOR THE COMMANDER:

Encl (3 cys)

EDWARD E. BELK
Deputy for Project Management

Fully Funded
STUDY COST ESTIMATE (PB-6)
($000)
Effective : 01 October 03

Appropriation Title:
Category:
Class:
Subclass:

Name of Study: White River Comprehensive Study
PWI No.: 010641
Division:
District:

Date Prepared: 12 May 2003

FEATURE 21- RECONNAISSANCE				FEATURE 22- FEASIBILITY									
Sub-Fea (a)	Title (b)	Recon Phase (c)	Cumulative Actual Recon Cost thru 30 Sep 02 (d)	Sub-Fea (e)	Title (f)	Federal Feasibility Phase (g)	Non-Federal Feasibility Phase (h)	Total Feasibility Phase (I)	Cumulative Actual Feasibility Cost thru 30 Sep 02 (Federal) (j)	Cumulative Actual Feasibility Cost thru 30 Sep 02 (Non-Federal) (k)	Previous Approved Federal Cost Estimate (l)	Previous Approved Non-Fed Cost Estimate (m)	Remarks (n)
A-	Public Involvement	0	0	A	Public Involvement	52.8	52.8	105.6			52.8	52.8	
B-	Institutional Studies	0	0	B-	Institutional Studies	0	0	0					
C-	Social Studies	0	0	C-	Social Studies	75	215	290			75	215	
D-	Cultural Resource Studies	0	0	D-	Cultural Resource Studies	0	0	0					
E-	Environmental Studies Except F&W and HTRW	0	0	E-	Environmental Studies Except F&W and HTRW	1236.5	1081	2317.5	102.1	16.6	1236.5	1081	
F-	Fish & Wildlife Planning Aid Studies	0	0	F-	Fish & Wildlife Planning Aid Studies	439.5	455	894.5			439.5	455	
G-	Economic Studies	0	0	G-	Economic Studies	40.5	40.5	81	0.9		40.5	40.5	
H-	Real Estate Analyses/Documents	0	0	H-	Real Estate Analyses/Documents	0	0	0	0	0			
H1-	Real Estate Section/Report	0	0	H1-	Real Estate Supplement/Report	0	0	0					
H2-	Rights of Entry	0	0	H2-	Gross Appraisal/Report	0	0	0					
H3-	All Other Real Estate Analyses/Documents	0	0	H3-	Preliminary Real Estate Acquistion Maps	0	0	0					
H4-		0	0	H4-	Physical Takings Analysis	0	0	0					
H5-		0	0	H5-	Preliminary Attorneys Opinion of Compensability	0	0	0					
H6-		0	0	H6-	Rights of Entry	0	0	0					
H7-		0	0	H7-	All Other Real Estate Analyses/Documents	0	0	0					
J-	Hydrology & Hydraulics Studies	0	0	J-	Hydrology & Hydraulics Studies	452.5	452.5	905	25.3		452.5	452.5	
K-	Geotechnical Studies	0	0	K-	Geotechnical Studies	0	0	0					
L-	HTRW Assessments	0	0	L-	HTRW Assessments	0	0	0					
M-	All Other Studies/Investigations (Specify)	0	0	M-	All Other Studies/Investigations (Specify)	1127	1127	2254	0	0	1127	1127	
M1-	Recreation Studies	0	0	M1-	Recreation Studies	40	210	250			40	210	
M2-	Water Quality Studies	0	0	M2-	Water Quality Studies	1087	917	2004			1087	917	
M3-	Marsh Value Analysis	0	0	M3-	Marsh Value Analysis	0	0	0					
M4-		0	0	M4-	Review Support			0					
M5-			0	M5-				0					
N-	Surveys & Mapping Except for Real Estate Purposes	0	0	N-	Surveys & Mapping Except for Real Estate Purposes	100	100	200	75		100	100	
P-	Engr. Analysis & Design/Project Cost Estimates	0	0	P-	Engr. Analysis & Design/Project Cost Estimates			0					
Q-	Recon Management	0	0	Q-	Feasibility Management	202.7	202.7	405.4	27.4	2.1	202.7	202.7	
R-	Plan Formulation & Evaluation	115	115	R-	Plan Formulation & Evaluation	171.4	171.4	342.8	12.6		171.4	171.4	
S-	Recon Report Preparation	20	20	S-	Feasibility Report Preparation	199.5	199.5	399	0	0	71.5	71.5	Format corrected; No change to Total
S1-	PSP Preparation	5	5	S1-	PMP Preparation	66	66	132			66	66	Report Preparation.
S2-	Recon Report Preparation	15	15	S2-	Feasibility Report Preparation	133.5	133.5	267			62	62	
T-	Recon Programs & Project Management	0	0	T-	Feasibility Programs & Project Management	196.6	196.6	393.2			196.6	196.6	
V-	Feasibility Study Cost Sharing Agreement (FCSA)	25	25	V-	Initial Draft Project Cooperation Agreement (PCA)	0	0	0					
W-				W-	Feasibility AE Contract Activities	0	0	0					
				X-	Feasibility Damages Assessed AE Contractors	0	0	0					
				Y-	Washington Level Review	6	6	12			6	6	
	Subtotal	160	160		Subtotal	4300	4300	8600	243.3	18.7	4300	4300	
	Contingencies	0	0		Contingencies	0	0	0					
	TOTAL	160	160		TOTAL	4300	4300	8600	243.3	18.7	4300	4300	

Study Authorization and Cost History

Name of Study: White River Basin Comprehensive Study, AR & MO; PWI 010641

Authorization: WRDA 86, Section 729; WRDA 2000 established the cost sharing of Section 729 studies at 50 % Federal/50% non-Federal, half of which can be in-kind services and increased the authorization ceiling from $5,000,000 to $15,000,000.

Cost History (Cost Estimate Revisions and Updates:

Date	Estimated Cost	Remarks
7 Feb 00	$2,670,000	1 Oct 99 PL Recon $0 Feas. $2,670,000 Estimated cost presented to Congress in FY01 President's Budget
3 Apr 01	$4,000,000	1 Oct 00 PL Recon $0 Feas. $4,000,000 (+$1,330,000) Estimated cost as presented to Congress in FY02 President's Budget
18 Dec 01	$8,600,000	1 Oct 01 PL Recon $0 Feas. $8,600,000 (+$4,600,000) PB-6 estimate--Reflects detailed project study plan computation
9 May 02	$8,755,000	1 Oct 02 PL Recon $155,000 (+$155,000) Feas. $8,600,000 PB-6 estimate. Initial $155,000 determined to be reconnaissance phase activities.
12 May 03	$8,760,000	1 Oct 03 PL Recon $155,000 (+$5,000) Feas. $8,600,000 PB-6 estimate. Actual cost of reconnaissance phase activities is $160,000.

APPENDIX 4
RISK INFORMATION

APPENDIX 4
RISK INFORMATION

Example Risk Information Sheets, with instructions, precede the project specific Risk Information Sheets. The project specific Risk Information Sheets document identified risks, descriptions, causes, WBS impacts, and project objectives impact, risk owner and responsibility, agreed response, and expected result of response.

Risk Information Sheet

<table>
<tr><td>ID:</td><td colspan="2">Date Identified:</td></tr>
<tr><td>WBS Item:</td><td colspan="2" rowspan="4">Risk Statement:
[This is a simple statement of what the risk is. Examples:
❑ New technology is being used for some aspect of the project, what is the risk associated with the technology failing or not working as expected?
❑ On a horizontal construction project such as steam or sewer lines, there's a risk of running into unidentified underground utilities. What are the implications?
❑ A barracks renovation is timed for completion to support a currently deployed battalion. There's no place else to house the troops on-post if the schedule slips. What are the implications?
❑ On a lock project, there's a risk of the cofferdam being overtopped. What are the risk(s) and implications?]</td></tr>
<tr><td>Severity:</td></tr>
<tr><td>Probability:</td></tr>
<tr><td>Originator:
[Who identified it?]</td></tr>
<tr><td>Owner:
[Who is responsible for managing the risk?]</td><td colspan="2"></td></tr>
<tr><td colspan="3">Context:
[What's the background for this? How did we get to this point?]</td></tr>
<tr><td colspan="3">Trigger:[What will trigger this risk?]</td></tr>
<tr><td colspan="3">Risk Response: Accept? Avoid? Mitigate?
❑ ACCEPT
[If we accept the risk, do we need a contingency plan or some other response? If we accept, is the customer ready to get additional funds or delay schedule or other response, if that's appropriate?
❑ AVOID
[If we can avoid the risk, describe how we avoided it. Did we eliminate the threat or cause? Choose alternatives?]
❑ MITIGATE
[If we mitigated, what did we do? Reduce the probability of occurrence of the event? Did we change the approach such as off-loading the risk through insurance or other means? Did we set up an additional amount of management reserve to cover identified eventualities?]</td></tr>
<tr><td colspan="3">Risk Control:
[Will workarounds be required? Corrective actions in mid-stream? Implementation of a contingency plan?]</td></tr>
<tr><td colspan="3">Status:
[Specify the date of last review of this risk and what the PDT did at that point.]</td></tr>
<tr><td colspan="3">Lesson(s) Learned:
[If there is a lesson applicable to other projects, document here and feed back through the Observations/Suggestion process of the PMBP Manual.]</td></tr>
<tr><td>Approved by:
[Approving Official signs off and dates in this block.]</td><td>Closing Date:</td><td>Closing Rationale:</td></tr>
</table>

Risk Approval Levels

Severity	Probability of Occurrence					
	////////////////////	Frequent	Occasional	Likely	Seldom	Unlikely
	Catastrophic	DE		DPM		PgM
	Critical	DE	DPM		PgM	PM
	Marginal	DPM	PgM		PM	
	Negligible	PgM	PM			

Key: DE – District Engineer
DPM – Deputy District Engineer (PM)
PgM – Program Manager
PM – Project Manager

[Based on the likelihood that an event will occur, use descriptions below to assess probabilities and severities.]

Probability of Occurrence	*Description*
Frequent	*Occurs often, continuously experienced.*
Occasional	*Occurs several times.*
Likely	*Occurs sporadically.*
Seldom	*Unlikely, but could occur at some time.*
Unlikely	*Can assume it will not occur.*

[Severity – Select based on degree of injury, property damage, or other project risk factors including degree of impact on the cost, schedule, scope, and quality requirements as described below.]

	Negligible	*Marginal*	*Critical*	*Catastrophic*
Health and Safety	*First aid or minor medical treatment*	*Minor injury, lost workday accident*	*Permanent partial disability, temp. total disability > three months*	*Death or permanent total disability*
Cost	*Insignificant cost increase*	*5-10% cost increased*	*10-20% cost increase*	*> 20% cost increase*
Schedule	*Insignificant schedule slippage*	*5-10% schedule slippage*	*10-20% schedule slippage*	*> 20% Overall Project schedule slippage*
Scope	*Scope change barely noticeable*	*Minor areas of scope are affected*	*Scope change unacceptable to customer*	*Project end item is effectively useless*
Quality	*Quality degradation barely noticeable*	*Quality reduction requires customer approval*	*Quality reduction unacceptable to customer*	*Project end item is effectively unusable*

Risk Information Sheet

ID:	**Date Identified**: 21 August 2009	
WBS Item:	**Risk Statement**:	
Severity: *Marginal*	There is a risk that a Project Alternative would require change in the Water levels. This would affect the Water Management Plan for the White River Basin Reservoirs.	
Probability: *Likely*		
Originator: *Berretta*		
Owner: *SWL (LittleRock District)*		

Context:
Six Reservoirs are operated following a complex water control plan with seasonal variations.

Trigger:
Alternatives that require any change.

Risk Response: Accept? Avoid? Mitigate?

[X] ACCEPT
Establish Open Communications with SWL.

- ☐ AVOID

- ☐ MITIGATE

Risk Control:
Communication with all stakeholders throughout the study.

Status:
New

Lesson(s) Learned:
N/A

Approved by:	**Closing Date**:	**Closing Rationale**:
James W. Lloyd, P.E. *Program Manager*		

Risk Information Sheet

ID:	**Date Identified**: 21 August 2009	
WBS Item:	**Risk Statement**:	
Severity: *Marginal*	Other projects, such as Grand Prairie, Bayou Meto, White River Navigation Study will impact the navigable channel of the White River if they are constructed.	
Probability: *Occasional*		
Originator: *Lin*		
Owner:		
Context: Some projects will divert the flow of water out of the White River and may have an impact.		
Trigger: Shortage of flow in the channel.		
Risk Response: Accept? Avoid? Mitigate? [X] ACCEPT Establish a Comprehensive Study ❑ AVOID ❑ MITIGATE		
Risk Control: Assess flow conditions based on different project scenarios.		
Status: New		
Lesson(s) Learned: N/A		
Approved by: *James W. Lloyd, P.E.* *Program Manager*	**Closing Date**:	**Closing Rationale**:

Risk Information Sheet

ID:	**Date Identified**: 21 August 2009	
WBS Item: **Severity**: *Marginal* **Probability**: *Likely* **Originator**: *Allmon* **Owner**: *Project Management/ Congress*	**Risk Statement**: There is a risk that the project will be fiscally funded at a rate such that the study cannot be completed in a timely manner. If funding is received at an appropriate rate, the study can be completed by 2016.	
Context: This project has historically been underfunded by Congress.		
Trigger: The President's Budget		
Risk Response: Accept? Avoid? Mitigate? ❑ ACCEPT [X] AVOID If the sponsors convince Congress to provide timely project funding, then we could meet the schedule date of 2016. ❑ MITIGATE		
Risk Control: Communicate funding availability each year, and execute accordingly.		
Status: New		
Lesson(s) Learned: N/A		
Approved by: *James W. Lloyd, P.E.* *Program Manager*	**Closing Date**:	**Closing Rationale**:

Risk Information Sheet

ID:	**Date Identified**: 21 August 2009	
WBS Item:	**Risk Statement**:	
Severity: *Marginal*	There is a risk that work by others will impact the schedule. Much of the study work is being performed by other government agencies, other Corps Districts, Sponsors, and A-E contractors.	
Probability: *Seldom*		
Originator: *Allmon*		
Owner: *Project Management/ Congress*		
Context: In scheduling other organizations to perform work for the project, it is always a possibility that they will not be able to meet your delivery schedule.		
Trigger: N/A		
Risk Response: Accept? Avoid? Mitigate? ❑ ACCEPT ❑ AVOID [X] MITIGATE Coordinate closely with outside delivery organizations.		
Risk Control: Consider performing more work in-house.		
Status: New		
Lesson(s) Learned: N/A		
Approved by: *Clyde Hunt* *Project Manager*	**Closing Date**:	**Closing Rationale**:

Risk Information Sheet

ID:	**Date Identified**: 21 August 2009	
WBS Item: **Severity**: *Marginal* **Probability**: *occasional* **Originator**: *McDevitt* **Owner**: *PM-E*	**Risk Statement**: There is a risk that there will be new requirements in analyses procedures and associated costs. There could be change in scope and of economic analyses: National Economic Development [NED], Regional Economic Development [RED] and Other Social Effects [OSE].	
Context: Required scope / level of socioeconomic analysis		
Trigger: socioeconomic analysis		
Risk Response: Accept? Avoid? Mitigate? **X** ACCEPT ❑ AVOID ❑ MITIGATE		
Risk Control:		
Status: New		
Lesson(s) Learned:		
Approved by: *James W. Lloyd, P.E.* *Program Manager*	**Closing Date**:	**Closing Rationale**:

Risk Information Sheet

ID:	**Date Identified**: 21 August 2009	
WBS Item: **Severity**: *Marginal* **Probability**: *Occasional* **Originator**: *McDevitt* **Owner**: *PM-E*	**Risk Statement**: There is a risk that there will be new requirements in analyses procedures and associated costs: Software costs for Risk analysis, RED analysis and OSE analysis.	
Context: Software required for respective analysis		
Trigger: Project study		
Risk Response: Accept? Avoid? Mitigate? [X] ACCEPT ❑ AVOID ❑ MITIGATE		
Risk Control:		
Status:		
Lesson(s) Learned:		
Approved by: *Clyde Hunt* *Project Manager*	**Closing Date**:	**Closing Rationale**:

Risk Information Sheet

ID:	**Date Identified**: 21 August 2009	
WBS Item:	**Risk Statement**:	
Severity: *Marginal*	There is a risk that project alternatives would impact endangered or threatened species and/or their critical habitat.	
Probability: *Likely*		
Originator: *Williams*		
Owner *MVM-PM-E*		
Context: There are several federal and numerous state listed species within the project area.		
Trigger: Alternatives that cause direct or indirect negative impacts to the listed species.		
Risk Response: Accept? Avoid? Mitigate? ❑ ACCEPT [X] AVOID (PM-E will review alternatives and work with USFWS to determine feasible solutions to avoid impacts to listed species. In the event that unavoidable impacts will occur, PM-E will work with USFWS to mitigate impacts.) ❑ MITIGATE		
Risk Control: Communications with PDT and USFWS.		
Status: NEW		
Lesson(s) Learned: Involve USFWS early in the planning process.		
Approved by: *James W. Lloyd, P.E.* *Program Manager*	**Closing Date**:	**Closing Rationale**:

Risk Information Sheet

ID:	**Date Identified**: 21 August 2009	
WBS Item:	**Risk Statement**:	
Severity: *Marginal*	There is a risk that project alternatives would impact cultural resources.	
Probability: *Likely*		
Originator: *Williams*		
Owner *MVM-PM-E*		
Context: There are numerous cultural resources within the project area.		
Trigger: Alternatives that cause direct or indirect negative impacts to cultural resources.		
Risk Response: Accept? Avoid? Mitigate? ❑ ACCEPT [X] AVOID (PM-E will review alternatives and work with PDT to determine feasible solutions to avoid impacts to cultural resources. In the event that unavoidable impacts will occur, PM-E will work with SHPO and federally recognized tribes to mitigate impacts.) ❑ MITIGATE		
Risk Control: Communications with PDT, SHPO, and federally recognized tribes, as appropriate.		
Status: NEW		
Lesson(s) Learned: Potential issues with historical ship wrecks and other cultural sites.		
Approved by: *James W. Lloyd, P.E.* *Program Manager*	**Closing Date**:	**Closing Rationale**:

Risk Information Sheet

ID:	**Date Identified**: 21 August 2009
WBS Item:	**Risk Statement**:
Severity: *Marginal*	There is a risk of potential impacts to Fish and Wildlife Service (FWS) Refuge(s).
Probability: *Likely*	
Originator: *Williams*	
Owner *MVM-PM-E*	

Context:
There are two FWS Refuges within the project area.

Trigger:
If a project alternative has an unavoidable impacts to the FWS Refuge(s).

Risk Response: Accept? Avoid? Mitigate?

- ❑ ACCEPT

[X] AVOID (PM-E will review alternatives and work with USFWS to determine feasible solutions to avoid impacts to refuges. In the event that unavoidable impacts will occur, PM-E will work with USFWS to mitigate impacts.) Note: Any construction activities on refuges will require permit from USFWS.

- ❑ MITIGATE

Risk Control:

Communications with PDT and USFWS.

Status:
NEW

Lesson(s) Learned:
Involve USFWS early in the planning process.

Approved by:	**Closing Date**:	**Closing Rationale**:
James W. Lloyd, P.E. *Program Manager*		

APPENDIX 5
COMMUNICATIONS PLAN

White River Basin Comprehensive Study
COMMUNICATIONS PLAN

PURPOSE: The purpose of this Strategic Communications Plan is to develop a strategy for involving the public while developing the comprehensive study.

GOALS: To keep the general public informed. Ensure stakeholders are involved in the fact finding process and gather information for the study.

OBJECTIVES:

1. Provide accurate information to the public.
2. Develop a process of open communication with all stakeholders.
3. Develop scope of studies that addresses concerns and meet the needs of the sponsors within time and cost limitations.
4. To identify valid concerns during the study process and insure consideration of reasonable alternative.

FORMATION OF INTERAGENCY PLANNING TEAM (IPT)–An interagency team was formed to review potential problems in the basin from their perspective. The IPT is made up of members from both the State of Arkansas and Missouri and other Federal Agencies. The project sponsors, Arkansas Game and Fish Commission, Arkansas Soil and Water Conservation Commission, and Missouri Department of Natural Resources are also members of the IPT. The IPT will provide valuable input as well as possible in-kind services to the study.

IDENTIFICATION OF COALITION PARTNERS/IPT MEMBERS:

Arkansas Game and Fish Commission
Arkansas Soil and Water Conservation Commission
Missouri Department of Natural Resources
U.S. Fish and Wildlife Service
U.S. Geological Survey
The Nature Conservancy
Arkansas Department of Natural Heritage
Arkansas Department of Parks and Tourism
U.S. Department of Energy, Southwest Power Administration
U.S. Environmental Protection Agency
Arkansas Waterways Commission
Arkansas Department of Environmental Quality
U.S. Department of Agriculture, Natural Resources Conservation Service
Missouri Department of Conservation

IDENTIFICATION OF PUBLIC/STAKEHOLDERS:

Flood control beneficiaries (cities, towns, communities along the river)
Water supply customers
Ag water supply interests
Farmers
Duck hunters
National environmental organizations
Local environmental organizations
Interested citizens
Environmentalists
Hunting and fishing related businesses
Power generation customers
Navigation
Lake recreation
Other recreation interest

FEDERALLY RECOGNIZED INDIAN TRIBES

Cherokee Nation (Oklahoma)
Osage Tribal Council
Tunica-Biloxi Indians of Louisiana
Quapaw Tribal Business Committee

STRATEGY:

The study will focus on identifying the water resource problems and opportunities. While possible solutions will be identified, all implementation studies and optimization will likely be conducted through subsequent efforts including continuing authorities, existing authority for other projects, or as specifically authorized studies resulting from the comprehensive study. No environmental assessment or environmental impact statement will be conducted as part of the comprehensive study, unless a particular component is carried through plan formulation and a selected plan is recommended.

The following are communication channels that will be utilized to reach our target audience:

1. **WEB PAGE -** Create a web page to update and provide current information to anyone interested in the developments of the study. The web site will allow the general public to be placed on an e-mail list for notification of updates or new developments. They can also submit comments or questions to the Corps.

2. **MAGAZINE ARTICLES -** Magazine articles will be developed occasionally when the study reveals information that may affect the general public or to inform a group or organization, such as Ducks Unlimited or the Arkansas Game and Fish Commission. The Corps may participate in writing magazine articles to identify a project sponsor, and to place the basin- wide study in a positive light.

3. **PRESENTATIONS TO INTEREST GROUPS -** Presentations may be given to interest groups to further clarify the study when questions arise and provide additional opportunity for public input. In addition, cities and towns along the river will be contacted and Corps personnel will offer to meet with officials. The Corps will announce that we are willing to hold these presentations in our kickoff newsletter.

4. **NEWSLETTER -** An initial newsletter will be published to announce the study. The newsletter will outline the goals and objectives of the study and allow the public to provide comments early in the study process. Future newsletters may be published when necessary. Other newsletters could be in the form of a fact sheet designed to inform a specific group or organization that request further information.

5. **NEWS RELEASES** - Formal news releases will utilize both SWL and MVM's Public Affairs Office(s) at the initiation of study, at selected study milestones, at completion of draft (or final) document.

6. **PUBLIC MEETINGS** – Formal public meetings will not be scheduled at this time. If situation dictates, public meetings will be scheduled as necessary.

The selection of a particular communications channel is based on the desired objective, the target audience, the cost, how it lends itself to the message being communicated, multiple exposures to messages, the mix of channels being used and the time it would take to implement.

FORMATION OF OVERSIGHT COMMITTEE – Formation of this group was suggested by some on the Grand Prairie Engineering Review Oversight Committee. The project sponsors may chose to form such a group.

APPENDIX 6
PROJECT CLOSEOUT PLAN

The PDT's goal is to achieve financial closeout after substantial completion in accordance with the USACE CCG. The turnover document is the White River Comprehensive Watershed Resources Management Plan.

U.S. Army Corps of Engineers, Memphis District will deliver the turnover document, through the Mississippi Valley Division, to the USACE Headquarters office. Once HQUSACE has approved the Watershed Resources Management Plan, the completed document will be provided to the project sponsors for their use.

A draft ENG Form 3013 is include below:

WORK ORDER/COMPLETION REPORT *(ER 37-2-10, 37-345-10)*

DISTRICT	APPROPRIATION	PROJECT
Memphis (MVM)		White River Comprehensive Study

CLASS OF WORK	ORIGINAL ESTIMATE DATE	ORIGINAL ESTIMATE AMOUNT	DATE WORK IS TO START	ESTIMATED COMPLETION DATE
	8 Oct 2008	$8548100.00	1 Oct 2009	1 Oct 2014

METHOD OF WORK	BASIS FOR ORDER	TYPE OF ESTIMATE	FEATURE AND SUB-FEATURE NR
☒ CONTRACT ☐ HIRED LABOR	☐ JOB ☒ FISCAL YEAR	☐ ORIGINAL ☒ REVISED	

ACCOUNT NUMBER	DESCRIPTION OF WORK	ESTIMATE			ACTUAL		
		TOTAL QUANTITIES	TOTAL COST	UNIT COST	TOTAL QUANTITIES	TOTAL COST	UNIT COST
	Total Study Cost		8,548,100				
	Federal (75%)		6,411,075				
	Non-Federal (25%)		2,137,025				
	Cash Requirement		660,515				
	Work-in-kind Requirement		1,476,509				
	Allocations to date						
	Federal		2,902,447				
	Non-Federal		1,734,302				
	Cash		660,515				
	State of Missouri		427,615				
	State of Arkansas		232,900				
	Work-in-Kind		1,073,787				
	Remaining Requirements						
	Federal		3,508,628				
	Non-Federal		402,722				
	TOTALS		0				

SUBMITTED BY — *(NAME) (ORGANIZATION UNIT) (DATE)*

FUNDS FOR THIS WORK ARE AVAILABLE — *(NAME) (OFFICE OF THE COMPTROLLER) (DATE)*

THIS WORK IS INCLUDED IN THE APPROVED PROGRAM — *(NAME) (BUDGET PROGRAM BRANCH) (DATE)*

APPROVED — *(DISTRICT COMMANDER - US ARMY CORPS OF ENGINEERS) (DATE)*

WORK DESCRIBED ABOVE HAS BEEN COMPLETED — *DATE COMPLETED (NAME) (DATE SIGNED)*

AMOUNTS REPORTED ABOVE AS ACTUAL COSTS ARE REFLECTED IN THE COST ACCOUNTS AS OF THIS DATE — *(NAME) (OFFICE OF THE COMPTROLLER) (DATE)*

ENG FORM 3013-E, Aug 81 EDITION OF 1 FEB 60 MAY BE USED. (Proponent: CERM-FC)

APPENDIX 7
SCHEDULE & COST CHANGE REQUEST (SACCR)

RECORD OF SCHEDULE & COST CHANGE REQUESTS (SACCRs)

Request No.	Date Approved/Rejected	Subject

APPENDIX 8
POTENTIAL SCHEDULE OR METHOD OF EXECUTION CHANGE

APPENDIX 8
POTENTIAL SCHEDULE OR METHOD OF EXECUTION CHANGE

PM/OM COORDINATION PROCESS
FOR
POTENTIAL SCHEDULE OR METHOD OF EXECUTION CHANGES
20 January 2009

1. PM/OM will prepare and provide a one page memo (memo form attached on the next page) to the PMC. The memo will include:
   a. Background on the activity
   b. Justification for the desired change and
   c. Recommendation to PMC (already coordinated with the sponsor)

2. The PMC will review the justification and recommendation for:
   a. Technical soundness and
   b. Impacts on District execution (milestones and/or funds execution)

3. The PMC will concur with the PM/OM recommendation or make an alternative recommendation.

4. The PMC recommendation, with supporting information, will be coordinated with Contracting and Resource Management, and provided to the director over the management activity being considered.

5. The director will review the PMC recommendation and supporting documentation.

   a. If the director concurs with the recommendation, or if the director makes a different recommendation that is **not** expected to impact the district schedule and/or funds execution, the director will send his recommendation back to the PMC and PM/OM for implementation.

   b. If the director concurs with the recommendation, or if the director makes a different recommendation that **is** expected to impact the district schedule and/or funds execution, the PM/OM and the director will provide the recommendation to the DE. The PM/OM will implement the coordinated recommendation with the DE's input/changes.

APPENDIX 8
POTENTIAL SCHEDULE OR METHOD OF EXECUTION CHANGE

Project Name: 50 CHARACTER LIMIT
Project Manager: 50 CHARACTER LIMIT
Date:

Background: 600 CHARACTER LIMIT

Proposed Change: : 600 CHARACTER LIMIT

Justification: : 600 CHARACTER LIMIT

----------Page Break----------

Project Name: 50 CHARACTER LIMIT
Project Manager: 50 CHARACTER LIMIT
Date:

Approved: Yes or No

PMC Remarks: 600 CHARACTER LIMIT

EC:

EC-C:

EC-D:

EC-G:

EC-H:

OD-A:

PM-P

PM-D

PM-E

RE-A

APPENDIX 9
CHANGE MANAGEMENT PLAN

APPENDIX 9
CHANGE MANAGEMENT PLAN

US Army Corps of Engineers	**Enterprise Standard** **ES - 02018** **Project Change Management**	

Table of Contents

1.0 Purpose. This process covers how to manage changes to the project's Project Management Plan (PMP). (Refer to PMP/PgMP Minimum Content - REF 8005G.) This process covers U.S. Army Corps of Engineers (USACE) Change Management Plan (refer to Change Management Plan – REF8009G and USACE Change Management – PROC3010).

2.0 Applicability. This procedure applies to all projects conducted by USACE Regions and Districts.

3.0 References.

ER 5-1-11, U.S. Army Corps of Engineers Business Process

PMP/PgMP Minimum Content - REF 8005G

Change Management Plan – REF8009G

Change Management – PROC3010

ES-QMS140 - Records Management

4.0 Related Procedures.

ES-02001, "Project Management Plan Preparation"

5.0 Definitions.

Customer. Customer as used in this process is any individual or organization for which USACE delivers projects or services to meet specific needs. Customers may be either external or internal to USACE.

Change Management. Change Management is one of the most critical activities undertaken by the PDT. It is the process by which changes in a project are both agreed upon and documented. Approved changes become the basis for adjusting baseline performance measures, and thus impact the performance metrics and quality objectives established for project success. The PDT must reach agreement on all proposed changes, or resolve conflicts per local SOP.

Project Change. A change that occurs where the project would no longer comply with a commitment made in the PMP. This includes changes that affect the scope, cost, schedule, quality expectations, or risks of the project or other project parameters as defined in the PMP, such as Project Delivery Team (PDT) members or resource commitments, risk or communication strategy, etc.

See Glossary for further definitions.

6.0 Responsibilities.

Project Delivery Team (PDT). The PDT is responsible for notifying the Project Manager (PM) as soon as the PDT becomes aware of any potential changes to the project, including changes identified by Resource Providers and especially those changes requested by customers.

Project Manager (PM). The PM is responsible for the overall implementation of project change control requirements, as addressed in this procedure and the Change Management Plan included in the PMP.

Project Review Board (PRB). The PRB is responsible for acting upon change requests referred from Project or Program Managers. The Project Review Board (PRB) Chairman is responsible for assuring changes requiring PRB action are presented at the PRB meeting.

7.0 Procedures.

When change occurs the PDT will determine if the identified change has impacted the project's approved baseline as defined in the approved PMP. The PDT assesses ways to eliminate or minimize impacts to project scope, schedule, key milestones, costs and fiscal execution prior to initiating the Change Management Procedure.

If the Change Management Procedure is required per local business rules, the PDT documents the change being requested with the impact of the proposed change on the project scope,

schedule, key milestones, costs and fiscal execution in addition to any other PDT internal thresholds.

Thresholds (for a definition see Acronyms and Glossary – REF8000G and Change Management Plan – REF8009G) are tools that the PDT and PM can utilize to manage change to individual activities. As an example, a PDT may choose to allow individual members to make some changes to their schedule activities if those changes do not exceed a pre-determined cost or time frame.

PDTs may elect to use the threshold capabilities in P2 for their management purposes. PDTs may however, use other methods to manage change within their team so long as it is in concert with PMBP; requirements of local procedures; and documented in the PMP Change Management Plan. While PDT thresholds may dictate who takes action within the team, the following applies universally if a PCR is required:

Changes which affect a project's scope, schedule, key milestones, costs or fiscal execution require that the PDT prepare a Project Change Request (PCR). The initiator of the PCR and the procedure for coordination of the PCR within the team should be agreed to and documented in the Change Management section of the project's PMP.

7.1 Schedule Change Procedure

PMs are empowered to approve schedule changes which do not affect established key milestones.

Management and oversight of the day-to-day project activities are the responsibility of the PM and the PDT. In order to do this, every project schedule must include key milestones (HQUSACE, MSC and local). "Milestones" by definition are a zero-duration, non-resourced point in time which signals the beginning or the completion of a portion of work. Deletion of key milestones that a PDT feels are inappropriate to their project must be approved during the initial PMP approval.

While the PM is responsible for approval of most schedule changes, the PRB or Corporate Board (CB) if applicable shall approve changes that affect key milestones. The PRB will evaluate the need to forward the proposed change on to the CB for approval. This procedure empowers teams; allows for more timely approval of changes that may impact real time financial interaction between CEFMS and P2; and to focuses PRB/CB attention on key milestones rather than a myriad of day-to-day project activities.

7.2 Cost Change Procedure

PMs are empowered to approve changes to funding requirements within the current year allocation, as documented in the approved Basic 2101, that do not require reprogramming actions or affect out-year funding requirements and do not affect total project costs. These changes from the Basic 2101 (obligation and/or expenditure) are to be reflected in the Current 2101 as they occur. Documentation of these funding changes should be made by the PM utilizing the PCR process.

7.3 Processing PCRs

In cases when change occurs and a PCR is required, to a project which affects scope, schedule, key milestones, costs or fiscal execution, the PDT must submit a PCR and the PM must refer the PCR for PRB action per requirements stated in Sections 7.1 and 7.2. These PCRs should be submitted as soon as the need for change has been identified and the impacts have been evaluated. There is no predetermined schedule for the submittal and approval of PCRs on activities that do not affect milestones. Such activities are subject to update only in accordance with the passage of time, reflecting real time data. However, the schedule should be defined in the project Change Management Plan in the PMP.

PCRs requiring PRB action must be submitted per local procedures to the PRB Chairman in advance of the PRB in order to be addressed at that meeting.

If the PCR is within the PM's authority to approve, electronic notification of the action taken by the PM will be automatically forwarded to the PRB. It is the PM's responsibility to assure that the PCR is within their authority to approve.

If the PCR is recommended for approval by the PM and requires PRB action a copy of the Project Variance Report will be attached to the PCR and forwarded to PRB members.

PCRs submitted after the cut-off date will be considered at the next regularly scheduled PRB. The PRB Chairman may make exceptions to this rule on a case by case basis. For project issues that require immediate attention, the PM may petition the PRB Chairman for permission to call a special PRB to expedite resolution of the change. It will be the PM's responsibility to schedule the special PRB.

If the PCR is approved by the PRB, the PRB Chairman or his/her designee will add the PRB's approval annotation during the PRB and forward it to the PRB, CB, PM, PDT and Project Controls Group (if applicable) for record. The PM is responsible for attaching the PCR as an electronic document to CMI on the PMBP Portal. The Projects' PM or person responsible for scheduling will then make the approved changes to the official P2 project schedule.

If the PCR is rejected, the PRB designee will add the PRB's rejection annotation to the PCR and forward it to the PM, PDT, PRB, CB and Project Controls Group (if applicable) with an explanation why the PCR has been rejected by the PRB. At that time, the PDT should meet and discuss the impacts of the rejection and as appropriate submit a revised PCR in accordance with the PRB's Guidance. If the PCR is sent back for revision or clarification, the PDT will make revisions to the PCR and the PM will review and resubmit the PCR for PRB approval.

If the PCR is referred to the CB, the PRB Chairman or his/her designee will add PRB comments and recommendations to the PCR and forward to the CB. The PRB's comments should include the reason that it is being referred to the CB and any other pertinent information. Upon referral to the CB, the PCR is forwarded to the PM, PDT, PRB and the Project Controls Group indicating CB action is required. At that time the PCR will be forwarded to the PRB and CB with the Variance Report attached.

At the CB meeting, the PCR and Project Variance Report are reviewed. The CB has the option to approve the PCR, return it for revision or clarification, or reject it. If the PCR is approved by the CB, the CB Chairman or his/her designee will add the CB's approval annotation and forward it to the CB for record. The PCR is forwarded to the PM, PDT, PRB and Project Controls Group indicating CB approval. The PM is responsible for attaching the PCR as an electronic document to CMI on the PMBP Portal. The Project Controls Group will then make the approved changes to the official schedule.

If a PCR is returned to the PDT for clarification or revision, the PDT will revise the PCR as appropriate and the PM will review and resubmit the revised PCR for CB action. If a PCR is rejected, the CB Chairman or his/her designee will add the CB's rejection annotation and forward a copy of the PCR to the PM, PDT, PRB, CB and Project Controls Group (if applicable) with a message indicating why the PCR has been rejected by the CB. At that time, the PDT should meet, discuss the impacts of the rejection and incorporate the comments of the CB.

The PM/PDT should determine if changes need to be documented as Lessons Learned. If so, Lessons Learned should be documented at that time (PROC3020).

8.0 Records & Measurements.

All records will be filed in the central project files in accordance with **ES-QMS140, "Records Management."** Required records are listed in the following table; there are no specific measurement requirements associated with this procedure.

Type	Description	Responsible Office	Location	Record Media	Retention	Disposition
R	Completed project change request forms	CB, PRB, PM	LR	E or P	See PMP	See PMP
R	Historical file, all issued versions of affected PMPs	PM, PDT	LR	E or P	See PMP	See PMP
R	Related correspondence and PDT meeting minutes	PM, PDT	LR	E or P	See PMP	See PMP
M	Not Applicable (N/A)	N/A		N/A	N/A	N/A

Description of Terms

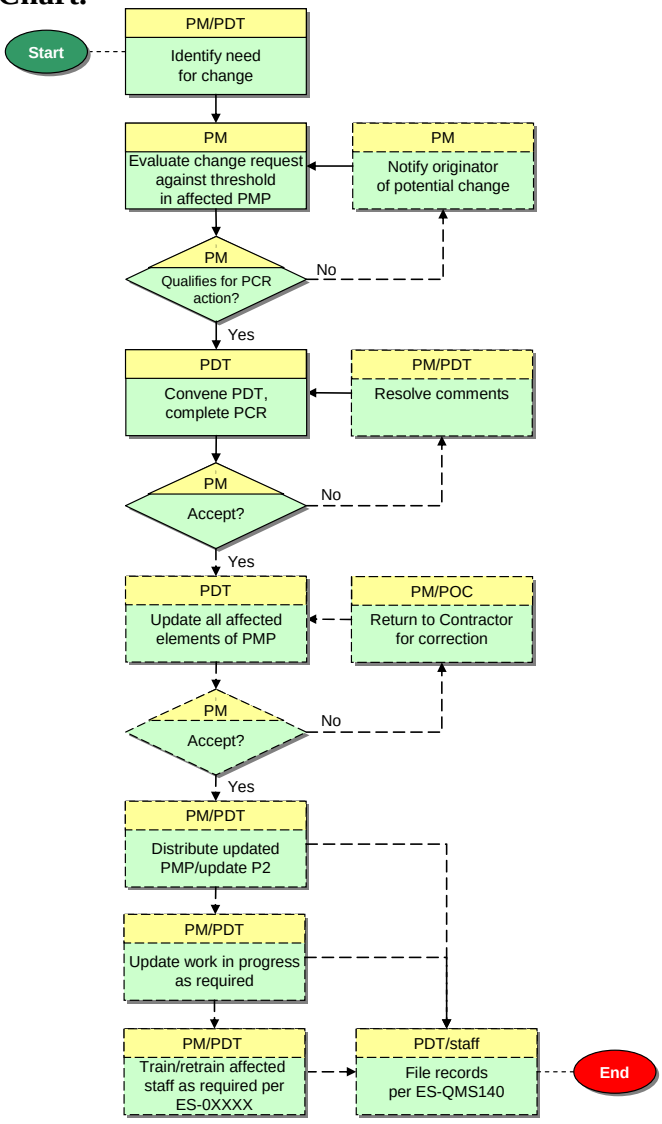
Type:
R Record
M Measurement
LR Local Requirements

Record Media
E Electronic
P Paper

9.0 Attachments.

Attachment A – Project Change Request Form

10.0 Flow Chart.



Attachment A – Project Change Request Form

PCR Format

PCR #

PCR STATUS	
SUBMITTED BY:	
DATE SUBMITTED:	
DATE UPDATED:	
STATUS:	
COMMENTS:	
PROJECT DELIVERY TEAM (PDT)	
PROJECT:	
PROJECT MANAGER:	
PROJECT DESCRIPTION:	
PDT MEMBERS: Construction : Contracting : Engineering : Office of Counsel : Operations : Planning : Program Manager : Public Affairs : Real Estate : Relocations : Resource Management :	
PROPOSED CHANGE	
ACTIVITY NAME & ID#:	
CURRENT START DATE:	
CURRENT FINISH DATE:	
REVISED START DATE:	
REVISED FINISH DATE:	
START VARIANCE:(Calendar days)	
FINISH VARIANCE:(Calendar days)	
JUSTIFICATION FOR CHANGE:	
PREVIOUS SLIP ON THIS TASK?:	
DESCRIPTION OF IMPACTS	
RESOURCES:	
SCOPE:	
SCHEDULE:	

COST:	
QUALITY:	
OTHER:	
KEY DISTRICT MILESTONES	
MILESTONE:	
CURRENT MILESTONE DATE:	
REVISED MILESTONE DATE:	
MILESTONE VARIANCE: (Calendar days)	
OTHER IMPACTS	
ACQUISITION PLAN CHANGE REQUIRED?:	
2101 CHANGE REQUIRED?:	
RISK ASSOCIATED WITH CHANGE:	
PDT RECOMMENDATION	
PDT RECOMMENDATION:	

APPENDIX 9
CHANGE MANAGEMENT PLAN

Project Delivery Team (PDT)

1. Determine if the identified changes or corrective actions have impacted the project's Baseline PMP.

    Resource Providers must notify PDT of changes.

    The PDT should assess ways to minimize impacts on cost, schedule, and quality prior to making changes at threshold levels.

2. Determine if the proposed change exceed the project's PMP thresholds.

    For a definition of threshold, refer to the Acronyms and Glossary – REF8000G and Change Management Plan – REF8009G.

If proposed change exceeds the project's PMP thresholds, goto task #6. Otherwise, goto task #3.

3. Record all changes in P3e.

    Changes below the PMP threshold may be described in P3e using the Issue Log.

4. Determine if changes need to be documented in Lessons Learned.

If documentation needed, stop and complete Lessons Learned – PROC3020. Otherwise, goto task #5.

5. Return to Project Execution and Control – PROC3000.

End of activity.

Project Manager (PM)

6. Create or modify "what if" version of the project in P3e.

    This scenario will reflect the anticipated changes in the proposed revised PMP.

Stop and complete PMP/PgMP Development – PROC2000.

7. Initiate a Change Request Form and submit for approval.

    The Change Request Form serves as the justification and approval document for the proposed change and the revisions to the PMP.

    The Change Request Form should be attached to the project in P3e as a reference document.

For more information on the use of Change Request Form, refer to Change Management Plan – REF8009G.

Stop and complete PMP/PgMP Approval – PROC2070.

Completion of the PMP Approval process will result in an update of the project data, and an adjustment of baseline project metrics for performance measurement.

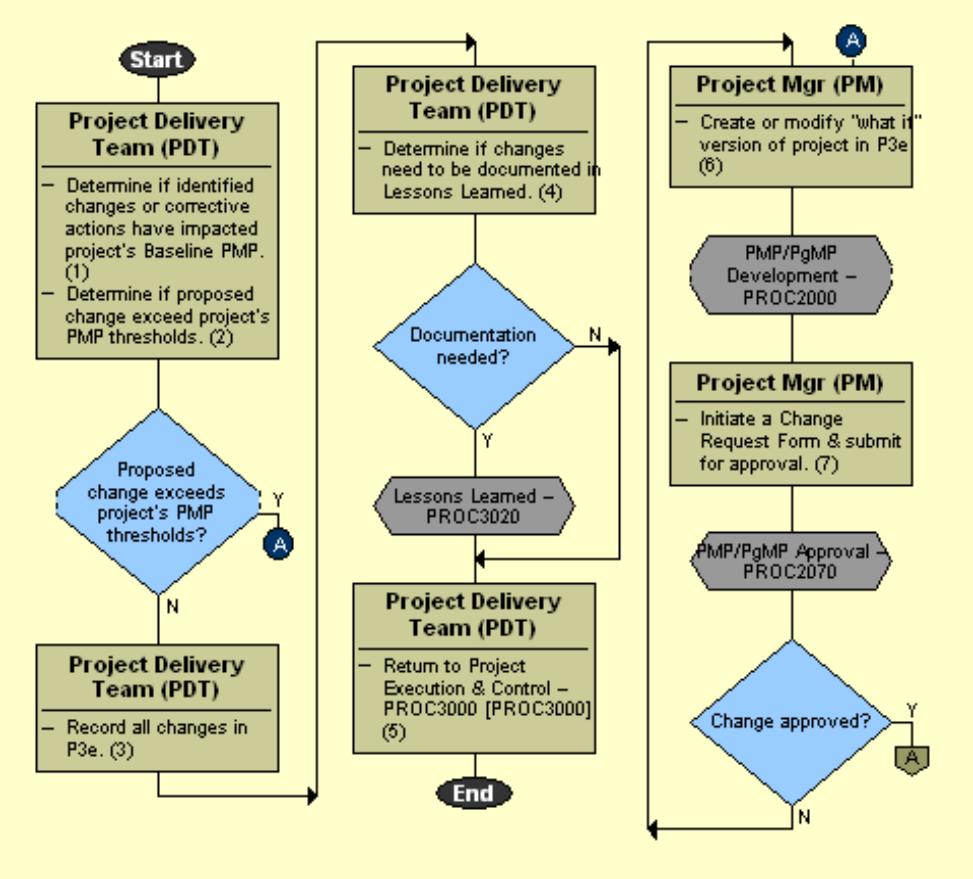
If change approved, goto task #8. Otherwise, goto task #6.

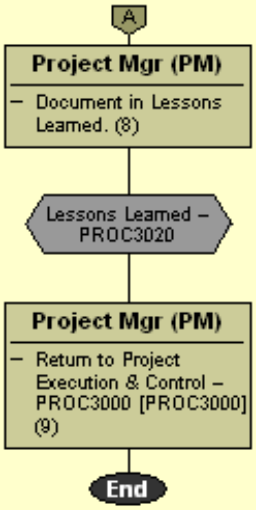
8. Document in Lessons Learned.

Stop and complete Lessons Learned – PROC3020.

9. Return to Project Execution and Control – PROC3000.

End of activity.




A
Project Mgr (PM)
– Document in Lessons Learned. (8)
Lessons Learned – PROC3020
Project Mgr (PM)
– Return to Project Execution & Control – PROC3000 [PROC3000] (9)
End

APPENDIX 10
PMP QA CHECKLIST

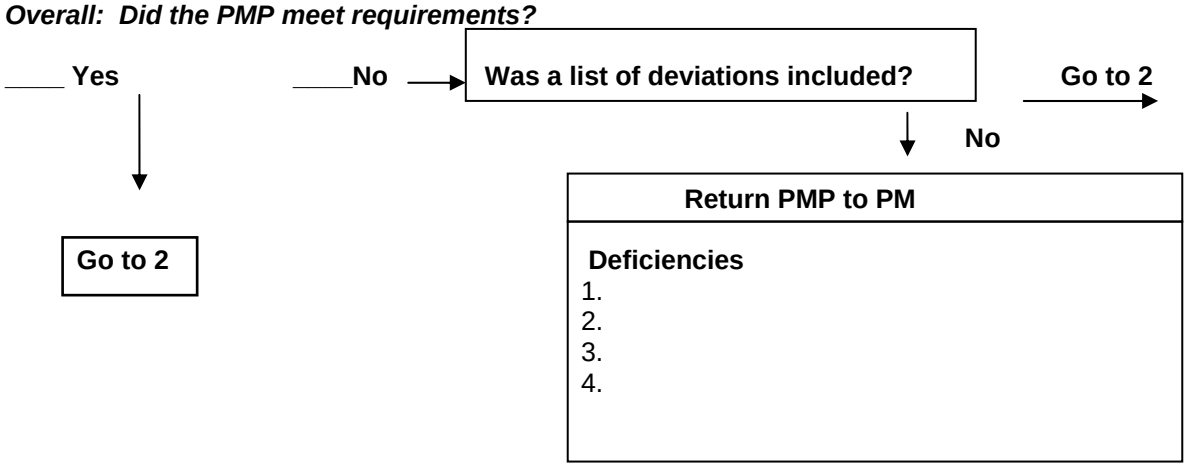
APPENDIX 10
PMP QA CHECKLIST

Civil Works PMP QA Checklist

1. Does the PMP address all elements listed below at a level of detail commensurate with the complexity and size of the project?

Yes	No	PMP Element
___	___	Project Scope
___	___	Project Delivery Team - Roles & Responsibilities
___	___	Project Quality & Safety Expectations
___	___	Internal & External Communication Strategy
___	___	Project Scope Control Strategy
___	___	Acquisition Strategy
___	___	Product QCPs
___	___	Work Breakdown Structure
___	___	Cost
___	___	Financing Strategy - Fed/Non-Fed requirements & funding stream (inc. credits)
___	___	Network Analysis Schedule (inc. PED scheduled for $\leq$ 2 years?)
___	___	Federal/Sponsor Management Plan Agreement
___	___	Critical Assumptions (includes any environmental or other commitments from authorization document that team and PRB must know).
___	___	Change Management
___	___	Project Risk Assessment
___	___	Resources Necessary for Project Success
___	___	Plan for Delivering Project that Meets Expectations, Objectives & Needs
___	___	Approvals

Overall: Did the PMP meet requirements?



2. Did the PMP meet critical HQUSACE performance indicators?

Need to list the performance indicators similar to MIL program.

_____ _____

PMP QA Reviewer Date

APPENDIX 11
FEASIBILITY COST SHARE AGREEMENT

AMENDMENT NO. 1
TO THE
AGREEMENT
BETWEEN THE DEPARTMENT OF THE ARMY
AND
THE STATE OF ARKANSAS
ACTING THROUGH THE ARKANSAS GAME AND FISH COMMISSION, THE
ARKANSAS NATURAL RESOURCES COMMISSION,
THE ARKANSAS NATURAL HERITAGE COMMISSION, AND
THE ARKANSAS WATERWAYS COMMISSION
THE STATE OF MISSOURI
ACTING THROUGH THE MISSOURI DEPARTMENT OF CONSERVATION AND
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES, AND
THE NATURE CONSERVANCY
FOR THE WHITE RIVER BASIN COMPREHENSIVE, AR & MO

THIS AMENDMENT is entered into this 6th day, of April, 2009, by and between the Department of the Army (hereinafter the "Government"), represented by the District Engineer executing this Agreement, and the State of Arkansas acting through the Arkansas Game and Fish Commission, the Arkansas Natural Resources Commission, the Arkansas Natural Heritage Commission, and the Arkansas Waterways Commission, the State of Missouri acting through the Missouri Department of Conservation and the Missouri Department of Natural Resources, and the Nature Conservancy (hereinafter the "Sponsor"),

WITNESSETH, that

WHEREAS, on May 22, 2002, the Government and the non-Federal Sponsor entered into a Feasibility Cost Share Agreement to conduct a study of the White River basin pursuant to Section 729 of the Water Resources Development Act of 1986, Public law 99-662, as amended by Section 202 of the Water Resources Development Act of 2000 (Public Law 106-541); and

WHEREAS, Section 729 of the Water Resources Development Act of 1986 (Public Law 99-662) as amended by Section 202 of the Water Resources Development Act of 2000 (Public Law 106-541) as amended by Section 2010 of the Water Resources Development Act of 2007 (Public Law 110-114) specifies the cost sharing requirements applicable to the Study;

NOW, THEREFORE, the Government and the Sponsor agree to amend the Agreement as follows:

Article II, Paragraph B. shall read as follows:

In accordance with this Article and Article III Paragraphs A, B and C of this Agreement, the Sponsor shall contribute cash and in-kind services equal to twenty-five (25) percent of Study Costs other than excess Study Costs. The Sponsor may, consistent with the applicable law and regulations, contribute through the provision of in-kind services. The in-kind services to be provided by the Sponsor, the estimated negotiated costs for those services, and the estimated schedule under which those services are to be provided are specified in the PSP. Negotiated costs shall be subject to an audit by the Government to determine reasonableness, allocability,

and allowability.

Article II, Paragraph C. shall read as follows:

The Sponsor shall pay a twenty-five (25) percent share of excess Study Costs in accordance with Article III, Paragraph D. of this Agreement.

Article III, Paragraph A. shall read as follows:

The Government shall maintain current records of contributions provided by the parties, current projections of Study Costs, current projections of each party's share of Study Costs, and current projections of the amount of Study Costs that will result in excess Study Costs. At least quarterly, the Government shall provide the Sponsor a report setting forth this information. As of the effective date of this Agreement, estimated Study Costs are $8,548,100 and the Sponsor's share of the estimated Study Costs is $2,137,025. In order to meet the Sponsor's cash payment requirements for its share of estimated Study Costs, the Sponsor must provide a cash contribution or in-kind services currently estimated to be $2,137,025. The dollar amounts set forth in this Article are based upon the Government's best estimates, which reflect the scope of the study described in the PSP, projected costs, price-level changes, and anticipated inflation. Such cost estimates are subject to adjustment by the Government and are not to be construed as the total financial responsibilities of the Government and the Sponsor.

Article III, Paragraph B. shall read as follows:

The Sponsor shall provide its cash contribution or in-kind services required under Article II, Paragraph B. of this Agreement in accordance with the following provisions:

Article III, Paragraph B., subparagraph 1, shall read as follows:

For purposes of budget planning, the Government shall notify the Sponsor by 1 August of each year of the estimated funds or in-kind services that will be required from the Sponsor to meet the Sponsor's share of Study Cost for the upcoming fiscal year.

Article III, Paragraph B., subparagraph 2, shall read as follows:

No later than 30 calendar days prior to the scheduled date for the Government's issuance of the solicitation for the first contract for the Study or for the Government's anticipated first significant in-house expenditure for the Study, the Government shall notify the Sponsor in writing of the funds or in-kind services the Government determines to be required from the Sponsor to meet its required share of Study Costs for the first fiscal year of the Study. No later than 15 calendar days thereafter, the Sponsor shall verify to the satisfaction of the Government that the Sponsor has deposited the required funds in an escrow or other account acceptable to the Government, with interest accruing to the Sponsor.

Article III, Paragraph B, subparagraph 3, shall read as follows:

For the second and subsequent fiscal years of the Study, the Government shall, no later than 60 calendar days prior to the beginning of the fiscal year, notify the Sponsor in writing of the funds or in-kind services the Government determines to be required from the Sponsor to meet its required share of Study Costs for that fiscal year, taking into account any temporary divergences identified under Article II, Paragraph D. of this Agreement. No later than 30 calendar days prior to the beginning of the fiscal year, the Sponsor shall make the full amount of the required funds available to the Government through the funding mechanism specified in paragraph B.2. of this Article.

Article III, Paragraph D. shall read as follows:

The Sponsor shall provide its cash contribution, if required, for excess Study Costs as required under Article II.C of this Agreement by delivering a check payable to "FAO, USAED, Memphis District" to the District Engineer as follows:

IN WITNESS WHEREOF, the parties hereto have executed this Amendment, which shall become effective upon the date it is signed by the District Engineer for the U.S. Army Corps of Engineers, Memphis District.

DEPARTMENT OF THE ARMY

DATE: 6 April 2009

Colonel, Thomas P. Smith
Corps of Engineers
District Engineer
Memphis District

THE STATE OF ARKANSAS

Scott Henderson
Director, Arkansas Game and Fish Commission

DATE: MARCH 26, 2009

Keith Garrison
Director,
Arkansas Waterways Commission

DATE: March 16, 2009

J. Randy Young
Executive Director, Arkansas Natural Resources Commission

DATE: 3-16-9

Karen Smith
Director, Arkansas Natural Heritage Commission

DATE: 3/10/09

THE NATURE CONSERVANCY

Scott Simon, Arkansas State Director
The Nature Conservancy
Arkansas Field Office
DATE: 30 March 2009

THE STATE OF MISSOURI

John D. Hoskins
Director, Missouri
Department of Conservation

DATE: 3-23-09

APPROVED AS TO FORM ONLY

GENERAL COUNSEL

Mark Templeton
Director, Missouri Department
of Natural Resources

DATE: 3-31-09

US Army Corps
of Engineers
Memphis District

White River Basin-Wide Comprehensive Study

A Section 729 of WRDA 1986 Study

Feasibility Cost Share Agreement

May 22, 2002

White River Basin, AR & MO

AGREEMENT
BETWEEN THE DEPARTMENT OF THE ARMY
AND
THE STATE OF ARKANSAS
ACTING THROUGH THE ARKANSAS GAME AND FISH COMMISSION, THE
ARKANSAS SOIL AND WATER CONSERVATION COMMISSION,
THE ARKANSAS NATURAL HERITAGE COMMISSION, AND
THE ARKANSAS WATERWAYS COMMISSION
THE STATE OF MISSOURI
ACTING THROUGH THE MISSOURI DEPARTMENT CONSERVATION AND
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES,
THE NATURE CONSERVANCY, AND
THE NATIONAL WILDLIFE FEDERATION
FOR THE WHITE RIVER BASIN COMPREHENSIVE, AR & MO

THIS AGREEMENT is entered into this 22nd day, of May, 2002, by and between the Department of the Army (hereinafter the "Government"), represented by the District Engineer executing this Agreement, and the State of Arkansas acting through the Arkansas Game And Fish Commission, Arkansas Soil And Water Conservation Commission, the Arkansas Natural Heritage Commission, and the Arkansas Waterways Commission, the State of Missouri acting through the Missouri Department of Conservation and the Missouri Department of Natural Resources, the Nature Conservancy, and the National Wildlife Federation (hereinafter the "Sponsor"),

WITNESSETH, that

WHEREAS, the Congress has authorized the Secretary of the Army to conduct a study of the White River basin pursuant to Section 729 of the Water Resources Development Act of 1986, Public Law 99-662, as amended by Section 202 of the Water Resources Development Act of 2000 (Public Law 106-541);

WHEREAS, Section 729 of the Water Resources Development Act of 1986 (Public Law 99-662) as amended by Section 202 of the Water Resources Development Act of 2000 (Public Law 106-541) specifies the cost sharing requirements applicable to the Study;

WHEREAS, the Sponsor has the authority and capability to furnish the cooperation hereinafter set forth and is willing to participate in study cost sharing and financing in accordance with the terms of this Agreement; and

WHEREAS, the Sponsor and the Government understand that entering into this Agreement in no way obligates either party to implement a project and that whether the Government supports a project authorization and budgets it for implementation depends upon, among other things, the outcome of the Study and whether the proposed solution is consistent with the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies and with the budget priorities of the Administration;

NOW THEREFORE, the parties agree as follows:

ARTICLE I - DEFINITIONS

For the purposes of this Agreement:

A. The term "Study Costs" shall mean all disbursements by the Government pursuant to this Agreement, from Federal appropriations or from funds made available to the Government by the

Sponsor, and all negotiated costs of work performed by the Sponsor pursuant to this Agreement. Study Costs shall include, but not be limited to: labor charges; direct costs; overhead expenses; supervision and administration costs; the costs of participation in Study Management and Coordination in accordance with Article IV of this Agreement; the costs of contracts with third parties, including termination or suspension charges; and any termination or suspension costs (ordinarily defined as those costs necessary to terminate ongoing contracts or obligations and to properly safeguard the work already accomplished) associated with this Agreement.

B. The term "estimated Study Costs" shall mean the estimated cost of performing the Study as of the effective date of this Agreement, as specified in Article III.A. of this Agreement.

C. The term "excess Study Costs" shall mean Study Costs that exceed the estimated Study Costs and that do not result from mutual agreement of the parties, a change in Federal law that increases the cost of the Study, or a change in the scope of the Study requested by the Sponsor.

D. The term "study period" shall mean the time period for conducting the Study, commencing with the release to the U.S. Army Corps of Engineers Memphis District of initial Federal feasibility funds following the execution of this Agreement and ending when the Assistant Secretary of the Army (Civil Works) submits the feasibility report to the Office of Management and Budget (OMB) for review for consistency with the policies and programs of the President.

E. The term "PSP" shall mean the Project Study Plan, which is attached to this Agreement and which shall not be considered binding on either party and is subject to change by the Government, in consultation with the Sponsor.

F. The term "negotiated costs" shall mean the costs of in-kind services to be provided by the Sponsor in accordance with the PSP.

G. The term "fiscal year" shall mean one fiscal year of the Government. The Government fiscal year begins on October 1 and ends on September 30.

ARTICLE II - OBLIGATIONS OF PARTIES

A. The Government, using funds and in-kind services provided by the Sponsor and funds appropriated by the Congress of the United States, shall expeditiously prosecute and complete the Study, in accordance with the provisions of this Agreement and Federal laws, regulations, and policies.

B. In accordance with this Article and Article III.A., III.B. and III.C. of this Agreement, the Sponsor shall contribute cash and in-kind services equal to fifty (50) percent of Study Costs other than excess Study Costs. The Sponsor may, consistent with applicable law and regulations, contribute up to 25 percent of Study Costs through the provision of in-kind services. The in-kind services to be provided by the Sponsor, the estimated negotiated costs for those services, and the estimated schedule under which those services are to be provided are specified in the PSP. Negotiated costs shall be subject to an audit by the Government to determine reasonableness, allocability, and allowability.

C. The Sponsor shall pay a fifty (50) percent share of excess Study Costs in accordance with Article III.D. of this Agreement.

D. The Sponsor understands that the schedule of work may require the Sponsor to provide cash or in-kind services at a rate that may result in the Sponsor temporarily diverging from the

obligations concerning cash and in-kind services specified in paragraph B. of this Article. Such temporary divergences shall be identified in the quarterly reports provided for in Article III.A. of this Agreement and shall not alter the obligations concerning costs and services specified in paragraph B. of this Article or the obligations concerning payment specified in Article III of this Agreement.

E. If, upon the award of any contract or the performance of any in-house work for the Study by the Government or the Sponsor, cumulative financial obligations of the Government and the Sponsor would result in excess Study Costs, the Government and the Sponsor agree to defer award of that and all subsequent contracts, and performance of that and all subsequent in-house work, for the Study until the Government and the Sponsor agree to proceed. Should the Government and the sponsor require time to arrive at a decision, the Agreement will be suspended in accordance with Article X., for a period of not to exceed six months. In the event the Government and the sponsor have not reached an agreement to proceed by the end of their 6 month period, the Agreement may be subject to termination in accordance with Article X.

F. No Federal funds may be used to meet the Sponsor's share of Study Costs unless the Federal granting agency verifies in writing that the expenditure of such funds is expressly authorized by statute.

G. The award and management of any contract with a third party in furtherance of this Agreement which obligates Federal appropriations shall be exclusively within the control of the Government. The award and management of any contract by the Sponsor with a third party in furtherance of this Agreement which obligates funds of the Sponsor and does not obligate Federal appropriations shall be exclusively within the control of the Sponsor, but shall be subject to applicable Federal laws and regulations.

ARTICLE III - METHOD OF PAYMENT

A. The Government shall maintain current records of contributions provided by the parties, current projections of Study Costs, current projections of each party's share of Study Costs, and current projections of the amount of Study Costs that will result in excess Study Costs. At least quarterly, the Government shall provide the Sponsor a report setting forth this information. As of the effective date of this Agreement, estimated Study Costs are $8,548,100 and the Sponsor's share of estimated Study Costs is $4,274,050. In order to meet the Sponsor's cash payment requirements for its share of estimated Study Costs, the Sponsor must provide a cash contribution currently estimated to be $2,137,025. The dollar amounts set forth in this Article are based upon the Government's best estimates, which reflect the scope of the study described in the PSP, projected costs, price-level changes, and anticipated inflation. Such cost estimates are subject to adjustment by the Government and are not to be construed as the total financial responsibilities of the Government and the Sponsor.

B. The Sponsor shall provide its cash contribution required under Article II.B. of this Agreement in accordance with the following provisions:

1. For purposes of budget planning, the Government shall notify the Sponsor by 1 August of each year of the estimated funds that will be required from the Sponsor to meet the Sponsor's share of Study Costs for the upcoming fiscal year.

2. No later than 30calendar days prior to the scheduled date for the Government's issuance of the solicitation for the first contract for the Study or for the Government's anticipated first significant in-house expenditure for the Study, the Government shall notify the Sponsor in

applicable cost principles and regulations. The costs of Government audits shall be included in total Study Costs and shared in accordance with the provisions of this Agreement.

ARTICLE VII - RELATIONSHIP OF PARTIES

The Government and the Sponsor act in independent capacities in the performance of their respective rights and obligations under this Agreement, and neither is to be considered the officer, agent, or employee of the other.

ARTICLE VIII - OFFICIALS NOT TO BENEFIT

No member of or delegate to the Congress, nor any resident commissioner, shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom.

ARTICLE IX - FEDERAL AND STATE LAWS

In the exercise of the Sponsor's rights and obligations under this Agreement, the Sponsor agrees to comply with all applicable Federal and State laws and regulations, including Section 601 of Title VI of the Civil Rights Act of 1964 (Public Law 88-352) and Department of Defense Directive 5500.11 issued pursuant thereto and published in 32 C.F.R. Part 195, as well as Army Regulations 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army".

ARTICLE X - TERMINATION OR SUSPENSION

A. This Agreement shall terminate at the conclusion of the Study Period, and neither the Government nor the Sponsor shall have any further obligations hereunder, except as provided in Article III.C.; provided, that prior to such time and upon thirty (30) days written notice, either party may terminate or suspend this Agreement. In addition, the Government shall terminate this Agreement immediately upon any failure of the parties to agree to extend the study under Article II.E. of this agreement, or upon the failure of the sponsor to fulfill its obligation under Article III. of this Agreement. In the event that either party elects to terminate this Agreement, both parties shall conclude their activities relating to the Study and proceed to a final accounting in accordance with Article III.C. and III.D. of this Agreement. Upon termination of this Agreement, all data and information generated as part of the Study shall be made available to both parties.

B. Any termination of this Agreement shall not relieve the parties of liability for any obligations previously incurred, including the costs of closing out or transferring any existing contracts.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement, which shall become effective upon the date it is signed by the District Engineer for the U.S. Army Corps of Engineers, Memphis District.

DEPARTMENT OF THE ARMY

DATE: 22 May 02

Colonel, Jack V. Scherer
Corps of Engineers
District Engineer
Memphis District

FCSA ++

THE STATE OF ARKANSAS

Hugh C. Durham
Director, Arkansas Game
and Fish Commission

DATE: 5-6-02

* Scott Henderson

J. Randy Young
Executive Director, Arkansas Soil
and Water Conservation Commission

DATE: 5/8/02

Karen Smith
Director, Arkansas Natural
Heritage Commission

DATE: 4/30/02

Keith Garrison
Director,
Arkansas Waterways Commission

DATE: 5/9/02

THE STATE OF MISSOURI

Jerry M. Conley
Director
Missouri Department of Conservation

DATE: 4-1-02

* Mike Smith
John Hoskins
John D. Hoskins

Stephen Mahfood
Director
Missouri Department of Natural Resources

DATE: 4/4/02

* Mike Wells
~~Bob~~ Doyle Childers

THE NATURE CONSERVANCY

Nancy DeLamar, State Director
The Nature Conservancy
Arkansas Field Office

DATE: 5/10/02

MAT
*

NATIONAL WILDLIFE FEDERATION

Susan Kaderka
Director
Gulf States Natural Resources Center
National Wildlife Federation

DATE: _____

APPENDIX 12
REVIEW PLAN

PEER REVIEW PLAN
FOR
WHITE RIVER COMPREHENSIVE BASIN STUDY
MISSOURI AND ARKANSAS

PEER REVIEW PLAN

February 14, 2008

1. General. This review plan was developed in accordance with Engineer Circular (EC) 11052-408, "Peer Review of Decision Documents," dated 31 May 2005. The EC establishes procedures to ensure the quality and credibility of Corps decision documents. It applies to all feasibility studies and reports and any other reports that lead to decision documents that require authorization by Congress. The level of review defined in this plan has been developed and coordinated with Mississippi Valley Division and vertical teaming is ongoing at every level of development.

2. Project Description.

Congress authorized the study of the White River Basin pursuant to Section 729 of the Water Resources Development Act (WRDA) of 1986 (Public Law 99-662), and as amended by Section 202 of the Water Resources Development Act of 2000 (Public Law 106-541). WRDA 2000 established the cost sharing of Section 729 studies at 50 % Federal/50% non-Federal, and half of the non-Federal funds can be in-kind services. WRDA 2007 recently amended the cost sharing of Section 729 studies to 75% Federal/25% non-Federal, and allows for all of the non-Federal funds to be in-kind services. The area of the Basin includes the First, Second, Third, and Fourth Congressional Districts of Arkansas, and the Seventh and Eighth Congressional Districts of Missouri.

The study purpose is to determine if there is a Federal interest in providing solutions to a full spectrum of water resource related problems and opportunities in the White River Basin, such as ecosystem restoration, navigation, flood damage reduction, agricultural and municipal water supply, waste water treatment, aquifer protection, water quality improvement, waterfowl management, and aquatic and wildlife habitat restoration. The primary focus of this study is to determine environmental, ecosystem, and economic options to address this spectrum of problems and opportunities in the basin. The problems and potential solutions will be examined in a comprehensive and holistic manner because of the interrelationships of the problems and potential solutions to all of the significant resources in the basin. It is not anticipated at this time that the study and feasibility report will produce any influential scientific information.

The White River Basin can be categorized into two distinct areas with its own issues and requirements. The upper basin problems are based on rapid population growth and development, which are increasing the amount of municipal and industrial water use and wastewater generated. While increased water needs, increased wastewater discharge, and agricultural uses are contributing to decreased water quality, the capability of the water resources to sustain these loading increases is not known. Studies are needed to determine the effects of the increased runoff on the ecosystem and to determine if the problems will affect the lakes and water based recreation in the future. In the lower basin, much of the previously forested area has been converted to cropland. The Alluvial and Sparta aquifers are being depleted in some areas, in part to increased agricultural demands. The counties suffer from the socio-economic problems common to the Mississippi Delta and some have lost population in recent years. The lower portion of the river is seasonally navigable, but during low flows, shipments must be diverted to other ports or light loaded. Water quantity has become a major concern since flows in the river are controlled and water is being used for a variety of purposes. In contrast to the upper basin,

the primary concerns expressed in the lower basin relate to water quantity, not quality. The wetlands in the lower basin are not only nationally significant, but are also recognized internationally. Studies are necessary to identify the effects that current and future flow regimes could have on wetlands.

The White River Basin comprises approximately 28,000 square miles in northeastern Arkansas and southern Missouri. The basin contains five large multi-purpose reservoirs and one reservoir primarily for flood control; over 150 miles of flood control levees along the White River and its tributaries; 2 major national wildlife refuges; and the largest remaining concentration of seasonally flooded bottomland hardwoods in the Mississippi Valley. The study will identify water resources needs and opportunities. Potential study outputs address water resources needs for water supply, flood control, waste water management, navigation, recreation, power generation, and other water resources related needs identified in the comprehensive study. The comprehensive plan will serve as a framework for the environmentally sustainable development of water resources within the White River Basin.

A Feasibility Cost Sharing Agreement (FCSA) was signed on May 22, 2002, with the following sponsors: Arkansas Game and Fish Commission, Arkansas Natural Heritage Commission, Arkansas Soil and Water Conservation Commission (now Arkansas Natural Resources Commission), Arkansas Waterways Commission, Missouri Department of Conservation, Missouri Department of Natural Resources, and the Arkansas Chapter of The Nature Conservancy. The estimated study costs were $8,548,100 and the sponsor's share of the total estimated cost was $4,274,050 prior to WRDA 2007. The sponsors were to provide a cash contribution estimated to be $2,137,025.

A Project Study Plan (PSP) was developed in October 2001 to describe the study effort and to provide a detailed time and cost estimate for the study. The Memphis District and the sponsors developed the Project Study Plan as a cooperative effort. This Plan contains a Quality Control Plan (QCP), which provides a technical review mechanism to insure that quality products are developed during the course of the study. A Technical Review Team (TRT) was identified in the QCP to be responsible for performing an independent technical review. The TRT members were identified in the PSP from functional areas from within the Memphis District and Little Rock District. The QCP also indicated that the TRT members may be modified as the study progresses to match the review requirements, and may result in the use of additional out-of-house resources. Based on the requirements of the EC, this TRT will not be used to conduct the ITR.

3. Product Delivery Team (PDT). The Memphis District, U.S. Army Corps of Engineers and the sponsors identified above are jointly conducting this study. The entire PDT is presented in Table 1.

FEASIBILITY PHASE PROJECT DELIVERY TEAM

TABLE 1.

Discipline	Name	Office/Agency
Project Manager		CEMVM-PM-P
Program Analyst		CEMVM-PM-P
Environmental Coordinator		CEMVM-PM-E
Environmental Lead		CEMVM-PM-E
Hydraulics & Hydrology Lead		CEMVM-EC-H
Hydraulics & Hydrology		CEMVM-EC-H
Economist		CEMVM-PM-D
Public Affairs Office		CEMVM-PAO
Office of Counsel		CEMVM-OC
Fisheries Biologist		CEERD-EE-A
PCX Director		CEMVD-RB-T
PCX POC		CELRN-PM-P

4. Review and Quality Control.

Independent Technical Review. As per EC 1105-2-408, Independent Technical Review (ITR) is the primary method of quality control. ITR is a critical examination by a qualified person or team that was not involved in the day-to-day technical work that supports the decision document. ITR is intended to confirm that such work was accomplished in accordance with clearly established professional principles, practices, codes, and criteria, and that recommendations are in compliance with laws and policy.

The ITR will be ongoing throughout product development, rather than a cumulative review performed at the end of the investigation. The ITR will be performed by the National Ecosystem Restoration Planning Center of Expertise (PCX), Mississippi Valley Division. This PCX was chosen to conduct the ITR due to the potential environmental and ecosystem impacts resulting from the project study focus. This review plan will be submitted to the PCX Director, and PCX Deputies for approval. The expertise and technical backgrounds of the ITR team members qualify them to provide a comprehensive technical review of the product. If the National PCX is not available to conduct the ITR, then they will select an alternate action engineer district to conduct the ITR. The members participating in the ITR will be selected at the time when the district is identified. The number of reviewers will be selected by the PCX and as a minimum should include the following disciplines and expertise (See Table 2).

TABLE 2 INDEPENDENT TECHNICAL REVIEW TEAM

Discipline	Description	Reviewer
Review Team Leader	Plan Formulation experience on ecosystem restoration projects	TBD
Environmental	Fisheries biologist and/or riparian ecologist with experience on ecosystem	TBD
Cultural Resources	Archaeologist	TBD
Economic Evaluation	Economist with experience on ecosystem restoration projects	TBD
Geomorphology	Geologist or hydraulic engineer with ecosystem restoration project experience	TBD
Civil Design	Civil engineer with experience in designing grading plans, levees (and levee and bank-protection removal or modification), and habitat structures	TBD
Hydraulics and Hydrology	Hydrologist or hydraulic engineer with HEC-RAS unsteady state, floodplain mapping, and ecosystem restoration experience	TBD
Structures	Civil or structural engineer experienced with design and construction of structures related to environmental projects.	TBD

c. ITR comments and responses will be recorded in the online DrChecks system (www.projnet.org). Documentation of the independent technical review will be included with the submission of the reports to Mississippi Valley Division and HQUSACE. All comments resulting from the ITR will be resolved prior to forwarding the feasibility study to higher authority and local interests. The report will be accompanied by a certification, indicating that the independent technical review process has been completed and that all technical issues have been resolved.

d. Quality control will be monitored via internal/District functional element reviews, Local Sponsor reviews, and Higher Authority/vertical team conferences and reviews.

e. The Sponsor will be responsible for quality control over deliverables provided as in-kind contributions. The Corps will verify that such contributions meet negotiated requirements and standards before granting cost-sharing credit for those contributions.

f. **Peer Review Plan**. This basin study is subject to External Peer Review (EPR). The magnitude of the study is large, as it covers a considerable amount of land in Arkansas and Missouri. The study has the potential to be controversial, as the White River evokes emotional reactions concerning the usage and environmental impacts on the river. For these reasons, the External Peer Review as described in Engineering Circular 1105-2-408 will be required in addition to the ITR. It is anticipated that the EPR will be conducted by individual experts in the appropriate fields of study. The PDT, PCX, and interagency team will determine the disciplines or expertise required to conduct the EPR. The EPR reviewers would be selected by the Corps, the authors of the individual work items, or the interagency team. The interagency team should include members from the following organizations:

U.S. Fish and Wildlife Service
The Nature Conservancy of Arkansas
Arkansas Game and Fish Commission
Arkansas Natural Heritage Commission
Arkansas Natural Resources Commission
Arkansas Waterways Commission
Missouri Department of Conservation
Missouri Department of Natural Resources

The PCX will coordinate the EPR review and any decision documents generated as a result of the EPR review with the Mississippi Valley Division (MVD) National Ecosystem Restoration Planning Center of Expertise. It is not anticipated that the public will be asked to nominate individuals to serve as an EPR reviewer. However, any significant public comments will be provided to the EPR reviewers before the review is conducted. The external peer review team will be qualified to review and ensure:

- Scientific data used in the study was accurate and complete
- Modeling methods used were pertinent to the type of study results required, and sound modeling methodology was used
- The analysis contained clearly justified and valid assumptions
- Concepts, features, analytical methods, analyses, and details are appropriate, fully coordinated, and correct
- Problems/issues are properly defined and scoped
- Conclusions and recommendations are reasonable and justified

The alternatives that the team should consider should include potential significant economic, environmental, ecosystem, and social effects, interagency interest, controversial matters, complex basin challenges, and possible changes in practices and/or policy. The number of reviewers will be dependent on the number of work items that comprise the overall study. The disciplines and expertise required for the EPR are presented in Table 3.

TABLE 3. EXTERNAL PEER REVIEW PANEL

Discipline	Description	Reviewer
Plan Formulation	Plan Formulation experience on ecosystem restoration projects	TBD
Environmental	Fisheries biologist and/or riparian ecologist with experience on ecosystem restoration projects	TBD
Economic Evaluation	Economist with experience on ecosystem restoration projects	TBD
Hydraulics and Hydrology	Hydrologist or hydraulic engineer with HEC-RAS unsteady state, floodplain mapping, ecosystem restoration experience	TBD

g. Review.

(1) ITR Team responsibilities are as follows:

(a) Reviewers shall review the draft report to confirm that work was done in accordance with established professional principles, practices, codes, and criteria and for compliance with laws and policy. Comments on the report shall be submitted into DrChecks.

(b) Reviewers shall pay particular attention to one's discipline but may also comment on other aspects as appropriate. Reviewers that do not have any significant comments pertaining to their assigned discipline shall provide a comment stating this.

(c) Grammatical and editorial comments shall not be submitted into DrChecks. Comments should be submitted to ITR manager via electronic mail using tracked changes feature in the Word document or as a hard copy mark-up. The ITR manager shall provide these comments to the Study Manager.

(d) Review comments shall contain these principal elements:

- A clear statement of the concern
- The basis for the concern, such as law, policy, or guidance
- Significance for the concern
- Specific actions needed to resolve the comment
-

(e) The "Critical" comment flag in DrChecks shall not be used unless the comment is discussed with the ITR manager and/or the Study Manager first

(2) PDT Team responsibilities are as follows:

(a) The team shall review comments provided by the ITRT in DrChecks and provide responses to each comment using "*Concur*", "*Non-Concur*", or "*For Information Only*". *Concur* responses shall state what action was taken and provide revised text from the report if applicable. *Non-Concur* responses shall state the basis for the disagreement or clarification of the concern and suggest actions to negotiate the closure of the comment.

(b) Team members shall contact the PDT and ITRT managers to discuss any "non-concur" responses prior to submission.

h. Resolution.

(1) Reviewers shall back check PDT responses to the review comments and either close the comment or attempt to resolve any disagreements. Conference calls shall be used to resolve any conflicting comments and responses.

(2) Reviewers may "agree to disagree" with any comment response and close the comment with a detailed explanation. ITRT members shall keep the ITR manager aware of problematic comments. The vertical team will be informed of any policy variations or other issues that may cause concern during Headquarter review.

i. Certification. To fully document the ITR process, a statement of technical review will be prepared. Certification by the ITR manager and the Study Manager will occur once issues raised by the reviewers have been addressed to the review team's satisfaction. Indication of this concurrence will be documented by the signing of a certification statement (Appendix A). A summary report of all comments and responses will follow the statement and accompany the report throughout the report approval process.

j. Model Certification and Implementation Measures. It is not anticipated at this time that any specific planning or implementation models will be determined from the Peer Review Plan. Therefore, no specific implementation costs will be addressed and coordination with the NWW Cost Estimating Directory of Expertise is not needed.

There are engineering models currently being performed as part of the overall White River Comprehensive Basin Study in an attempt to collect data needed to determine the problems and opportunities in the basin. It is possible that outcomes from the comprehensive report will result in the development of future feasibility reports from the identified problems and opportunities. The following is a list of the engineering models currently ongoing as part of the overall study for the White River Basin:

- Unsteady Flow Model
- Sedimentation Study
- Recreation Study
- Eco-Flows Study
- Fisheries Study
- Forebay Oxygen Diffuser Study

k. Alternative Formulation Briefing (AFB). The AFB for this project will occur after ITR certification. It is possible that the briefing will result in additional technical or policy comments for resolution. After resolution of significant comments, the ITR will be recertified, if needed.

l. The draft feasibility report and environmental assessment will be distributed for public review as part of the normal NEPA review process. The review will be scheduled after the Alternative Formulation Briefing and before submitting the report to the Civil Works Review Board in accordance with the study schedule defined in the Project Management Plan. Public review of this document will begin approximately one month after the completion of the ITR process and policy guidance memo. The period will last 30 days as required by law. A formal State and Agency review will occur concurrently with the public review. However, it is anticipated that intensive coordination with these agencies will have occurred concurrent with

the planning process. Upon completion of the review period, comments will be consolidated in a matrix and addressed, if needed. A comment resolution meeting will take place if needed to decide upon the best resolution of comments. A summary of the comments and resolutions will be included in the document.

5. Schedule. The schedule for study tasks related to review and public input are shown in Table 4. It is meant to be generic in nature due to uncertainties with both Federal and non-Federal funding. Actual dates will be scheduled once the review period draws closer. Currently, it is estimated that review of this document will be begin in the 1st Quarter of FY 2012.

TABLE 4. STUDY TASKS
SCHEDULE

Task	Date
ITR Review and Comments	Oct-Nov 2012
PDT Responses & Backcheck	Dec-Jan 2012
HQ/MVD/Public Review	Feb-Mar 2012
Certification and Transmit to HQ	April 2012
HQUSACE Policy Review	May-Jun 2012
Agency and Public Review	Jul-Aug 2012
Draft Chief's Report	Sep 2012

APPENDIX 13
RECONNAISSANCE REPORT

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
167 NORTH MAIN STREET B-202
MEMPHIS, TENNESSEE 38103-1894

Reply to
Attention of:

CEMVM-PM-P (1105-2-10c) 9 August 2001

MEMORANDUM THRU COMMANDER, MISSISSIPPI VALLEY DIVISION, ATTN: CEMVD-MD-PM

FOR COMMANDER, U.S. ARMY CORPS OF ENGINEERS, ATTN: CECW-BC

SUBJECT: 905(b) Analysis for the White River Comprehensive Study and the Draft Cost Share Agreement

1. Attached for your review and approval is the 905(b) analysis for the White River Comprehensive Study, authorized by Section 729 of WRDA 1986. This is required by a memorandum dated 29 May 01, subject: Implementation Guidance for Section 202 of the Water Resources Development Act (WRDA) 2000, Watershed and River Basin Assessments, which Amends Section 729, WRDA 86, Study of Water Resources Needs of River Basins and Regions.

2. Also attached is the draft cost share agreement for your approval.

3. Recommend that the White River Basin Comprehensive Study proceed to the feasibility phase. Further, I recommend that the draft cost sharing agreement submitted with this 905(b) analysis be approved and study funds be provided as soon as possible

4. If you have questions, contact, Jim Bodron, Project Manager, at (901) 544-3639 or e-mail James.A.Bodron@mvm02.usace.army.mil.

2 Encls
(4 cys - CECW-AR)
(4 cys - CEMVD-PM-E)

Jack V. Scherer
Colonel, Corps of Engineers
Commanding

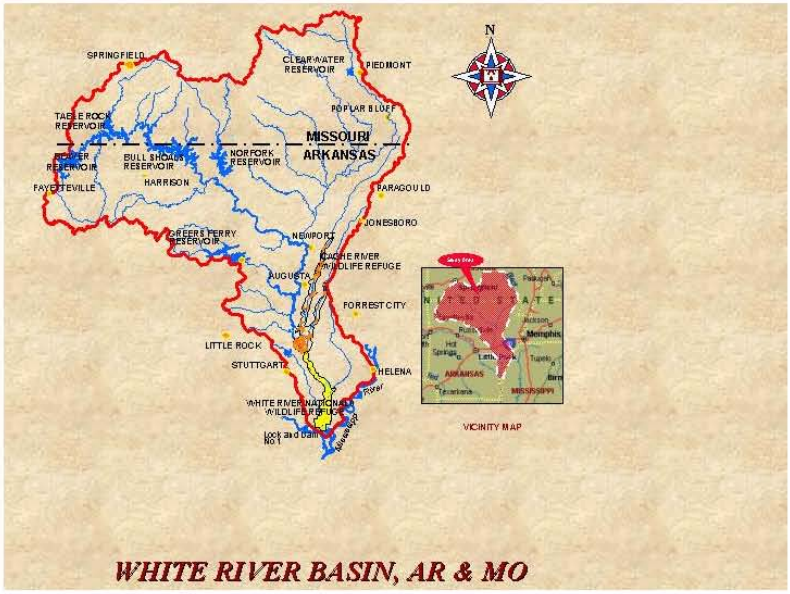
US Army Corps
of Engineers
Memphis District

WHITE RIVER BASIN COMPREHENSIVE STUDY

A Section 729 of WRDA 1986 Study

905(b) Analysis

September 2001



The 905b Analyses, an expedited reconnaissance report, for the White River Comprehensive Study appears to have been prepared in accordance with applicable policy and regulation including ER1105-2-100.

Ken G. Williams
Chief
Project Management Branch

7/30/01
Date

Billy D. Gibson
Chief
Acquisition Branch

7/31/01
Date

Edward E. Belk
Assistant Chief
Planning, Programs, and Project
Management Division

7/30/01
Date

Dewey L. Jones
Chief
Hydraulics Branch

7-31-01
Date

David L. Reece
Chief
Environmental and
Economic Analysis Branch

7/31/01
Date

Hubert H. Logan
Chief
Civil Design Branch

8/3/01
Date

The 905b Analyses, an expedited reconnaissance report, for the White River Comprehensive Study appears to have been prepared in accordance with applicable policy and regulation including ER1105-2-100.

8/4/01

Roger C. Hicklin
Chief
Plan Formulation Section

CERTIFICATION OF LEGAL REVIEW

The feasibility cost share agreement for the White River Basin Comprehensive Study has been fully reviewed by the Office of Counsel, Memphis District, and is approved as legally sufficient.

8/6/10
Date

DAVID E. SIRMANS
District Counsel

White River Basin Comprehensive
Section 905(B) (WRDA of 1986) Analysis

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WHITE RIVER BASIN COMPREHENSIVE

SECTION 905(B) (WRDA of 1986) ANALYSIS

September 2001

1. STUDY AUTHORITY

a. The White River Basin Comprehensive Study is being carried out under the Corps of Engineers' General Investigations (GI) Program. This Section 905(b) Analysis was prepared as an initial response to Section 729 of the Water Resources Development Act (WRDA) of 1986, as modified by Section 202 of WRDA 2000, which reads as follows:

"SEC 202. WATERSHED RIVER BASIN ASSESSMENTS.
Section 729 of the Water Resources Development Act of 1986 (100 Stat. 4164) is amended to read as follows:

SEC. 729. WATERSHED AND RIVER BASIN ASSESSMENTS.

(a) IN GENERAL. –The Secretary may assess the water resources needs of river basins and watersheds of the United States, including needs relating to-
(1) ecosystem protection and restoration;
(2) flood damage reduction;
(3) navigation and ports;
(4) watershed protection;
(5) water supply; and
(6) drought preparedness.

(b) COOPERATION. – An assessment under this subsection (a) shall be carried out in cooperation and coordination with-
(1) the Secretary of the Interior;
(2) the Secretary of Agriculture;
(3) the Secretary of Commerce;
(4) the Administrator of the Environmental Protection Agency; and
(5) the heads of other appropriate agencies.

(c) CONSULTATION. – In carrying out an assessment under subsection (a), the Secretary shall consult with Federal, tribal, State, interstate, and local government entities.

(d) PRIORITY RIVER BASINS AND WATERSHEDS. - In selecting river basins and watersheds for assessment under this section, the Secretary shall give priority to ---
(1) the Delaware River basin;
(2) the Kentucky River basin;
(3) the Potomac River basin;
(4) the Susquehanna River basin; and
(5) the Williamett River basin.

(e) ACCEPTANCE OF CONTRIBUTIONS. --- In carrying out an assessment under subsection (a), the Secretary may accept contributions, in cash or in kind, from Federal, tribal, State, interstate, and local governmental entities to the extent that the Secretary determines that the contributions will facilitate completion of the assessment.

(f) COST-SHARING REQUIREMENTS.---

(1) NON-FEDERAL SHARE.---The non-Federal share of the cost of an assessment carried out under this section shall be 50 percent.

(2) CREDIT.---

(A) IN GENERAL.--Subject to subparagraph (B), the Secretary may credit toward the non-Federal share of an assessment under this section the cost of services, materials, supplies, or other in-kind contributions provided by the non-Federal interests for assessment.

(B) MAXIMUM AMOUNT of CREDIT.---The credit under subparagraph (A) may not exceed an amount equal to 25 percent of the costs of the assessment.

(g) AUTHORIZATION OF APPROPRIATIONS.--- There is authorized to be appropriated to carry out this section $15,000,000."

b. Funds in the amount of $375,000 were allocated in Fiscal Year 2001 to conduct the reconnaissance phase of the study.

2. STUDY PURPOSE

The study purpose is to develop a comprehensive watershed plan for the White River Basin. The comprehensive plan will serve as a framework for the environmentally sustainable development of water resources within the White River Basin. The problems and potential solutions will be examined in a comprehensive manner because of the interrelationships of the problems and potential solutions to all of the significant resources in the basin.

The primary objectives of the study are to comprehensively analyze the basin problems and opportunities and find possible solutions to these needs. The comprehensive study may or may not recommend further Corps studies or projects. Some alternatives may be identified that will be implemented by other Federal, state, or local agencies. In order to accomplish this, the significant resources in the basin will be identified. A conceptual "model" will be developed to describe the interrelationships of the significant resources in the basin to provide a framework for evaluation of alternatives. This model will be descriptive and likely diagram various functions and processes in the basin. This will serve as a guide in determining the completeness of the studies and allow information gaps to be filled prior to completing studies. The structure, functions, and processes of the ecosystem will be identified under the framework of this conceptual model.

The existing conditions of the resources will be examined and projections made of the future conditions of the resources Information produced by the study will be utilized during analysis of ongoing projects and studies. Likewise, information gathered from ongoing studies will be incorporated into the comprehensive study. The comprehensive study will be used in evaluating operation of existing projects.

3. LOCATION OF PROJECT/CONGRESSIONAL DISTRICTS

The White River Basin comprises approximately 27,765 square miles, of which 10,622 square miles are in the southern part of Missouri and the remaining 17,143 square miles are in northern and eastern Arkansas. The White River basin contains 5 large Corps multi-purpose lakes: Beaver, Table Rock, Bull Shoals, Norfork, and Greers Ferry (see Section 11 below, study area map). Clearwater Lake is also operated by Little Rock District Corps of Engineers, however, it is a smaller lake primarily used for flood control. The White River basin includes over 150 miles of flood control levees along the White River and its tributaries.

Interest in the basin includes flood control, water supply, hydropower, navigation, environmental restoration and protection, and recreation. The lower portion of the basin is significant as a migratory waterfowl wintering area and includes several Federal wildlife refuges and state management areas that comprise one of the largest remaining areas of bottomland hardwood forest in the Mississippi Valley.

The White River Basin is comprised of the following congressional districts: Berry, AR-01; Snyder, AR-02; Hutchinson, AR-3; Ross, AR-04; Blunt, MO-07; Emerson, MO-08; Skelton, MO-4

4. DISCUSSION OF PRIOR STUDIES, REPORTS, AND EXISTING WATER PROJECTS.

The White River Basin has been recognized for the importance of its resources to the States of Arkansas and Missouri and the nation and a corresponding large number of studies or projects have been completed and are underway in the basin. The comprehensive study will not halt other ongoing Corps of Engineers efforts in the basin. Information produced by the study will be utilized during analysis of ongoing projects and studies. Likewise, information gathered from ongoing studies will be incorporated into the comprehensive study. Information will be exchanged with the present and future study efforts to capitalize on the synergism of the work efforts.

Ongoing Federal projects in the basin include in the Little Rock District: Beaver Lake, Arkansas; Bell Foley Lake, Arkansas; Black River at Highway 69 Bridge, Arkansas; Bull Shoals, Arkansas; Clearwater Lake, Missouri; Table Rock Lake, Missouri; Greers Ferry Lake, Arkansas; Hurricane Lake Wildlife Management Area, Arkansas; Little Red River Agricultural Water Supply, Arkansas; Lake Taneycomo, Missouri; and White River Minimum Flows, Arkansas and Missouri. Memphis District projects and studies include: Grand Prairie Area Demonstration Project, Arkansas; White River Navigation, Arkansas; Boydsville, Arkansas; Little Red River, Arkansas; and White River Maintenance, Augusta to DeValls Bluff, Arkansas.

Many Federal agencies (EPA, USFWS, NRCS, USGS, SWPA, etc.) have ongoing efforts in the basin. Full use will be made of any information developed from these efforts. Any state efforts will also be utilized fully.
Comprehensive studies will complement the water resource planning activities currently underway. Information available from these prior studies will be reviewed and utilized as appropriate.

5. PLAN FORMULATION

The primary emphasis of plan formulation activities will be on identification of the basin's water resources related problems and opportunities. However, where local interest is sufficient to address identified concerns, the planning process will continue until recommended solutions are developed. A basin conceptual model of the significant resources and uses in the basin will be developed. This model will be used throughout the study to tie the relationships of the uses and significant resources into a comprehensive view of the basin. This model will be used in development and evaluation of the comprehensive plan to ensure that all effects on the uses and significant resources in the basin are considered. These potential solutions will be developed into a comprehensive plan of improvement for the basin and evaluated to determine Federal interest in implementation. If Federal interest in implementation is determined, authorities will be examined to determine the appropriate method of optimization and implementation. Some alternatives may be identified that will be implemented by other Federal, state, or local agencies. Planning steps after identifying problems and opportunities are: inventory and forecast; formulation of alternative plans; evaluating alternative plans; comparing alternative plans; and finally selecting a plan.

a) Identified Problems

(1) Existing Conditions

Historically the basin's natural ecosystem condition was primarily forested. The construction of the Corps lakes for flood control resulted in water related recreation in the upper basin or mountain area. Tailwater trout fishing has become a major industry. The population of northwest Arkansas and southwest Missouri has increased greatly over the years. Animal feeding operations have become very numerous in the upper basin and contribute greatly to the local economy. Most of the economy in the lower basin revolves around agriculture. In order to move their commodities to market, the use of barges has become very important. The White River is seasonally navigable for approximately 250 miles.

The Corps lakes in the upper basin and construction of levees in the lower basin have provided flood control for the basin. These lakes also provide recreation, hydropower and water supply for the area. The lakes provide a very unique environment for enhancing fish and wildlife values in the basin. Much of the historically bottomland forested areas in the basin was cleared and farmed for agricultural production. However, the lower end of the White River has one of the largest remaining tracts of seasonally flooded bottomland hardwoods left in the Mississippi Alluvial Valley.

Groundwater in the Grand Prairie area of the basin meets the criteria for being designated a critical aquifer. Agriculture is a major user of the groundwater in the lower basin.

The "existing conditions" for the various significant resources will be examined through the study. A GIS will be developed to contain spatial data on significant resources in the basin. The level of detail will be determined for each significant resource as appropriate. During the study, one or more units of measure will be determined for each significant resource in the basin. These units of measure will likely be determined based upon some measurable and describable effect on the resource.

(2) Expected Future Conditions

The future without project conditions for the significant resources will be examined to aid in the determination of problems and needs of the basin. Trends will be identified that relate to significant resources and predicting future conditions. Population, energy demand, water supply, and conditions of the aquifers will be among the many areas the study will examine. A scenario-based analysis will be performed and alternatives will be developed. This will ensure that the potential problems and opportunities are identified for the various uses and significant resources. The conceptual model will be used to tie the various potential changes into a comprehensive view of the future conditions.

(3) Problems and Opportunities Overview - Problems warranting Federal participation in the study.

The problems and opportunities in the basin were examined to develop a scope of studies to identify and determine their extent. One of the first problems is in developing a complete understanding to the interactions of the significant water uses and resources in the basin as changes in the uses and resources occur. Once an overall understanding of the interactions is gained, the problems could be divided into the upper basin and the lower basin because of the significant geographic differences.

Upper basin problems – Rapid population growth and development are increasing the amount of municipal and industrial water use and wastewater generated. While increased water needs, increased wastewater discharge, and agricultural uses are contributing to decreased water quality, the capability of the water resources to sustain these loading increases is not known. Studies are needed to determine the effects of the increased runoff on the ecosystem and to determine if the problems will affect the lakes and water based recreation in the future.

Lower basin problems – In the lower basin, much of the previously forested area has been converted to cropland. The alluvial and Sparta aquifers are being depleted in some areas. The counties suffer from the problems common to the Mississippi Delta and some have lost population in recent years. The lower portion of the river is seasonally navigable, but during low flows, shipments must be diverted to other ports. Water quantity has become a major concern since flows in the river are controlled and water is being used for a variety of purposes. In contrast to the upper basin, the primary concerns expressed in the lower basin relate to water quantity, not quality. The wetlands in the lower basin are not only nationally significant, but also recognized internationally. Studies are necessary to identify the effects of the current flow regime and the impacts that the future flow regimes could have on wetlands.

The primary goal of the comprehensive study is to develop a basin-wide comprehensive plan of improvement. To determine this, we formed an interagency planning ream consisting of Federal and State agencies from both Missouri and Arkansas and stakeholders from the basin. The interagency planning team met on several occasions to identify the needs of potential sponsors and to further define what is necessary for a basin-wide comprehensive study. Every effort was made to accommodate the sponsors' needs; however, cost constraints limited the detail in some cases.

A conceptual model will be developed to attempt to describe the interrelationships of the various significant resources and forces affecting them. This model will be descriptive and likely

diagram various functions and processes in the basin. This will serve as a guide in determining the completeness of the studies and allow information gaps to be filled prior to completing studies. The structure, functions, and processes of the ecosystem will be identified under the framework of this conceptual model.

(b) Alternative Plans

The water resources related problems, needs, and opportunities of the basin will be examined in a comprehensive and holistic manner. The conceptual model will be reexamined to determine if the studies have captured the interrelationships of the various significant resources and processes affecting them. Existing, future without, and the natural ecosystem conditions, where appropriate, for each significant resource will be examined concurrently to determine problems and opportunities.

Alternatives will be formulated to address the problems and opportunities identified in the study. These alternatives will be examined to determine their effects on the significant resources.

c) Identification of Basin Comprehensive Plan

The alternatives formulated will be developed using the basin conceptual model to tie the alternatives together into a comprehensive basin plan of improvement. The comprehensive basin plan will be evaluated to determine Federal interest in implementation. The comprehensive basin plan developed during the feasibility phase may or may not recommend further Corps studies or projects. If Federal interest is found, each alternative will be examined for implementation authority. Many of the alternatives recommended for implementation under the comprehensive examination may be implemented under existing authorities, including the continuing authorities program. For those alternatives that cannot be implemented under existing authorities, the normal authorization process will be followed. The study time and cost estimates in this report do not reflect processing of decision documents seeking authority for construction of identified alternatives.

(1) Projects that may be implemented under existing authority

Existing Corps authorities will be examined to determine if projects could be modified to implement measures recommended by the comprehensive study. If modifications to existing projects are proposed, further analysis will likely be conducted under Section 216, Review of Completed Projects.

(2) Projects that may be implemented under the continuing authorities program

The Corps has several delegated authorities for projects meeting certain criteria. If projects are identified under the comprehensive study, use of these authorities may provide more rapid implementation of the measures. The authorities and requirements are summarized below.

a) Section 205 of the Flood Control Act of 1948 - This provides the same complete project and adequate degree of protection as would be provided under specific Congressional authorization.

b) Section 206 of the Water Resources Development Act of 1996 Aquatic Ecosystem - This provides for planning, design, and construction of aquatic ecosystem restoration and protection projects, when it is found that the project will improve the quality of the environment, is in the public interest and is cost effective.

c) Section 208 of the Flood Control Act of 1954 - Clearing and Snagging Projects. This allows for the removal of obstructions, including sediment from channels.

d) Section 1135 of the Water Resources Development Act of 1986 Fish and Wildlife Restoration - This provides for constructing environmental restoration projects where a Corps project contributed to the degradation of the environment.

e) Emergency Streambank and Shoreline Protection, Section 14 of the Flood Control Act of 1946 - This provides protection from streambank or shoreline erosion to public facilities by the construction or repair of protection works.

f) Section 107 of the River and Harbor Act of 1960 - Small Navigation Projects. This authorizes construction, operation and maintenance of small river and harbor improvement projects.

(3) Comprehensive projects requiring further authorization by Congress

Alternative evaluation may yield needed projects to address the problems and opportunities that are beyond the scope of existing authorities and the continuing authorities program. Potential solutions, outside the mission of the Corps, will be recommended for implementation by others. The study will identify the necessary actions for implementation by the Corps and provide a time and cost estimate. Some possible examples would be an environmental corridor along the White River and major tributaries, and comprehensive wastewater treatment to protect and restore aquatic ecosystems.

(4) Evaluation tools for future use

The study will develop models that could be used by others in the evaluation of future actions. These tools could include a geographic information system, detailed water quality models of Beaver Lake, Table Rock Lake and Lake Taneycomo, an overall basin model that would account for water quality, and other models that could be transferred to the sponsor at the conclusion of the study effort.

(5) Comprehensive Study Report

The comprehensive report would present the results of the studies in a concise manner.

(6) Significant Resources

The following is a list of significant resources and water uses in the basin that will be examined in the study.

1) Basin Ecosystem and uses relationships (a conceptual model)
2) Environmental Resources
   a) Aquatic Ecosystem
      i) Upper basin streams
      ii) Lakes and Reservoir
      iii) Tailwater
      iv) Transition zone
      v) Main Stem
      vi) Lower tributaries
   b) Terrestrial Ecosystem
3) Migratory Birds
4) Groundwater/Agriculture
5) Water supply/Wastewater
6) Recreation
7) Endangered Species
8) Navigation/Transportation
9) People and Economy
10) Hydropower/Power generation
11) Flood Control

The following describe assumptions, questions to be answered, and studies necessary to analyze these significant resources.

1) Basin Ecosystem and Uses Relationships (a conceptual model)

A conceptual model of the basin's ecosystems and uses will be developed that will include several models of how changes or uses in an area effects other areas. The interagency planning team will be involved in the development with the sponsor receiving credit for their participation. Memphis District will be responsible for the model presentation and write-up.

2) Environmental Resources

a. Aquatic Ecosystems

The aquatic ecosystems will be defined as the water body and its immediate area of influence including riparian zone and floodplain.

Various types or categories of aquatic ecosystems in the basin will be developed. These types will be categorized as follows: 1) Upper basin streams, 2) /Lakes and Reservoirs, 3) Tailwaters, 4) Transition zone, 5) main stem and oxbows, and 6) Lower tributaries. The key factors affecting the aquatic habitat would be determined including water quality, sediment loads, temperatures, water levels and flows, and other factors.

i. Upper basin streams

The upper basin streams will be examined to determine the degradation of the aquatic habitat. The same hydrologic unit codes as the U.S. Geological Survey will be used. These upper basin streams include a Wild and Scenic River and a National River. These streams include the James

River, Crooked Creek, and the Strawberry River and other streams in the Ozark area. A sub-basin assessment will be performed to determine which streams are experiencing losses in aquatic habitat. A method will be developed to translate the decreases in water quality and changes in the riparian zone into losses in aquatic habitat. The trends in development and population growth will be examined to determine likely changes in the aquatic habitat of the upper basin streams and the parameters affecting the habitat including water quality.

To facilitate assessment of watershed conditions and health, the White River Basin will be divided into smaller sub-basins. Factors such as water temperature, nutrient levels, contaminants and dissolved oxygen, which are deemed significant, will be quantified for each sub-basin and a condition and risk assessment (trend analysis) will be developed. Condition assessments will include a discussion of habitat and abiotic parameters and how they are or eventually may affect the aquatic ecosystem. Assessing watersheds at a finer scale will help to identify localized problems and facilitate development of solutions. An Interagency Working Group will focus the study on the factors and landscape parameters, which are most important.

ii. Lakes and Reservoirs

The lakes to be examined include the main flood control and multipurpose reservoirs in the basin. Historical conditions will be assumed to be the condition of the lakes when they were first filled. Population projections will directly relate to the development around the lakes and the use for water supply and wastewater discharge. Given that water quality is one of the main factors influencing the lakes, water quality parameters will be examined to determine their effects on the aquatic habitat of the lakes. Habitat suitability index for the Habitat Evaluation Procedure (HEP) model including water quality will be examined. Other models will be examined to find best fishery model to account for likely changes in conditions.

Beaver Lake – A detailed water quality model will be developed.
Table Rock Lake – A detailed water quality model will be developed
Bull Shoals Lake - Water quality trends and their effects on the aquatic ecosystem will be determined
Norfork Lake – Water quality trends and their effects on the aquatic ecosystem will be determined
Greers Ferry Lake – Water quality trends and their effects on the aquatic ecosystem will be determined
Clearwater – Water quality trends and their effects on the aquatic ecosystem will be determined
Taneycomo – A detailed water quality model will be developed

The objective of the studies on Beaver, Table Rock, and Taneycomo Lakes is to obtain the necessary information (temperature, nutrients, algae, and dissolved oxygen parameters) for use in calibrating a numerical model of hydrodynamics and water quality. The model will then be developed and used to predict water quality trends. Due to funding limitations, it was decided by the Interagency Planning Team that modeling on Bull Shoals, Norfork, Greers Ferry, and Clearwater Lakes would be postponed for a possible phase two if the desired interest develops by a potential sponsor.

Major potential outputs of the comprehensive study include ecosystem restoration by protecting the watersheds that enter into the lakes and potential environmental infrastructure improvements to improve the quality of water entering the lakes. Improvements to the water quality of upper basin tributaries that enter into the lakes, such as the James River, would have a direct impact on the lakes themselves.

iii. Tailwaters

Most trout fisheries in the southern U.S. are located in cold tailwaters below dams with hypolimnetic releases. Harsh conditions that are often present in these systems can inhibit growth potential and reduce survival of trout stocked into these systems. Since most tailwater trout fisheries are managed for put-and-take losses of fish due to inhospitable conditions can be expensive. Return rates for stocked trout vary due to water quality and quantity in the receiving water. Stocking rates and fishing pressure can also be major factors in determining trout survival. The minimum flow data will develop assessment techniques. Existing data will be examined to determine existing conditions and future trends. Problems and needs will be determined from this data and recommendations made accordingly.

iv. Transition zone

The transition zone is the area of the main stem below the tailwaters where the river temperature is too warm for cold water species but is not warm enough to be highly productive for warm water species. Existing data will be examined to determine existing conditions and future trends. Problems and needs will be determined from this data.

v. Main Stem

Existing data will be examined to determine existing conditions and future trends. Problems and needs will be determined from this data.

vi. Lower tributaries

The lower basin tributaries are the tributaries that enter into the White River below the tailwaters. These include the Cache River, Bayou de View, Village Creek, Big Creek, and other streams. Existing data will be examined to determine existing conditions and future trends. Problems and needs will be determined from this data.

b) Terrestrial Ecosystem

Ecosystem analyses will be conducted in the delta portion of the study area to include the watershed of the tributaries and mainstem wetlands. A complete examination of the delta area will be conducted by major watershed to include ecosystem restoration options.

Existing data will be examined to determine existing conditions and future trends. Problems and needs will be determined from this data.

3) Migratory Birds

A literature search will be performed to identify historic and current conditions for neotropical migratory birds, waterfowl, and other migratory species to determine their population status within the basin. The current extent of habitat loss and degradation, and its affect on migratory bird populations will be determined. Future habitat and population trends will be projected, and migratory bird habitat improvement and restoration measures will be identified.

4) Groundwater-Agricultural water supply

Existing information will be used to examine the existing and future trends in ground water and agricultural water supply. A literature search will be performed in the upper basin to determine the relationship between the surface water quality and the danger of contamination of the aquifers due to the Karst topography. The study description of the aquifers and current water use will be examined. The draw on the aquifers for water use in the study area for agriculture, municipal, and industrial use will be examined. Potential threats to the aquifers from contamination will also be examined. The potential irrigation project in the area will be included in the future conditions. Existing groundwater models will be examined for inclusion in the basin-wide model.

5) Water Supply/Wastewater

Existing municipal and industrial water supply will be examined. Current wastewater treatment plants will be examined to determine their adequacy. The current effect of wastewater and pollution on the water supply will be examined. The project will predict, using population projections, the demands of the municipal and industrial water in the basin and the wastewater discharges. It will predict the water quality issues that threaten the lakes and identify possible solutions that can be investigated to determine its feasibility. Studies include examining population predictions to determine the demand of existing facilities and to determine the need for additional water supply and waste water treatment.

6) Recreation

A complete recreation analysis of the basin will be performed. Studies will include examining population predictions to determine the demand on existing facilities and to determine the need for additional facilities. The economic value of recreation will be computed.

7) Endangered Species

Existing data will be examined to determine existing conditions and future trends of Federally listed threatened and endangered species as well as state species of special concern. Problems and needs will be determined from this data. The existing endangered or threatened species (State and Federal) will be inventoried.

8) Navigation/Transportation Needs

The transportation needs of the basin will be examined to determine problems and opportunities. The majority of the effort will include incorporation of existing studies and data by others and the navigation studies to characterize the compete range of transportation needs in the basin including road, railroad, airport, and waterborne traffic. Projections of the future transportation needs will be gathered and related to the projections of future development and population growth. Transportation studies performed by the states' highway departments will be incorporated. An inventory of existing transportation facilities and uses will be included. Navigation data will be incorporated for existing studies including the number of tons that are being transported on the White River. Projections of future growth of these numbers will be made.

The effect of future transportation will be related to other significant resources and uses including fragmentation of forest due to bisecting roads or highways.

9) People and Economy

Examining the population and economic trends is essential in gaining an understanding of the likely future conditions and water resource problems and needs of the basin. Many of the current water resource related problems relate to economic and population growth in the basin. County population and economic trends for the existing and future without project conditions will be estimated using projections from existing data sources. Trends in agriculture and other sectors of the economy will also be examined.

10) Hydropower/Power Generation Needs

The existing power sources that use hydropower or the river for cooling will be inventoried. From existing literature sources, the power needs of the basin will be examined and existing water needs for power generation and cooling will be examined. Estimates from existing sources on the future power generation trends for hydropower/power generation in the basin will be examined. Estimates will be made on the long-term trends in the demand for power and the likelihood of adding additional power plants with associated water needs.

11) Flood Control Needs

Flooding in the basin will be examined to determine the flood control needs and opportunities including non-structural opportunities to reduce flooding and gain additional ecosystem restoration benefits. Work being done for the minimum flow study will be incorporated and expanded to develop a better understanding of the flood control needs and opportunities in the area immediately influenced by the reservoirs. In other areas in the basin, a literature search and existing information will be gathered to determine areas where flooding in the basin is occurring or likely to increase in the future.

6. FEDERAL INTEREST

The upper White River Basin contains 5 large Corps multi-purpose lakes: Beaver, Table Rock, Bull Shoals, Norfork, and Greers Ferry and one Corps reservoir, Clearwater Lake, which is primarily used for flood control, (see Section 11 below, study area map). The water in the upper basin is controlled through this system of lakes. The basin includes over 150 miles of flood control levees along the White River and its tributaries. Interest in the basin includes flood control, water supply, hydropower, navigation, environmental restoration and protection, and recreation. The lower portion of the basin is significant as a migratory waterfowl wintering area. The basin includes three National Forest (Mark Twain, Clark, and Ozark), one national river (Buffalo), two national senic rivers (Eleven Point and Ozark) and eight state wildlife management areas that comprise one of the largest remaining areas of bottomland hardwood forest in the Mississippi Valley.

Because of the significance of the resources, there is Federal interest in conducting the comprehensive study. Though this study will concentrate on identification and quantification of the problems and opportunities, it is likely that alternatives will be identified for flood control, navigation, and/or ecosystem restoration. The alternatives formulated will be developed, using

the basin conceptual model to tie the alternatives together into a comprehensive basin plan of improvement. The comprehensive watershed plans will be evaluated to determine Federal interest in implementation. The comprehensive basin plan developed during the feasibility phase may or may not recommend further Corps studies or projects. If Federal interest is found, each alternative will be examined for implementation authority. Many of the alternatives recommended for implementation under the comprehensive examination may be implemented under existing authorities, including the continuing authorities program. For those alternatives that cannot be implemented under existing authorities, the normal authorization process will be followed. Ecosystem restoration projects that may result include riparian restoration corridors, watershed restoration, waterfowl habitat restoration, aquatic habitat restoration, wetlands restoration, and other nationally significant outputs.

The lower White River Basin contains the largest remaining concentration of seasonally flooded bottomland hardwood forest in the Mississippi Alluvial Valley, and it provides critical habitat for wintering waterfowl and other migratory birds. In fact, the lower White River wetlands and associated Grand Prairie region to the west comprise the most important wintering area for mallards in North America. In 1990, wetlands along the Cache and lower White Rivers received special designation as a "Wetlands of International Importance" under the Ramsar Convention. The lower White River Basin contains three major national wildlife refuges (White River, Cache River, and Bald Knob). Also, the lower basin contains numerous state wildlife management areas and natural areas.

7. PRELIMINARY FINANCIAL ANALYSIS

The State of Arkansas has stated its intent to sponsor the study through the Arkansas Soil and Water Conservation Commission, the Arkansas Game and Fish Commission, and the Arkansas Department of Natural Heritage. The State of Missouri has stated its intent to sponsor the study through the Missouri Department of Natural Resources. Appendix B contains letters of intent from these agencies. The Missouri Department of Conservation and The Nature Conservancy have also expressed an interest in participating.
WRDA 2000 specifies cost sharing requirements for sponsors to be 50% non-Federal contributions, with up to 25% of total project costs being in-kind services.

8. SUMMARY OF FEASIBILITY STUDY ASSUMPTIONS

a) The study will focus on identifying the water resource problems and opportunities. While possible solutions will be identified, all implementation studies and optimization will likely be conducted through subsequent efforts including continuing authorities, existing authority for other projects, or as specifically authorized studies resulting from the comprehensive study. An environmental assessment will be conducted as part of the comprehensive study. It will determine if the comprehensive study is a major Federal action having a significant impact on the human environment. Working with MVD staff the appropriate level of NEPA documentation will be determined. If necessary a programmatic EIS will be prepared. .

b) The comprehensive study will benefit from work conducted for ongoing studies and projects in the White River Basin. Information produced by the study will be utilized during analysis of ongoing projects and studies. The results obtained from the comprehensive study will be used in evaluating operation of existing projects.

c) Cultural resources associated with projects that may develop as a result of this comprehensive study will be coordinated fully in compliance with applicable laws and regulations.

d) The USFWS will provide a Draft Coordination Act Report.

e) Alternatives will not be developed to the level of detail for an MCACES cost estimate.

f) The schedule assumes concurrent approval of the cost sharing agreement and the Section 905(B) Analysis report.

9. FEASIBILITY PHASE MILESTONES

Initiate Interagency Planning Team Meetings/Scoping Meetings	1/1/01
Initiate FCSA Negotiations	6/1/01
Submit 905(b) Analysis	7/30/01
905(b) Approval	9/30/01
PMP Approval by PRB	9/30/01
Complete FCSA Negotiations	8/30/01
Execute FCSA	9/15/01
Public Hearing	3/1/02
Public Hearing	4/1/02
Alternative Formulation Briefing	4/1/05
Draft Report	6/1/05
Final Report	10/1/05
DE Notice	10/1/05
Complete Basin-Wide Comprehensive Study	10/1/05

10. FEASIBILITY PHASE COST ESTIMATE

See Appendix A.

11. PROJECT AREA MAP

WHITE RIVER BASIN, AR & MO

12. POTENTIAL ISSUES EFFECTING INITIATION OF FEASIBILITY PHASE

There are currently no issues affecting initiation of the study effort.

13. VIEWS OF OTHER RESOURCE AGENCIES

In general, views toward the study are positive. Collectively, the agencies with interest in the White River feel that more information is needed prior to making decisions with regard to watershed management. To date, formal coordination has been conducted with other resource agencies to determine the areas of study required. An interagency planning team was formed. A list of invited participants is attached in Appendix C. The purpose of the interagency planning team was to coordinate the development of the scope of studies. The interagency planning team met on several occasions. Attached are letters written in support of the project in Appendix D.

14. RECOMMENDATIONS

I recommend that the White River Basin Comprehensive Study proceed to the feasibility phase. Further, I recommend that the draft Feasibility Cost Sharing Agreement submitted with this 905(b) Analysis be approved and study funds be provided as soon as possible.

JACK V. SCHERER
Colonel, Corps of Engineers
District Commander

Activity Number	Appendix A Line Item Cost Estimate	Cost Estimate	Sponsor In-Kind	
1100	Basin Ecosystem Resources and users Relationships (A concepetual model)	81,000	30,000	
	BASIN ENVIRONMENTAL RESOURCES			
1200	Literature /Data Search	91,000	45,000	
1300	Environmental Coordination	75,000		
1400	Environmental Appendix	32,000		
1500	Aquatic Ecosystems Sub-Basin Assessments	161,000	135,000	
1600	Watershed Restoration Plans	495,000	200,000	
1700	Aquatic Ecosystem-Wild & Scenic River and National Rivers	6,500		
1800	FWS Coordination	72,000		
1900	**Hydrologic Effects on Lower Basin Wetlands (King Study)**			
	Data required for the King Study	561,500		
1900.1	Satellite Imagery			
1900.2	Elevation Surveys 15 transects along the White, 3 along Bayou de View and 3 along the Cache River	200,000		
1900.3	Hydraulic modeling efforts	170,000		
1900.3	Stage/discharge on Cache River and Bayou DeView.	15,000		
1900.4	10-day average MSL stage on the Mississippi at the mouth of the White	8,000		
1900.5	Gather MSS or TM imagery on White River main stem, Cache River, and Bayou DeView	15,000		
	Other Environmental Resource Studies			
2000	Terrestrial Habitat Evaluation	40,000	30,000	
2100	Wetlands Evaluation	40,000	30,000	
2200	Migratory Birds	40,000	30,000	
2300	Endangered/Threatened Species	40,000	30,000	
2350	Evaluation of Permanent Wetlands in the Lower White River	205,000		
2400	**Evaluation Of Ecosystem Restoration Options Within Lower White River Basin (Heitmeyer Study)**	915,000		
2500	Navigation/Transportation Needs	235,000	215,000	
2600	People and Economy	55,000		
2700	Recreation	250,000	210,000	
	Hydraulic Studies			
2800	Groundwater-Agricultural Water Supply	182,000	162,500	
2900	Water Supply/Wastewater Treatment	80,000	40,000	
	GIS			
3000	**Data Acquisition**			
3000.3	Data Queries / Assistance from GIS - 11 Major Areas of Study			
	Contractors Communication / Assistance /Interaction			
	Administrative GIS Items (Presentations, Explanations, Coordination)	100,000		

Appendix A Line Item Cost Estimate

Activity Number		Cost Estimate	Sponsor In-Kind	
3000.4	**Pilot Project**			
	Generate data and sample queries for one county within the project area	26,000		
3000.5	**Data Management**			
	Perform data integration of downloaded data to USACE Standards			
	Acquire one Computer data server / storage server including upgrades and maintenance for 4 years of project	67,000		
	Water Uses			
3100	**Hydropower/Power Generation Needs**			
	A compilations of the existing data a studies involving hydropower and power generation needs in the basin will be made.	50,000		
3200	**Flood Control Assessment**			
	The existing data on basin flooding will be evaluated and literature sources including newspapers will be used to document the flooding potential in the basin.	400,000	60,000	
3300	**Aquatic Ecosystem -Lakes/Reservoirs**			
3300.1	Quantify water quality in the Beaver Lake.	376,500	276,500	
3300.2	Quantify water quality in the Table Rock Lake.	1,148,000		
3300.3	Quantify Water quality in Lake Taneycomo	330,000		
3300.4	Development of Hydrodynamic models of Beaver and Table Rock Lakes	147,600	147,600	
3300.5	Aquatic Ecosystem Fishery Studies (Kilgore Study)	182,000		
	Habitat Improvement Bullshoals and Table Rock Lakes			
100	**PLANNING, AND PROJECT MANAGEMENT**			
100.1	Public Involvement	105,600	40,000	
100.2	Study Management	405,400	167,925	
100.3	Budget Preparation & Support	165,600	40,000	
100.4	Plan Formulation and Evaluation	302,600	60,000	
100.5	Prepare Draft of modern historic conditions, exisitng conditions, and future without project conditions portions of the Report.	40,200		
100.6	Preliminary Draft of Main Report	80,000		
100.7	Assemble/Print Preliminary Draft Report	8,000		
100.8	Technical Review	60,000		
100.9	Sponsor Review.	60,000	60,000	
100.10	Revise/Print Preliminary Draft Report - CEMVD/OCE Review.	5,000		
100.11	Review Support	50,000	50,000	
100.12	Prepare draft Study Plan	100,000		
100.13	Revise/Print Draft Report/PSP	20,000		
100.14	Prepare and Print Final Report	12,000		
100.15	Budget Preparation &Support	160,000		
100.16	Supervision and Review - Supervise all budget request	65,600		
100.17	Revise Draft Appendix - CEMVD/HQUSACE Review.	12,000		
100.18	Revise Draft Appendix - Public Review	2,000		
100.19	Final Appendix	2,000		
	Total	8,548,100	2,059,525	
		Sponsor Cash 25%	2,137,025	
		Federal Cash 50%	4,274,050	

Appendix B

Non-Binding Letter of Intent from potential Sponsors

Arkansas Game & Fish Commission
2 Natural Resources Drive Little Rock, Arkansas 72205

Hugh C. Durham, IV
Director

July 16, 2001

Colonel Jack V. Scherer
District Engineer
Memphis District Corps of Engineers
167 North Main Street
Memphis, TN 38103-1894

Re: White River Basin Wide Comprehensive Study – Letter of Intent

Dear Colonel Scherer:

The Arkansas Game and Fish Commission (AGFC) intends to participate as a project sponsor in the White River Basin Wide Comprehensive Study provided an acceptable plan of study and cost-sharing agreement is negotiated. We have reviewed the draft feasibility cost-share agreement and are prepared to meet the requirements of project sponsorship.

The AGFC understands that the cost share requirements for non-federal sponsors is to be 50% of the total study cost with up to 25% of total project costs being in-kind services. Representatives from the AGFC have been working closely with your district to develop a project study plan and a cost estimate for the study. We look forward to continuing to work with you on this study in the future.

If you have any questions regarding the above, please contact Dr. Scott Yaich or me. Thank you.

Sincerely,

Hugh C. Durham
Director

Arkansas Soil and Water Conservation Commission

J. Randy Young, P.E.
Executive Director

101 EAST CAPITOL
SUITE 350
LITTLE ROCK, ARKANSAS 72201

PHONE 501-682-1611
FAX 501-682-3991

July 17, 2001

Colonel Jack V. Scherer
District Engineer
Memphis District Corps of Engineers
167 North Main Street
Memphis, Tennessee 38103-1894

Dear Colonel Scherer

The Arkansas Soil and Water Conservation Commission (the "Commission") intends to participate as a project sponsor in the White River Basin Wide Comprehensive Study provided an acceptable plan of study and cost-sharing agreement is negotiated. We have reviewed the draft feasibility cost-share agreement and are prepared to meet the requirements of project sponsorship.

The Commission understands that the cost share requirements for non-Federal Sponsors is to be 50% of the total study cost with up to 25% of total project costs being in-kind services. Representatives from the Commission have been working closely with your district to develop a project study plan and a cost estimate for the study. We look forward to continue working with you on this study in the future.

If you have any questions regarding the above, please contact Earl Smith, Mark Bennett, or me

Sincerely,

J. Randy Young, P.E.
Executive Director

JRY/ES/ddavis

Cc: Mr. Hugh Durham, Arkansas Game and Fish Commission
Mr. Stephen Mahfood, Missouri Department of Natural Resources
The Honorable Mike Huckabee, Governor - State of Arkansas

STATE OF MISSOURI
Bob Holden, Governor • Stephen M. Mahfood, Director
DEPARTMENT OF NATURAL RESOURCES
OFFICE OF THE DIRECTOR
P.O. Box 176 Jefferson City, MO 65102-0176

July 31, 2001

Colonel Jack V. Scherer
District Engineer
Memphis District Corps of Engineers
167 North Main Street
Memphis, Tennessee 38103-1894

Dear Colonel Scherer:

The Missouri Department of Natural Resources intends to participate as a project sponsor in the White River Basin Wide Comprehensive Study provided an acceptable plan of study and cost-sharing agreement is negotiated.

Representatives from the DNR have been working closely with your district, as well as staff of the Arkansas Soil and Water Conservation Commission and the Arkansas Game and Fish Commission, in order to develop a project study plan and a cost estimate for the study. Thank you for working with my staff to revise the study scope. I am optimistic we can reach agreement on the scope, cost and cost-share for the study. We look forward to continue working with you on this study in the future.

If you have any questions regarding the above, please contact Ed Knight at 573-751-8398.

Sincerely,

DEPARTMENT OF NATURAL RESOURCES

Stephen Mahfood
Director

SM:jm

Appendix C

Agencies that were invited to participate on the Interagency Planning Team

Mr. Hugh C. Durham, IV
Director
Arkansas Game and Fish Commission
2 Natural Resources Drive
Little Rock, AR 72205

Ms. Karen Smith, Director
Arkansas Natural Heritage Commission
1500 Tower Bldg., 323 Center St.
Little Rock, AR 72201

Mr. Allan J. Mueller
Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services
1500 Museum Road, Suite 105
Conway, AR 72032

Ms Jane M. Ledwin,
Acting Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services
608 Cherry St No 212
Columbia, MO 65201-7712

Mr. Gregg A. Cooke
Regional Administrator
EPA Region 6
1445 Ross Ave.
Dallas, TX 75202-2733

Mr. Dennis Grams,
Regional Administrator
EPA Region 7
901 N 5th St
Kansas City, KS 66101

Mr. J. Randy Young
Ark. Soil and Water Conservation Comm.
101 East Capitol, Suite 350
Little Rock, AR 72201

Mr. Jerry Conley, Director
Missouri Department Of Conservation
P. O. Box 180
Jefferson City, MO 65102-0180

Mr. Robert Ludwin
USGS
401 Hardin Road
Little Rock, AR 72211

Mr. Kalvin L. Trice
State Conservationist
Natural Resources Conservation Service
Room 3416, Federal Bldg.
700 W. Capitol Ave.
Little Rock, AR 72201

Mr. Roger A. Hansen,
State Conservationist
Natural Resources Conservation Service
Parkade Center, Suite 250
601 Business Loop 70 West
Columbia, MO 65203

Mr. Richard A. Weiss, Interim Director
Arkansas Dept. of Environmental Quality
P. O. Box 8913
Little Rock, AR 72219-8913

Mr. Paul Revis, Executive Director
Arkansas Waterways Commission
101 E. Capitol, Suite 370
Little Rock, AR 72201

Mr. Bethel Herrold
Southwest Power Administration
P. O. Box 1619
Tulsa, OK 74101

Ms. Cathie Matthews, Acting SHPO
Arkansas Historic Preservation Program
1500 Tower Bldg., 323 Center St.
Little Rock, AR 72201

Ms. Claire Blackwell, SHPO
MODNR Parks REC & Historic Prop
P O Box 176
Jefferson City, MO 65102-0176

Mr. Stephen Mahfood, Director
Missouri Dept. of Natural Resources
Post Office Box 176
Jefferson City, MO 65102

Mr. Richard Davies, Executive Director
Arkansas Dept. of Parks and Tourism
#1 Capitol Mall, Forth Floor
Little Rock, AR 72201

Mr. John Shannon, Director
Arkansas Forestry Commission
3821 West Roosevelt Road
Little Rock, AR 72204

Appendix D

Letters of Support from Agencies or Organizations Requesting the Study.

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
CIVIL WORKS
108 ARMY PENTAGON
WASHINGTON DC 20310-0108

27 SEP 1999

REPLY TO
ATTENTION OF

Ms. Judy Henderson
President, Arkansas Chapter
Sierra Club
Post Office Box 22446
Little Rock, Arkansas 72221

Dear Ms. Henderson:

I am replying to your letter of July 15, 1999, citing authorized and planned projects in the White River basin and calling for a comprehensive study to assess the entire ecosystem. I agree with you on the importance of the White River basin ecosystem.

The Army Corps of Engineers may conduct a study of the White River basin under Section 729 of Public Law 99-662, the Water Resources Development Act of 1986, as amended. Subject to the Congress providing funding, this office would support undertaking comprehensive watershed studies in many basins nationwide, including the White River basin.

I am asking Mr. David Reece, Chief of the Environmental and Economic Analysis Branch, in the Corps Memphis District, to contact you to explain more fully our process for initiating a new study. I trust that this explanation is helpful.

Sincerely,

Joseph W. Westphal
Assistant Secretary of the Army
(Civil Works)

CF: CRC
CECW-PC
SACW: FILE, READ, SIGN
J:\SHARED\SMITH,C\WHITERIVER.DOC

SA9072306

ARKANSAS CHAPTER
SIERRA CLUB
P.O. Box 22446
Little Rock, Arkansas 72221
(501) 224-2582

July 15, 1999

Joseph Westphal, Assistant Secretary of the Army for Civil Works
U.S. Army Corps of Engineers
108 Army Pentagon
Washington, DC 20310

Dear Mr. Westphal,

On behalf of the Arkansas Chapter of the Sierra Club, I am writing to you to express our concern about several major projects proposed for the Lower White River in Arkansas. We believe these projects, designed to promote navigation and provide irrigation water in the region, threaten an important ecosystem. The U.S. EPA, U.S. Fish and Wildlife Service and Audubon Society have all expressed opposition to these projects, and have asked for a comprehensive study to be done of the ecosystem. We would like your support in ensuring that such a study is completed before any major projects are undertaken on the river.

The Lower White River is a wonderfully diverse area. It contains the largest contiguous tract of bottomland hardwoods in North America. It has historically been referred to as "the Big Woods," and is all that remains of the original 24 million acres of floodplain forests in the seven states in the Mississippi River Alluvial Plain ecosystem. It is home to at least 240 bird species, including endangered bald eagles and least terns, and is a a major migratory area. Endangered mussels also live here, along with our state's only native bears. There are rare plant species, also.

The current proposals would involve channelization, irrigation projects and the possibility of a new dam. We are concerned about the negative aspects of all of these projects. We would not like to see any go forward, and believe that before any are given further consideration, a comprehensive study should be done of the entire ecosystem.

We appreciate your help and assistance in this matter.

Sincerely,
Judy Henderson
Judy Henderson
President Arkansas Chapter of the Sierra Club

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
CIVIL WORKS
108 ARMY PENTAGON
WASHINGTON DC 20310-0108

27 SEP 1999

REPLY TO
ATTENTION OF

Mr. Steven J. Shimberg
Vice-President
Office of Federal and International Affairs
National Wildlife Federation
1400 16th Street, N.W., Suite 501
Washington, D.C. 20036

Dear Mr. Shimberg:

I am replying to your letter of June 25, 1999, co-signed by seven other environmental interest groups. I am replying also to those co-signatories. Your letter cites several major projects in the White River basin and calls for a comprehensive study to assess the entire ecosystem and the needs of the people and wildlife that inhabit the basin. You indicate that the comprehensive study would provide the basis for an equitable, compatible water-use management plan for the basin.

The Army Corps of Engineers may conduct a study of the White River basin under Section 729 of Public Law 99-662, the Water Resources Development Act of 1986, as amended. Subject to the Congress providing funding, this office would support undertaking comprehensive watershed studies in many basins nationwide, including the White River basin.

I am asking Mr. David Reece, Chief of the Environmental and Economic Analysis Branch, in the Corps Memphis District, to contact you to explain more fully our process for initiating a new study. I trust that this explanation is helpful.

Sincerely,

Joseph W. Westphal
Assistant Secretary of the Army
(Civil Works)

CRC
CECW-PC
SACW (FILE, READ, SIGN)
KENNEDY/761-8529/22 SEP 99
MULTIPLE - SA9070804

SIMILAR LETTERS SENT TO:

Ms. Nancy S. DeLamar
Arkansas State Director and Vice President
The Nature Conservancy
601 North University Avenue
Little Rock, Arkansas 72205

Mr. Robert Dewey
Director, Habitat Conservation
Defenders of Wildlife
1101 14th Street, N.W., #1400
Washington, D.C. 20005

Mr. Rollin D. Sparrowe
President
Wildlife Management Institute
1101 14th Street, N.W., Suite 801
Washington, D.C. 20005

Mr. Evan Hirsche
Director, Wildlife Refuge Campaign
National Audubon Society
1901 Pennsylvania Avenue, N.W.
Suite 1100
Washington, D.C. 20006-3405

Mr. David Tobin
President and CEO
National Wildlife Refuge Association
1776 Massachusetts Avenue, N.W., Suite 200
Washington, D.C. 20036

Mr. Charles Clusen
Senior Policy Analyst
Natural Resources Defense Council
1200 New York Avenue, N.W., Suite 400
Washington, D.C. 20005

Mr. Jim R. Waltman
Director
Refuges and Wildlife
The Wilderness Society
900 17th Street, N.W.
Washington, D.C. 20006

SA 9070804

National Audubon Society • Defenders of Wildlife
National Wildlife Federation • National Wildlife Refuge Association
The Nature Conservancy • Natural Resources Defense Council
Wildlife Management Institute • The Wilderness Society

June 25, 1999

The Honorable Dr. Joseph W. Westphal
Assistant Secretary of the Army (Civil Works)
U.S. Army Corps of Engineers
108 Army Pentagon
Washington, DC 20310

Dear Dr. Westphal:

We are writing to express the serious concerns of our organizations regarding several major water projects planned for the Lower White River in Arkansas. We believe that these projects, to promote navigation and draw irrigation water from the Lower White River, threaten the integrity of this important ecosystem. The U.S. EPA and U.S. Fish and Wildlife Service have expressed serious concerns regarding these projects and are calling for completion of a comprehensive study of the White River Basin. We request your assistance in ensuring that such a study is undertaken prior to initiation of any major activities on the river.

The lower White River Basin of Arkansas stands as the largest contiguous tract of bottomland hardwoods in North America. This area constitutes a national natural treasure -- half a million acres of forested wetlands in a region that has otherwise been mostly cleared and drained for agricultural purposes. The "Big Woods," as it is called, is the "best that is left" of the original 24 million acres of floodplain forests in the seven states of the Mississippi River Alluvial Plain ecosystem. It includes the Cache River and White River National Wildlife Refuges, seven state wildlife management areas, a Nature Conservancy preserve, and many forested tracts held by private landowners. The public lands in the Big Woods have been designated as "Wetlands of International Importance" by the Ramsar Convention. Numerous public and private initiatives are working in the Basin to conserve, restore, expand and connect the forested wetlands and river corridors.

The White River Basin provides habitat for a huge variety of birds, mammals, and other terrestrial and aquatic species, including habitat for some 240 bird species. It is the #1

wintering area in North America for mallards; the endangered interior least tern and bald eagle nest here; and many neotropical migratory bird species use the forested wetlands as vital breeding grounds. The swallow-tailed kite was observed during breeding season in 1998 for the first time in 100 years. These forested wetlands also support a population of Arkansas's only native bears, for which tests are currently being conducted to determine if the population is the endangered Louisiana black bear (*Ursus americanus luteolus).*

In addition, more than 100 species of fish inhabit the White River Basin. The White River is one of a minority of rivers in the world where paddlefish spawn successfully, and the Basin supports one of the largest populations of paddlefish in the world. The river system also boasts the state's largest populations of shovelnose sturgeon and crappie, as well as important commercial fisheries of buffalo and catfish. Several species of endangered mussels also live here.

A massive Corps navigation project is being proposed for the White River that would increase the current 5 feet by 100 feet channel to 9 feet by 200 feet to accommodate barge traffic. The dredging project would cut through two National Wildlife Refuges and would benefit a very few business interests at the expense of the health of the White River ecosystem and its associated wetlands. Increased dredging would increase the entrenchment of the river, cutting it off from its floodplains, and further reducing fish spawning habitat and habitat for mussels and other aquatic species. The proposed project would lead to decreased water quality, increased flow rates, and other hydrologic modifications damaging to both in-stream and bottomland habitats.

Several other projects also threaten the White River and its surrounding ecosystem. Four Corps-assisted irrigation projects are being proposed which would remove water from the White River or its tributaries, potentially affecting water supply downstream. Water allocation plans are currently being developed for the Basin. These projects and water reallocations could greatly exacerbate current problems with upriver dams that are releasing water in unnatural pulses. In addition to the water projects, new highways and bridges are also being planned that could cut through existing forest lands, threatening birds -- such as the swallow-tailed kite -- and bears that need large expanses of unfragmented habitat.

Major questions exist about the cumulative impacts of all these projects on these "Wetlands of International Importance." A Comprehensive Study is needed of the White River Basin that will assess the entire ecosystem and the needs of both the people and wildlife that inhabit it. An equitable, compatible water-use management plan could then be developed. Any impacts to the basin's national wildlife refuges must also be found compatible with the management of these areas pursuant to the National Wildlife Refuge System Improvement Act of 1997.

The key to the future viability of this great ecosystem is a more natural hydrologic function. Current and future projects that impact the Lower White River should maintain and/or restore natural values. President Clinton, in his radio address on May 29, 1999, announced several initiatives to improve our nation's waters, including " . . . directing all

federal agencies to adopt a comprehensive strategy to better safeguard rivers and other bodies of water on federal lands." A comprehensive study is essential prior to moving forward with navigation or irrigation projects. We urge your support for a Comprehensive Study of the White River Basin.

Sincerely,

Evan Hirsche
Director, Wildlife Refuge Campaign
National Audubon Society

Nancy S. Delamar
Arkansas State Director and
Vice President
The Nature Conservancy

Robert Dewey
Director, Habitat Conservation
Defenders of Wildlife

Charles Clusen
Senior Policy Analyst
Natural Resources Defense Council

Steve Shimberg
Vice President for Federal and
International Affairs
National Wildlife Federation

Rollin D. Sparrowe
President
Wildlife Management Institute

David Tobin
President and CEO
National Wildlife Refuge Association

Jim R. Waltman
Director, Refuges and Wildlife
The Wilderness Society

cc: Hon. Carol M. Browner
Hon. Jamie Rappaport Clark
Hon. George T. Frampton
Hon. Bruce Babbitt
Hon. Michael L. Davis

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1500 Museum Road, Suite 105
Conway, Arkansas 72032

IN REPLY REFER TO:

June 11, 1999

Colonel Daniel W. Krueger
U.S. Army Corps of Engineers
167 North Main Street, Suite 590
Memphis, Tennessee 38103-1894

Dear Col. Krueger:

Recently several agencies have proposed a number of development activities in the White River basin. These proposals include flood control works, navigation projects, irrigation projects, bridge and highway projects, land acquisition for national wildlife refuges, reregulating reservoir releases, minimum stream flow determinations, and harbor development. A variety of federal and state agencies are examining the feasibility of these proposals. The large number of proposals and the number of different agencies working on them generates a concern over potential conflicts and unanticipated cumulative effects. The decisions made on these proposals will determine the quality of life, economic vitality, and environmental health of the basin well into the 21st century.

A comprehensive study of the economic, social, and environmental impacts of basin developments would be a valuable tool to guide decisions. Without this kind of coordinated approach, decisions could be based on an inadequate understanding of the interactions between actions which may superficially appear to be unrelated.

Attached is a proposed plan for a comprehensive study of the White River basin in Arkansas and Missouri. This document is intended to begin discussions. At this time our vision is that the study would be jointly managed by the Corps of Engineers and the Fish and Wildlife Service, with significant input from all interests in the basin.

A study of this magnitude would likely require a specific Congressional authorization, which is only possible if the study has the support of all interests in the basin. As a first step in generating a wide level of support for a comprehensive study, our agencies should reach basic agreement on the scope and magnitude of any study. At your earliest convenience I would like to initiate meetings between our offices to discuss policy issues, share past experiences with comprehensive studies in other basins, and refine the proposed plan of study.

Please contact me regarding a meeting schedule. I look forward to working with you and your staff in the important effort to develop the resources of the White River basin in a way that will provide continued economic strength and protect and enhance the internationally significant natural resources.

Sincerely,

Allan J. Mueller
Field Supervisor

cc: Arkansas Game and Fish Commission, Little Rock, AR
Attn: Scott Yaich
Missouri Department of Conservation, Jefferson City, MO
Environmental Protection Agency, Dallas, TX
Attn: Barbara Keeler
Corps of Engineers, Little Rock
Attn: Col. Thomas Holden
Fish and Wildlife Service
White River National Wildlife Refuge, DeWitt, AR
Cache River National Wildlife Refuge, Augusta, AR
Steve Thompson, Atlanta, GA
Keith Taniguchi, Atlanta, GA
Columbia Field Office, Columbia, MO
Greers Ferry National Fish Hatchery, Heber Springs, AR
Mammoth Spring National Fish Hatchery, Mammoth Spring, AR
Norfork National Fish Hatchery, Mountain Home, AR
Arkansas Natural Heritage Commission
Attn: Tom Foti

E+C
Reg.
Planning
Ops.
Memphis
LMVD
SWD

Little Rock District
Arkansas Democrat Gazette
June 30, 2000

Arkansas Democrat Gazette

House OKs $300,000 for White River study

Environmental groups oppose navigation project

BY KIM McGUIRE
ARKANSAS DEMOCRAT-GAZETTE

The U.S. House of Representatives, by approving $300,000 in funding for the White River Navigation Project study, has taken the issue one small step forward, much to the dismay of local conservation groups.

The House voted overwhelmingly early Wednesday to approve the appropriations bill containing the funding. It will now be sent to a Senate committee for consideration.

"The Arkansas Wildlife Federation is extremely disappointed that the House would appropriate $300,000 for the White River Navigation Project Study," Terry Horgan, executive director of the group, said Thursday. "We see this appropriation as a total waste of public funds because this project is not needed. It will damage the lower White River, and only a very few people want it done."

The appropriation still leaves a $286,000 funding gap to complete the U.S. Army Corps of Engineers' study, which is now estimated to cost about $2.3 million and is about three-fourths complete.

Environmental groups believe cutting off funding for the study is the key to killing the project. They believe the project will destroy wetlands, threaten commercial mussel beds and reduce overbank flooding that aids in fish spawning.

Proponents of the project, however, say that it will be a boon to eastern Arkansas by providing reliable commercial navigation and lowering transportation costs for regional industry.

Commissioner Ralph McDonald of the Arkansas Waterways Commission, which supports the project, said he hopes that the study will receive full funding by the end of the year.

"Both sides of this issue need this study finished in order to have meaningful discussion about the project," McDonald said.

McDonald said that the cost of the study has increased because environmental groups have asked the Corps to look at issues not originally in the scope of the plan.

The project calls for installing wing dikes along the river's banks to direct currents to scour the river bottom and maintain a 9-foot depth 95 percent of the year. The project is intended to cost $30 million, but critics have argued that the price tag is swelling far beyond that amount.

In March the Washington D.C.-based group American Rivers named the White River as one of the nation's top 10 most-endangered waterways.

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
CIVIL WORKS
108 ARMY PENTAGON
WASHINGTON DC 20310-0108

12 JUL 2000

REPLY TO
ATTENTION OF

Mr. Richard Bishop
Chair
Mississippi Flyway Council
Iowa Department of Natural Resources
Wallace State Office Building
Des Moines, Iowa 50319

Dear Mr. Bishop:

This responds to your letter of April 18, 2000, stressing the importance of the White River Basin, Arkansas, and the need for a comprehensive, basin-wide evaluation of the potential cumulative impacts of projects in the basin. You requested my position on these issues and the status of evaluation efforts.

I whole-heartedly agree that the White River Basin is a unique and important ecosystem. I concur that the basin contains important habitats that are critically important as a wintering area for waterfowl. We included funds in the President's Fiscal Year 2001 budget for the Army Corps of Engineers to initiate a comprehensive study of the White River Basin. This study will identify both the water resources needs of the area and possible solutions to those needs, and will also provide the opportunity to examine the existing conditions of the White River and determine important ecosystem functions and processes. This analysis will also include an evaluation of the potential cumulative impacts of proposed projects. The study will identify options to protect and restore the White River Basin and its wetlands, including the bottomland hardwoods that are so important to this area. The study would be conducted under the authority of Section 729 of the Water Resources Development Act of 1986, and assuming that funds are provided, would be initiated by the end of 2000.

I trust that this information meets your needs. Please do not hesitate to contact me if I can be of further assistance.

Sincerely,

Joseph W. Westphal
Assistant Secretary of the Army
(Civil Works)

CF: CRC
CECW-PC
CEMVD-PM-E
CEMVM-PM
SACW (FILE, READ, SIGN)
Prepared: FITZSIMMMONS/761-1974/22 MAY 2000
Revised: Jim Smyth/SACW/JUN9 2000
J:Shared/Smyth/Mr. R. Bishop,WhiteRvr.ARK
23 Jun 2000
SA#0042702

MISSISSIPPI FLYWAY COUNCIL

Iowa Dept. of Natural Resources
Wallace State Office Bldg.
Des Moines, IA 50319

April 18, 2000

Dr. Joseph W. Westphal
Asst. Sec. Of Army (Civil Works)
U.S. Army Corp of Engineers
108 Pentagon
Washington, D.C. 20310

Dear Dr. Westphal

In August, 1999, I wrote you on behalf of the Mississippi Flyway Council to express the Council's concerns about possible impacts that developments in the White River Basin of Arkansas could have on critical wetland habitats in that region. The proposed projects included flood control, irrigation, navigation, bridge and highway and harbor development. In addition, re-regulation of reservoir releases, minimum stream flow determinations, and water allocation plans were being explored.

The lower White River Basin contains wetlands of regional, national, and international importance. It is one of the most important areas in the Mississippi Flyway for wintering waterfowl. The basin also provides critical habitat for many other wetland-wildlife species. The productivity of this system is inextricably linked to the natural flood events that provide a wide diversity of habitats.

The Council believes a comprehensive, basin-wide evaluation of the potential cumulative impacts of the proposed projects is warranted and urged you to support this effort. To date, we have not heard if an evaluation has been initiated or if your agency even supports such an effort. We would appreciate knowing where you stand on this idea and what, if anything, has been done to evaluate the cumulative impacts of the proposed developments in the White River Basin.

Sincerely,

Richard Bishop, Chair
Mississippi Flyway Council

cc: Jamie Rappaport Clark, USFWS Director
Steve Wilson, AR Game & Fish
Col. Daniel W. Krueger, USCOE Memphis District
Arkansas Congressional Delegation
Mississippi Flyway Council
Ken Gamble, Service Flyway Rep.

MISSISSIPPI FLYWAY COUNCIL

Iowa Dept. of Natural Resources
Wallace State Office Bldg.
Des Moines, IA 50319

August 13, 1999

Dr. Joseph W. Westphal
Asst. Sec. Of Army (Civil Works)
U.S. Army Corp of Engineers
108 Pentagon
Washington, D.C. 20310

Dear Dr. Westphal

The Mississippi Flyway Council is a coalition of 14 states and three Canadian provinces that works in conjunction with the respective federal governments to manage migratory birds and their habitats in the heartland of North America. Mississippi Flyway Council states, cooperating with federal agencies and non-governmental partners, deliver most of the conservation programs for migratory birds in a significant portion of mid-America.

The Mississippi Flyway Council was recently informed of proposals for several development projects in the White River Basin, including flood control, irrigation, navigation, bridge and highway and harbor development projects. In addition, re-regulation of reservoir releases, minimum stream flow determinations, and water allocation plans are being explored. A variety of state and federal agencies are currently examining the feasibility and potential impacts of these projects.

The Mississippi Flyway Council is concerned with the potential impacts these projects could collectively have on the White River basin. The lower White River basin contains wetlands of regional, national, and international importance. It is one of the most important areas in the Mississippi Flyway for wintering waterfowl and contains the largest concentration of mallards in North America. The basin also provides critical habitat for many other wetland dependent wildlife species. The productivity of this system is inextricably linked to the natural flood events that provide the diversity of habitats required by waterfowl and the other species that depend on this habitat.

We believe comprehensive, basin-wide evaluation of the potential cumulative impacts of these proposed projects is warranted. This evaluation would be an invaluable planning tool to help guide future development in the White River basin and would have the full support of state and

regional conservation organizations. An evaluation of this scope could possibly require specific congressional authorization. We urge your support in this effort.

Sincerely,

Richard Bishop, Chair
Mississippi Flyway Council

cc Jamie Rappaport Clark, USFWS Director
Steve Wilson, AR Game & Fish
Col. Daniel W. Krueger, USCOE Memphis District
Allen Mueller, FWS ES
Arkansas Congressional Delegation
Mississippi Flyway Council members
Ken Gamble, Service Flyway Rep.

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

13 JUL

REPLY TO
ATTENTION OF

Planning Division
Program Management Branch

Ms. Ina Mitchell
22301 Cass Avenue
Woodland Hills, California 91364

Dear Ms. Mitchell

Thank you for your recent message to President Clinton concerning potential plans by the U.S. Army Corps of Engineers that may impact the refuges along the White River, Arkansas. Your message was referred to me for a response because I oversee the planning of Corps projects.

We share your concerns for this Nation's water resources. To ensure that our planning process will produce projects that best serve the Nation, the President approved the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G) in 1983. All project proposals are formulated and evaluated in accordance with the P&G. The P&G are intended to ensure proper and consistent planning of water resources projects and enhance our ability to identify and recommend economically feasible and environmentally sound alternatives. Also, Executive Order 11990, Protection of Wetlands, requires project plans to minimize the destruction, loss, and degradation of wetlands. It directs us to avoid new construction in wetlands and to provide for public review of all plans for construction in wetlands. These and other laws and policies, particularly the National Environmental Policy Act (NEPA), call for us to develop alternatives that are sensitive to many different competing interests and desires, and to subject these alternatives to public scrutiny before selecting a plan for recommendation. To further ensure that each recommended plan will best serve the Nation, we subject the supporting analyses to stringent technical and policy reviews before forwarding the recommendation to the Administration and Congress for a final decision. We are following this process in our study of navigation needs on the White River and will fully comply with the P&G, NEPA, and all other applicable laws and policies.

The White River to Batesville, Arkansas, is a congressionally authorized navigable waterway that the Corps currently maintains between an 8-foot and 4.5-foot minimum depth, depending upon location. Each year, we dredge the navigation channel in areas where sediment builds up. Congress, in the Water Resources Development Act of 1996, re-authorized construction of a 200-foot wide and 9-foot deep navigation channel project that would extend from the Arkansas Post Canal (river mile 10) to Newport, Arkansas (river mile 254). Our Memphis District is now conducting the White River Navigation

Study to reevaluate the feasibility of the re-authorized project. The study is addressing the needs for improving navigation as well as protecting or enhancing the environment.

Meetings to define and refine the project scope have been held with local interest groups, and state and federal agencies. The study is addressing the concerns raised in those meetings, including environmental concerns. Also, we have expended considerable manpower and resources to evaluate the existing river ecosystem in an effort to assure that any recommended plans will be environmentally sound. This effort is presently incomplete. All interested parties will be given an opportunity to comment on the draft feasibility report and the draft Supplemental Environmental Impact Statement in about six months. No decision will be made to implement a project until the public, State, and interagency reviews are completed. If the report is favorable, Congress would then have to appropriate funding to initiate construction.

Please be assured that our planning efforts adhere to the applicable laws and policies to ensure that all project proposals, including those along the White River, are environmentally sound. We appreciate your views and concerns, and we will give them full consideration in our planning process.

Sincerely,

Rennie H. Sherman
Acting Chief, Planning Division
Office of Deputy Commanding General
for Civil Works

OSA, WHLO RM 3D656
CECW-P, CECW-ZD TS0062801
CEMVD-PM-E
CEMVM-PM

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF

Planning Division
Program Management Branch

Mr. W. E. Kuster
1034 Memory Lane
Escondido, California 92026-1722

Dear Mr. Kuster:

Thank you for your recent message to President Clinton concerning potential plans by the U.S. Army Corps of Engineers that may impact the refuges along the White River, Arkansas. Your message was referred to me for a response because I oversee the planning of Corps projects.

We share your concerns for this Nation's water resources. To ensure that our planning process will produce projects that best serve the Nation, the President approved the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G) in 1983. All project proposals are formulated and evaluated in accordance with the P&G. The P&G are intended to ensure proper and consistent planning of water resources projects and enhance our ability to identify and recommend economically feasible and environmentally sound alternatives. Also, Executive Order 11990, Protection of Wetlands, requires project plans to minimize the destruction, loss, and degradation of wetlands. It directs us to avoid new construction in wetlands and to provide for public review of all plans for construction in wetlands. These and other laws and policies, particularly the National Environmental Policy Act (NEPA), call for us to develop alternatives that are sensitive to many different competing interests and desires, and to subject these alternatives to public scrutiny before selecting a plan for recommendation. To further ensure that each recommended plan will best serve the Nation, we subject the supporting analyses to stringent technical and policy reviews before forwarding the recommendation to the Administration and Congress for a final decision. We are following this process in our study of navigation needs on the White River and will fully comply with the P&G, NEPA, and all other applicable laws and policies.

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Jim Dotson

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Sincerely,

Rennie H. Sherman

Rennie H. Sherman
Acting Chief, Planning Division
Office of Deputy Commanding General
for Civil Works

OSA, WHLO RM3D656
CECW-P, CECW-ZD, TS0062804
CEMVD-PM-E
CEMVM-PM

[redacted]

Subject: White River Comprehensive Study
Date: Fri, 14 Jul 2000 11:57:36 -0500
From: "David Carruth" <dcarruth@futura.net>
To: "Adam Harris" <chamber@tcac.net>, "Alan Perkins" <aperkins@hgpw.com>,
"Allan Mueller" <allan_mueller@fws.gov>,
"Allen Maxwell" <Allen.Maxwell@mail.house.gov>, <ben_noble@lincoln.senate.gov>,
"Bill Pettit" <troutman@neark.net>, <billreed@riceland.com>,
"Dennis Widner" <dennis_widner@fws.gov>, "Don McKenzie" <wmidm@ipa.net>,
"F. G. Courtney" <Courtney@nwf.org>, "Gary Rogers" <grogers@doverdixon.com>,
"Greg Yeatman" <gly@yeatman.com>, "Hank & Cathy Brown" <catsbluff@aol.com>,
<jeb.joyce@mail.house.gov>, "Jeff Stein" <Jeff@taxpayer.net>,
"Jerry Lee Bogard" <jlb@hugit.net>, "Jesse Grantham" <jesse_grantham@centurytel.net>,
"Jim Rankin" <jrankin@catlaw.com>, "Jim Wood" <jrmiajim@arkwest.com>,
"Joe Krystofik" <Joe.Krystofik@fws.gov>

Please read the following article that appeared in today's Arkansas Democrat Gazette: http://www.ardemgaz.com/today/ark/A1xtroutf14.html This is **EXACTLY** why we need a comprehensive study of the White River. This article reflects that the users of the upper White are concerned about (1) lake levels on Bull Shoals lake (Undoubtedly, users of Beaver, Tablerock and Norfork will also share their concern), (2) SWEPCO is concerned about having water to generate electricity and (3) the trout industry is concerned about the water temperature. These are but three of the multiple interests when it comes to use of the White River. This debate does not, however, include the following:

1. Farmers downstream (beginning at Batesville) and their concern about flood control. While I am not saying that a release to placate the trout industry would flood farms, it is clear that the interests of the trout industry, big lake recreation and SWEPCO do not include this factor.

2. It does not address the issue of irrigation water withdrawal

3. It does not address navigation

4. It does not take into account the effect discharge of cold water will have on the lower White which is populated by aquatic specie that are not cold water tolerant.

5. It does not take into account recreational uses of the Lower White.

6. It does not consider waterfowl.

Those of us who live on the lower White have become more and more concerned over the past 15 years that from Batesville south was simply considered the discharge pipe for the big lakes and trout industry. Ironically, trout are not indigenous to the White and were introduced after the dams were built. Man has vastly changed the character of the upper White from its original state. This is all fine and good except no consideration seems to be given to the decimation this has caused to certain aspects of the lower White such as the commercial fishing industry.

am not calling for nor am I attacking the trout industry. What I am saying is that

management of the White is almost a hodge podge of ad hoc decisions between the Lower White and Upper White. Release of cold water from the dams whether for the trout industry or to generate electricity effects the lower White by dumping cold water on us. This, in turn, changes the nature of the river from a warm water habitat to a cold water one. Just as the trout cannot tolerate warm water, catfish, bass, crappie, bream, gar, etc. cannot tolerate cold water. The long term effect of this has been the loss to Clarendon and the lower White of a vast commercial fishing industry. Literally trainloads of fish used to leave Clarendon for the north and northeast. Now less than five people even fish commercially and they only supplement their income.

This is but one example of how one project (flood control) on the upper White has had a dramatic impact on the rest of the river. Now, we are embroiled in a discussion about a navigation project, a several irrigation projects, electric generation, big lake recreation and trout fishing. Without a comprehensive study to balance the competing interests, we can slowly but surely render the river useless for all purposes, including its original purpose.

Who amoung our leaders will lead?

David Carruth

DEPARTMENT OF THE ARMY
VICKSBURG DISTRICT, CORPS OF ENGINEERS
4155 CLAY STREET
VICKSBURG, MISSISSIPPI 39180-5435
http://www.mvk.usace.army.mil/

REPLY TO ATTENTION OF:

CEMVK-DE (420-74j)

18 July 2000

MEMORANDUM FOR CDR, CESWL, Post Office Box 867, Little Rock AR 72203-0867

SUBJECT: Request for Comprehensive Study of the White River Basin in Arkansas

1. Reference is made to the enclosed letter from Dr Jim Bednarz, Arkansas State University, SAB (encl 1

2. Since the White River Basin is not under my jurisdiction, I am forwarding the letter to you for response. Dr. Bednarz has been advised of this action.

3. If I may be of further assistance, please contact me.

Encl

ROBERT CREAR
Colonel, Corps of Engineers
Commanding

OPTIONAL FORM 99 (7-90)
FAX TRANSMITTAL # of pages ▶ 3
To Jim Bodron From Brenda Paloma
Dept./Agency Phone #
Fax # Fax #
NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

Printed on Recycled Paper

THE WILDLIFE SOCIETY
ARKANSAS CHAPTER

22 June 2000

Col. Robert Crear
U.S. Army Corps of Engineers
Vicksburg District
4155 Clay Street
Vicksburg, MS 39180

Dear Colonel Crear:

Enclosed is a resolution urging a comprehensive study of the White River Basin within Arkansas and Missouri that was originally passed by the Arkansas Chapter of the Wildlife Society (ACTWS) in October 1999. The Executive Committee of the ACTWS was given authority by the membership to refine the resolution as appropriate, which was completed and approved in May 2000.

The ACTWS is the primary organization that represents professional wildlife biologists employed by federal and state governmental agencies, private industry, and universities throughout Arkansas. We are very concerned about the ecological integrity of the White River system, perhaps, one of the most unique ecosystems occurring in our state. We urge you to promote the undertaking of an objective and comprehensive study on the cumulative impacts of all pending and potential projects affecting the White River Basin.

Conservation and wise stewardship of this unique resource will benefit all Arkansans and users of this system for many centuries into the future.

Thank you for considering our input.

Sincerely,

Jim Bednarz, Ph.D.
President, ACTWS

P.O. Box 599
Dept. of Biological Sciences, ASU
State University, AR 72467
(870) 972-3082

RECEIVED IN CELMK-OD
00 JUN 28 AM 10:51

RESOLUTION URGING A COMPREHENSIVE STUDY OF THE WHITE RIVER BASIN WITHIN ARKANSAS and MISSOURI

WHEREAS, land use within the entire White River basin covers more than 27,765 square miles and

WHEREAS, the White River basin is one of the most important bottomland hardwood wetland areas in the world and is designated as a Ramsar Wetland of National Importance, and

WHEREAS, the streams and wetlands of the White River basin overwinter the largest concentration of mallards in North America, and

WHEREAS, the lower White River basin is home to the only remnant population of black bear in the Mississippi Alluvial Valley, and

WHEREAS, the White River basin provides habitat for many Neotropical migratory birds of special concern, and

WHEREAS, the associated drainages and streams of the White River Basin support several populations of endangered mussels, and

WHEREAS, the White River basin supports a valuable riverine fishery which includes sturgeon and paddlefish, and

WHEREAS, the White River basin supports many uses including; agriculture water supplies, hydroelectric generation, commercial navigation, fish and wildlife conservation, recreational and commercial fishing, waterfowl and other hunting, commercial shelling, and recreational boating, and

WHEREAS, several management proposals are currently under consideration for the White River basin including; the white river navigation project, four agriculture irrigation projects, low water allocation planning, modifying reservoir release operating plans, and extensive reforestation as defined by the Mississippi Alluvial Valley Migratory Bird Conservation Plan, and

WHEREAS, a comprehensive study to provide a basis for sound management decisions is proposed for the entire White River basin on the potential benefits and conflicts associated with the many uses and proposals;

NOW THEREFORE BE IT RESOLVED, that the Arkansas Chapter of The Wildlife Society, on 7 October, 1999, at the annual fall meeting held on the Arkansas Tech University Campus in Russellville, Arkansas; strongly urge the U.S. Army Corps of Engineers to initiate a comprehensive study of the entire White River basin and look at the cumulative impacts of all pending and potential projects, and

FURTHERMORE, copies of this resolution will be sent to the U.S. Army Corps of Engineers, the Secretary of the Interior, the Arkansas Congressional Delegation, Governor Mike Huckabee, the U.S. Fish and Wildlife Service, and the Arkansas Game and Fish Commission.

James C. Bednarz

President,
Arkansas Chapter of The Wildlife Society

APPENDIX 14
ORIGINAL PROJECT STUDY PLAN (PSP)

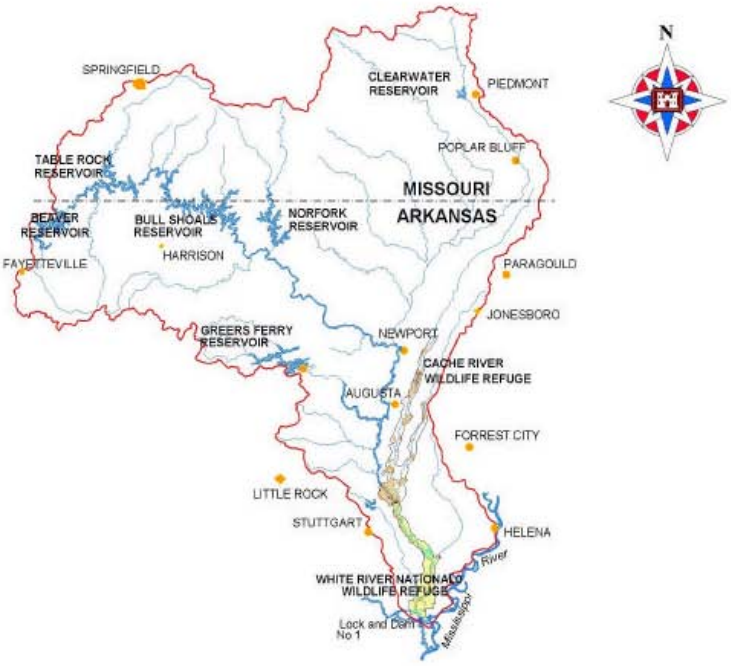
US Army Corps
of Engineers
Memphis District

White River Basin-Wide Comprehensive Study

A Section 729 of WRDA 1986 Study

Project Study Plan

October 2001



White River Basin, AR & MO

PROJECT STUDY PLAN COORDINATION

White River Basin Comprehensive Study

This plan has been prepared in accordance with, ER 1105-2-100: "Guidance for Conducting Civil Works Planning Studies", dated April 22, 2000; ER 5-1-11: "Management - USACE Business Process", dated August 17, 2001; ER 1110-2-1150: "Engineering and Design for Civil Works Projects"; ER 405-1-12, "Chapter 12, Real Estate Handbook", dated May 15, 2000; and ER 1105-2-101: "Risk-Based Analysis for Evaluation of Hydrology/Hydraulics, Geotechnical Stability, Economics in Flood Damage Reduction Studies" dated March 1, 1996.

Presented for Approval by:	James A. Bodron, P.E.	28 Sep 01 Date
Approved by District PRB:	Robert L. Tisdale, P.E. DPM, Chairman	31 Oct 01 Date
District Engineer	Colonel Jack V. Scherer	31 Oct 01 Date
Deputy District Engineer	Major Todd A. Gile	2 NOV 01 Date
Chief, Engineering Division	Dennis Kamper, P.E.	1 Oct 01 Date
Chief, Construction-Operations Division	Robert D. Cash, P.E.	9 Oct 01 Date

Acting Chief, Resource Management Division — Jim A. Hayes — 2 Oct 01 — Date

Chief, Contracting Division — Glenda C. Tackett — 3 Oct 01 — Date

Chief, Real Estate Division — Harris T. Vandergriff — Sept 28, 200 — Date

District Counsel — David E. Sirmans — 3 Oct 01 — Date

CERTIFICATION OF LEGAL REVIEW

The Project Study Plan for the White River Basin Comprehensive Study has been fully reviewed by the Office of Counsel, Memphis District, and is approved as legally sufficient.

30 Oct 01
Date

DAVID E. SIRMANS
District Counsel

PROJECT STUDY PLAN COORDINATION

White River Basin Comprehensive Study

The Project Study Plan has been prepared in accordance with, ER 1105-2-100: "Guidance for Conducting Civil Works Planning Studies", dated April 22, 2000; ER 5-1-11: "Management - USACE Business Process", dated August 17, 2001; ER 1110-2-1150: "Engineering and Design for Civil Works Projects"; ER 405-1-12, "Chapter 12, Real Estate Handbook", dated May 15, 2000; and ER 1105-2-101: "Risk-Based Analysis for Evaluation of Hydrology/Hydraulics, Geotechnical Stability, Economics in Flood Damage Reduction Studies" dated March 1, 1996.

K. G. Williams

Ken G. Williams
Chief
Project Management Branch

8-22-01
Date

Billy D. Gibson

Billy D. Gibson
Chief
Acquisition Branch

9/28/01
Date

Edward E. Belk
Assistant Chief
Planning, Programs, and Project
Management Division

Date

Dewey L. Jones PE

Dewey L. Jones
Chief
Hydraulics Branch

9-11-01
Date

David L. Reece
Chief
Environmental and
Economic Analysis Branch

9-5-01
Date

Hubert H. Logan

Hubert H. Logan
Chief
Civil Design Branch

5 Sept 01
Date

White River Basin-Wide Comprehensive Study

Project Study Plan

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Table of Contents Continued

WHITE RIVER BASIN COMPREHENSIVE STUDY PLAN

Introduction

This document outlines the Project Study Plan (PSP) prepared to describe the study effort and provide a detailed time and cost estimate for the White River Comprehensive Study. The purpose of the basin wide study is to identify problems and opportunities and propose solutions to water resources related land problems in the White River Basin. The U.S. Army Corps of Engineers, an interagency planning team, and prospective local sponsors have developed this PSP as a cooperative effort.

The purpose of the PSP is to describe the scope, schedule, and budget for accomplishing the basin wide study. This document also includes:

- A critical path method (CPM) network diagram that shows the logic and interrelationships of tasks;
- A detailed project schedule (Gannt chart);
- Cost summary tables;
- Detailed work task descriptions and a work breakdown structure;
- The division of responsibilities to be accomplished during the study by the Corps of Engineers and the non-Federal sponsor;
- A Quality Control/Internal Technical Review Plan; and
- A strategic communication plan.

The PSP will serve as a basis for the Cost Sharing Agreement (CSA) that will be negotiated between the Corps of Engineers Districts and the non-Federal sponsor or sponsors.

Study Authorization and Purpose

A. The White River Basin Comprehensive Study is being carried out under the Corps of Engineers' General Investigations (GI) Program. This Section 905(b) Analysis was prepared as an initial response to Section 729 of the Water Resources Development Act (WRDA) of 1986, as modified by Section 202 of WRDA 2000, which reads as follows:

"SEC. 202. WATERSHED RIVER BASIN ASSESSMENTS.
Section 729 of the Water Resources Development Act of 1986 (100 Stat. 4164) is amended to read as follows:

SEC. 729. WATERSHED AND RIVER BASIN ASSESSMENTS.

(a) IN GENERAL. ---The Secretary may assess the water resources needs of river basins and watersheds of the United States, including needs relating to-
  (1) ecosystem protection and restoration;
  (2) flood damage reduction;

(3) navigation and ports;
(4) watershed protection;
(5) water supply; and
(6) drought preparedness.

(b) COOPERATION. --- An assessment under this subsection (a) shall be carried out in cooperation and coordination with-
(1) the Secretary of the Interior;
(2) the Secretary of Agriculture;
(3) the Secretary of Commerce;
(4) the Administrator of the Environmental Protection Agency; and
(5) the heads of other appropriate agencies.

(c) CONSULTATION. --- In carrying out an assessment under subsection (a), the Secretary shall consult with Federal, tribal, State, interstate, and local government entities.

(d) PRIORITY RIVER BASINS AND WATERSHEDS. --- In selecting river basins and watersheds for assessment under this section, the Secretary shall give priority to ---
(1) the Delaware River basin;
(2) the Kentucky River basin;
(3) the Potomac River basin;
(4) the Susquehanna River basin; and
(5) the Williamett River basin.

(e) ACCEPTANCE OF CONTRIBUTIONS. --- In carrying out an assessment under subsection (a), the Secretary may accept contributions, in cash or in kind, from Federal, tribal, State, interstate, and local governmental entities to the extent that the Secretary determines that the contributions will facilitate completion of the assessment.

(f) COST-SHARING REQUIREMENTS.---
(1) NON-FEDERAL SHARE.---The non-Federal share of the cost of an assessment carried out under this section shall be 50 percent.
(2) CREDIT.---

(A) IN GENERAL.--- Subject to subparagraph (B), the Secretary may credit toward the non-Federal share of an assessment under this section the cost of services, materials, supplies, or other in-kind contributions provided by the non-Federal interests for assessment.

(B) MAXIMUM AMOUNT OF CREDIT.--- The credit under subparagraph (A) may not exceed an amount equal to 25 percent of the costs of the assessment.

(g) AUTHORIZATION OF APPROPRIATIONS.--- There is authorized to be appropriated to carry out this section $15,000,000."

B. Funds in the amount of $375,000 were allocated in Fiscal Year 2001 to conduct the reconnaissance phase of the study.

C. The study purpose is to determine if there is a Federal interest in providing solutions to a full spectrum of water resource related problems and opportunities in the White River Basin, such as ecosystem restoration, navigation, flood damage reduction, agricultural and municipal water supply, waste water treatment, aquifer protection, water quality improvement, waterfowl management, and aquatic and wildlife habitat restoration. The problems and potential solutions will be examined in a comprehensive manner because of the interrelationships of the problems and potential solutions to all of the significant resources in the basin.

D. A previous USACE-associated basin study for the White River was authorized by the Committee on Public Works, United States Senate, May 11, 1962. It is reported in the *Comprehensive Basin Study, White River Basin, Missouri and Arkansas*, 1968, White River Basin Coordinating Committee.

Reconnaissance of Area

This section is intended to provide an overview of the problems and needs in the study area. The previous knowledge of the problems and opportunities was used in development of the scope of studies to ensure that the proper investigations were considered for the estimate.

1) Study Area Description

The White River basin comprises approximately 27,765 square miles, of which 10,622 square miles are in the southern part of Missouri and the remaining 17,143 square miles are in northern and eastern Arkansas. The White River basin contains 5 large Corps multi-purpose lakes: Beaver, Table Rock, Bull Shoals, Norfork, and Greers Ferry. Clearwater Lake is also operated by the Little Rock District Corps of Engineers; however, it is a smaller lake primarily used for flood control. The White River basin includes over 150 miles of flood control levees along the White River and its tributaries.

Interest in the basin includes flood control, water supply, hydropower, navigation and other modes of transportation, environmental restoration and protection, and recreation. Portions of the White River basin are Federal lands associated with the USDA Forest Service and/or the Department of Interior. The lower portion of the basin is significant as a migratory waterfowl wintering area and includes several Federal wildlife refuges and state management areas that comprise one of the largest remaining areas of bottomland hardwood forest in the Mississippi Valley.

The White River Basin is comprised of the following congressional districts: Berry, AR-01; Snyder, AR-02; Hutchinson, AR-3; Ross, AR-04; Skelton, MO-04; Blunt, MO-07; Emerson, MO-08.

2) Natural Ecosystem, Existing, and Future Conditions Overview

Historically the basin's natural ecosystem condition was primarily forested. The construction of the Corps lakes for flood control resulted in water related recreation in the upper basin or mountain area. Tailwater trout fishing has become a major industry in the upper basin below the lakes. The population of northwest Arkansas and southwest Missouri has increased greatly over the years. Animal feeding operations have become very numerous in the upper basin and contribute greatly to the local economy. Most of the economy in the lower basin revolves

around agriculture. In order to move commodities to market, the use of barges has become very important. The White River is seasonally navigable for approximately 255 miles.

The Corps lakes in the upper basin and construction of levees in the lower basin have provided flood control for the basin. These lakes also provide recreation, hydropower, and water supply for the upper basin area. The lakes provide a very unique environment for enhancing fish and wildlife values in the basin. Much of the historically bottomland forested areas in the basin were cleared and farmed for agricultural production. However, the lower end of the White River has one of the largest remaining tracts of seasonally flooded bottomland hardwoods left in the Mississippi Alluvial Valley.

3) Problems and Opportunities Overview

The problems and opportunities in the basin were examined to develop a scope of studies to identify and determine their extent. One of the first problems is developing a complete understanding of the interactions of the significant water uses and resources in the basin as changes in the uses and resources occur. Once an overall understanding of the interactions is gained, the problems could be divided into the upper basin and the lower basin because of the significant geographic differences.

Upper basin problems – Rapid population growth and development are increasing the amount of municipal and industrial water use and wastewater generated. While increased water needs, increased wastewater discharge, and agricultural uses are contributing to decreased water quality, the capability of the water resources to sustain these loading increases is not known. Studies are needed to determine the effects of the increased runoff on the ecosystem and to determine if the problems will affect the lakes and water based recreation in the future.

Lower basin problems – In the lower basin, much of the previously forested area has been converted to cropland. The Alluvial and Sparta aquifers are being depleted in some areas. The counties suffer from the problems common to the Mississippi Delta and some have lost population in recent years. The lower portion of the river is seasonally navigable, but during low flows, shipments must be diverted to other ports. Water quantity has become a major concern since flows in the river are controlled and water is being used for a variety of purposes. In contrast to the upper basin, the primary concerns expressed in the lower basin relate to water quantity, not quality. The wetlands in the lower basin are not only nationally significant, but are also recognized internationally. Studies are necessary to identify the effects that current and future flow regimes could have on wetlands.

Study Conduct

The primary objectives of the study are to comprehensively analyze the basin problems and opportunities, find possible solutions to these needs, and recommend a course of action if a Federal interest is found. In order to accomplish this, the significant resources in the basin will be identified. A conceptual "model" will be developed to describe the interrelationships of the significant resources in the basin. The existing conditions of the resources will be examined and projections made of the future conditions of the resources in the absence of any additional projects beyond those currently authorized for construction. For ecosystem related resources, the natural ecosystem conditions focused on a pre-1800s context will be examined. The natural ecosystem conditions will be used to determine the conditions that contributed to the value of the

significant resources. Examining the current, future, and natural ecosystem conditions will lead to the determination of the water resources related problems and opportunities of the basin. When the examination of the existing, future without project, and natural ecosystem conditions are completed for the significant resources, this model will then aid in determining the comprehensive set of water resources related problems and opportunities.

Review of Prior and Ongoing Studies and Reports

The White River Basin has been recognized for the importance of its resources to the States of Arkansas and Missouri and the nation and a corresponding large number of studies or projects have been completed and are underway in the basin. The comprehensive study will not halt other ongoing Corps of Engineers efforts in the basin. Information will be exchanged with the study efforts to capitalize on the synergism of the work efforts.

Prior reports in the White River watershed are too numerous to list. Completed or on-going projects in the Little Rock District include: Beaver Lake, Arkansas; Bell Foley Lake, Arkansas; Black River at Highway 69 Bridge, Arkansas; Bull Shoals, Arkansas; Clearwater Lake, Missouri; Table Rock Lake, Missouri; Greers Ferry Lake, Arkansas; Hurricane Lake Wildlife Management Area, Arkansas; Little Red River Agricultural Water Supply, Arkansas; Lake Taneycomo, Missouri; and White River Minimum Flows, Arkansas and Missouri. Memphis District projects and studies include: Grand Prairie Area Demonstration Project, Arkansas; White River Navigation, Arkansas; Boydsville, Arkansas; Little Red River, Arkansas; and White River Maintenance, Augusta to DeValls Bluff, Arkansas.

Comprehensive studies will complement the water resource planning activities currently underway. Information available from these prior studies will be reviewed and utilized as appropriate.

Basin Conceptual Model

A conceptual model will be developed to attempt to describe the interrelationships of the various significant resources. This model will be descriptive and likely diagram various functions and processes in the basin. This will serve as a guide in determining the completeness of the studies and allow information gaps to be filled prior to completing studies.

Existing Conditions

The "existing conditions" for the various significant resources will be examined through the study. The level of detail will be determined for each significant resource as appropriate. During the study, one or more units of measure will be determined for each significant resource in the basin. These units of measure will likely be determined based upon some measurable and describable effect on the resource.

Future Without Project Conditions

The future without project conditions for the significant resources will be examined to aid in the determination of problems and needs of the basin. Trends will be identified that relate to

significant resources and predicting future conditions. Population, energy demand, water supply, and conditions of the aquifers will be among the many areas the study will examine.

Natural Ecosystem Conditions

For nationally significant ecosystem resources, projections will be made of the ecosystem values and functions associated with a pre-1800s context. These projections will aid in determination of the problems and opportunities and serve as restoration targets.

Compilation of Problems and Opportunities

The water resources related problems, needs, and opportunities of the basin would be examined in a comprehensive and holistic manner. The conceptual model will be reexamined to determine if the studies have captured the interrelationships of the various significant resources and processes affecting them. Existing, future without, and the natural ecosystem conditions, where appropriate, for each significant resource will be examined concurrently to determine problems and opportunities.

Formulation and Analyses of Alternatives

Alternatives will be formulated to address the problems and opportunities identified in the study. These alternatives will be examined to determine their effects on the significant resources.

Study Products

Studies conducted under Section 729 would not normally result in a report to Congress for authorizations, and the study time and cost estimates do not reflect processing a project report seeking authority for construction. However, each alternative will be examined for implementation authority. Many of the alternatives recommended for implementation under the comprehensive examination may be implemented under existing authorities, including the Continuing Authorities Program.

1) Projects that may be implemented under existing authority

Existing Corps authorities will be examined to determine if projects could be modified to implement measures recommended by the comprehensive study.

2) Projects that may be implemented under the Continuing Authorities Program

The Corps has several delegated authorities for projects meeting certain criteria. If projects are identified under the comprehensive study, use of these authorities may provide more rapid implementation of the measures. The authorities and requirements are summarized below.

a) Section 205 of the Flood Control Act of 1948 - This provides the same complete project and adequate degree of protection as would be provided under specific Congressional authorization.

b) Section 206 of the Water Resources Development Act of 1996 Aquatic Ecosystem - This provides for planning, design, and construction of aquatic ecosystem restoration and protection projects, when it is found that the project will improve the quality of the environment, is in the public interest and is cost effective.

c) Section 208 of the Flood Control Act of 1954 - Clearing and Snagging Projects. This allows for the removal of obstructions, including sediment from channels.

d) Section 1135 of the Water Resources Development Act of 1986 Fish and Wildlife Restoration - This provides for constructing environmental restoration projects where a Corps project contributed to the degradation of the environment.

e) Emergency Streambank and Shoreline Protection, Section 14 of the Flood Control Act of 1946 - This provides protection from streambank or shoreline erosion to public facilities by the construction or repair of protection works.

f) Section 107 of the River and Harbor Act of 1960 - Small Navigation Projects. This authorizes construction, operation and maintenance of small river and harbor improvement projects.

3) Comprehensive projects requiring further authorization by Congress

Alternative evaluation may yield needed projects to address the problems and opportunities that are beyond the scope of existing authorities and the continuing authorities program. Others will recommend potential solutions, outside the mission of the Corps, for implementation. The study will identify the necessary actions for implementation by the Corps and provide a time and cost estimate. Some possible examples would be an environmental corridor along the White River and major tributaries, and comprehensive wastewater treatment program to protect and restore aquatic ecosystems.

4) Evaluation tools for future use

The study will develop models that could be used by others in the evaluation of future actions. These tools could include a geographic information system, detailed water quality models of Beaver Lake, Table Rock Lake, and Lake Taneycomo, an overall basin model that would account for water quality, and other models that could be transferred to the sponsor at the conclusion of the study effort.

5) Comprehensive Study Report

The comprehensive report would present the results of the studies in a concise manner.

6) Significant Resources

The following is a list of significant resources and water uses in the basin that will be examined in the study.

1. Basin Ecosystem and uses relationships (a conceptual model)
2. Environmental Resources

a) Aquatic Ecosystem
   i) Upper Basin Streams
   ii) Lakes and Reservoir
   iii) Tailwater
   iv) Transition Zone
   v) Main Stem
   vi) Lower Tributaries
b) Terrestrial Ecosystem

3. Migratory Birds
4. Groundwater/Agriculture
5. Water supply/Wastewater
6. Recreation
7. Endangered Species
8. Navigation/Transportation
9. People and Economy
10. Hydropower/Power generation
11. Flood Control

The following describe assumptions, questions to be answered, and studies necessary to analyze these significant resources.

1. Basin Ecosystem and Uses Relationships (a conceptual model)

A conceptual model of the basin's ecosystems and uses will be developed that will include several models of how changes or uses in an area affects other areas. The interagency planning team will be involved in the development with the sponsor receiving credit for their participation. The Memphis District Corps of Engineers will be responsible for the model presentation and write-up.

2. Environmental Resources

(a) Aquatic Ecosystems

The aquatic ecosystems will be defined as the water body and its immediate area of influence including riparian zone and floodplain.

Various types or categories of aquatic ecosystems in the basin will be developed. These types will be categorized as follows: 1) Upper basin streams, 2) Lakes and Reservoirs, 3) Tailwaters, 4) Transition zone, 5) Main stem and oxbows, and 6) Lower tributaries. The key factors affecting the aquatic habitat would be determined including water quality, sediment loads, temperatures, water levels and flows, and other factors.

i. Upper Basin Streams

The upper basin streams will be examined to determine the degradation of the aquatic habitat. The same hydrologic unit codes as the U.S. Geological Survey will be used. These upper basin streams include a Wild and Scenic River and a National River. These streams include the James River, Crooked Creek, and the Strawberry River and other streams in the Ozark area and the Buffalo River as a National River. A sub-basin assessment will be performed to determine which

streams are experiencing losses in aquatic habitat. A method will be developed to translate the decreases in water quality and changes in the riparian zone into losses in aquatic habitat. The trends in development and population growth will be examined to determine likely changes in the aquatic habitat of the upper basin streams and the parameters affecting the habitat including water quality. The likely habitat that existed prior to the 1800s will be determined including water quality, sedimentation, stream corridors, and habitat values.

Watersheds contain aquatic, riparian, and wetland resources that include both physical and biological components. They provide critical habitat for wildlife and serve as important links between upland sites and streams by providing shade, bank stability, and filtration of pollution. Watersheds are dynamic systems that respond to disturbances by both human and natural agents. Disturbances can cause direct impacts such as flow reduction, wetland loss, and bank instability, or can produce indirect impacts in the uplands of a watershed, such as soil loss or small land failures that introduce sediment to the stream. These impacts are of concern to overall watershed health. They can affect water quality and quantity, fish and wildlife habitat and soil productivity.

Healthy watersheds are critical to protecting water quality, sustaining dependent ecosystems, providing a reliable water supply, and preventing or reducing the downstream impacts of high-runoff events. In a natural state, watersheds are in a dynamic equilibrium determined by geologic and climatic variables. Significant disturbances, whether caused naturally (e.g., landslides, stand-replacement forest fires, or floods) and/or by human impacts (e.g., roads, large-scale timber removal, or ground disturbance), can throw a watershed out of equilibrium. Often a watershed will recover from such disturbances with a balance of vegetation cover and stream flow. However, chronic impacts that severely impair watershed recovery can affect long-term health of watershed resources as well as their benefits to ecosystems and human settlements.

To facilitate assessment of watershed conditions and health, the White River Basin will be divided into smaller sub-basins. Factors, which are deemed significant, such as water temperature, nutrient levels, contaminants, and dissolved oxygen, will be quantified for each sub-basin and a condition and risk assessment (trend analysis) will be developed. Condition assessments will include a discussion of habitat and abiotic parameters and how they are or eventually may affect the aquatic ecosystem. Assessing watersheds at a finer scale will help to identify localized problems and facilitate development of solutions. An Interagency Working Group will focus the study on the factors and landscape parameters, which are most important.

ii. Lakes and Reservoirs

The lakes to be examined include the main flood control and multipurpose reservoirs in the basin. Historical conditions will be assumed to be the condition of the lakes when they were first filled. The relationship between population projections and development around the lakes and the use of these lakes for water supply will be examined during the study. Given that water quality is one of the main factors influencing the lakes, water quality parameters will be examined to determine their effects on the aquatic habitat of the lakes. Habitat suitability index for the Habitat Evaluation Procedure (HEP) model including water quality will be examined. Other models will be examined to find best fishery model to account for likely changes in conditions.

Beaver Lake – A detailed water quality model will be developed.
Table Rock Lake – A detailed water quality model will be developed

Bull Shoals Lake - Water quality trends and their effects on the aquatic ecosystem will be determined
Norfork Lake – Water quality trends and their effects on the aquatic ecosystem will be determined
Greers Ferry Lake – Water quality trends and their effects on the aquatic ecosystem will be determined
Clearwater – Water quality trends and their effects on the aquatic ecosystem will be determined
Taneycomo – A detailed water quality model will be developed

The objective of the studies on Beaver, Table Rock, and Taneycomo Lakes is to obtain the necessary information (temperature, nutrients, algae, and dissolved oxygen parameters) for use in calibrating a numerical model of hydrodynamics and water quality. The model will then be developed and used to predict water quality trends. Due to funding limitations, it was decided by the Interagency Planning Team that modeling on Bull Shoals, Norfork, Greers Ferry, and Clearwater Lakes would be postponed for a possible phase two if the desired interest develops by a potential sponsor.

Major potential outputs include benefits to aquatic resources through protecting and improving watersheds associated with lakes and reservoirs. Also potential environmental infrastructure improvements could enhance the quality of water entering the lakes. Improvements to the water quality of upper basin tributaries that enter into the lakes such as the James River would have a direct impact on the lakes themselves.

iii. Tailwaters

Minimum flow data will develop assessment techniques. Existing data will be examined to determine existing conditions and future trends. Problems and needs will be determined from this data.

iv. Transition Zone

The transition zone is the area of the main stem below the tailwaters where the river temperature is too warm for cold-water species but is not warm enough to be highly productive for warm water species. Existing data will be examined to determine existing conditions and future trends. Problems and needs will be determined from this data.

v. Main Stem

Existing data will be examined to determine existing conditions and future trends. Problems and needs will be determined from this data.

vi. Lower Tributaries

The lower basin tributaries are the tributaries that enter into the White River below the tailwaters. These include the Cache River, Bayou de View, Village Creek, Big Creek, and other streams. Existing data will be examined to determine existing conditions and future trends. Problems and needs will be determined from this data.

(b) Terrestrial Ecosystem

Ecosystem analyses will be conducted in the delta portion of the study area to include the watershed of the tributaries and main stem wetlands. A complete examination of the delta area will be conducted by major watershed to include ecosystem restoration options.

Existing data will be examined to determine existing conditions and future trends. Problems and needs will be determined from this data.

3. Migratory Birds

A literature search will be performed to identify historic and current conditions for neotropical migratory birds, waterfowl, and other migratory species to determine their population status within the basin. The current extent of habitat loss and degradation, and its affect on migratory bird populations will be determined. Future habitat and population trends will be projected, and migratory bird habitat improvement and restoration measures will be identified.

4. Groundwater-Agricultural Water Supply

Existing information will be used to examine the existing and future trends in ground water and agricultural water supply. A literature search will be performed in the upper basin to determine the relationship between the surface water quality and the danger of contamination of the aquifers due to the Karst topography. The study description of the aquifers and current water use will be examined. The draw on the aquifers for water use in the study area for agriculture, municipal, and industrial use will be examined. Potential threats to the aquifers from contamination will also be examined. The potential irrigation project in the area will be included in the future conditions. Existing groundwater models will be examined for inclusion in the basin-wide model.

5. Water Supply/Wastewater

Existing municipal and industrial water supply will be examined. Current wastewater treatment plants will be examined to determine their adequacy. The current effect of wastewater and pollution on the water supply will be examined. The project will predict, using population projections, the demands of the municipal and industrial water in the basin and the wastewater discharges. It will predict the water quality issues that threaten the lakes and identify possible solutions that can be investigated to determine its feasibility. Studies include examining population predictions to determine the demand of existing facilities and to determine the need for additional water supply and waste water treatment.

6. Recreation

A complete recreation analysis of the basin will be performed. Studies will include examining population predictions to determine the demand on existing facilities and to determine the need for additional facilities. The economic value of recreation will be computed.

7. Endangered Species

Existing data will be examined to determine existing conditions and future trends of Federally listed threatened and endangered species as well as state species of special concern. Problems and needs will be determined from this data. The existing endangered or threatened species (State and Federal) will be inventoried.

8. Navigation/Transportation Needs

The transportation needs of the basin will be examined to determine problems and opportunities. The majority of the effort will include incorporation of existing studies and data by others and the navigation studies to characterize the compete range of transportation needs in the basin including road, railroad, airport, and waterborne traffic. Projections of the future transportation needs will be gathered and related to the projections of future development and population growth. Transportation studies performed by the states' highway departments will be incorporated. An inventory of existing transportation facilities and uses will be included. Navigation data will be incorporated for existing studies including the number of tons that are being transported on the White River. Projections of future growth of these numbers will be made.

The effect of future transportation will be related to other significant resources and uses including fragmentation of forest due to bisecting roads or highways.

9. People and Economy

Examining the population and economic trends is essential in gaining an understanding of the likely future conditions and water resource problems and needs of the basin. Many of the current water resource related problems relate to economic and population growth in the basin. County population and economic trends for the existing and future without project conditions will be estimated using projections from existing data sources. Trends in agriculture and other sectors of the economy will also be examined.

10. Hydropower/Power Generation Needs

The existing power sources that use hydropower or the river for cooling will be inventoried. From existing literature sources, the power needs of the basin will be examined and existing water needs for power generation and cooling will be examined. Estimates from existing sources on the future power generation trends for hydropower/power generation in the basin will be examined. Estimates will be made on the long-term trends in the demand for power and the likelihood of adding additional power plants with associated water needs.

11. Flood Control Needs

Flooding in the basin will be examined to determine the flood control needs and opportunities including non-structural opportunities to reduce flooding and gain additional ecosystem restoration benefits. Work being done for the minimum flow study will be incorporated and expanded to develop a better understanding of the flood control needs and opportunities in the area immediately influenced by the reservoirs. In other areas in the basin, a literature search and existing information will be gathered to determine areas where flooding in the basin is occurring or likely to increase in the future.

Geographic Information System

The purpose of the geographic information system for the White River Comprehensive Study is to:

1. Compute land use/land cover information and present estimated future without project land use and modern historic land use – show state forestry projections
2. Support report preparation
3. Illustrate flooding conditions, current, future and historic
4. Illustrate sub-basin assessments
5. Present population data and growth estimates
6. Document existing and future without recreation facilities
7. Incorporate state and national forests and national river Land and Resource Management Plans
8. Known and potential migratory bird and wildlife corridors
9. Import state GIS database in our study. Highway department GIS data - Is it available?
10. Endangered species database
11. Aquatic Resources
12. Natural Heritage database info

SCOPE OF WORK

Specific Scopes of Work for the activities required to accomplish the feasibility study are presented in Appendix A. Activities are grouped according to the organization responsible for performing the task. A discussion of what, why, who, when, how, manpower/cost, and duration is presented for each activity.

WORK BREAKDOWN STRUCTURE

The Work Breakdown Structure (WBS) outlining the products and sub products for the feasibility study is presented in a hierarchy of levels in Appendix B. Each activity and product in the WBS can be cross-referenced with the Responsibility Assignment Matrix (RAM) in Appendix C.

ORGANIZATIONAL BREAKDOWN STRUCTURE

The Organizational Breakdown Structure (OBS), Appendix D, presents the various offices within the Memphis and Little Rock Districts and other agencies that will be involved in the comprehensive study.

RESPONSIBILITY ASSIGNMENT MATRIX

The RAM, Appendix C, presents the organizational responsibility for each product and sub product of the feasibility study shown in the WBS. The organization responsible for each product and activity can be cross-referenced with the OBS in Appendix D.

BUDGET AND COST ESTIMATES

Study cost estimates are shown in Appendix E for each fiscal year of the study. The total estimated study cost is $8.6 million based on current costs.

SCHEDULE

An activity network schedule showing the logical progression of all the study activities is presented in Appendix F. This schedule is based on the assumptions presented in the Scopes of Work in Appendix A. The schedule of the major activities and corresponding milestones is listed below:

Milestone Date	Activity
1/1/01	Initiate Feasibility Study
6/1/05	Submit draft Report
10/1/05	Submit final Report/EIS/PMP
10/1/05	Division Engineer's Notice
10/1/05	Complete Basin-Wide Comprehensive Study

CURRENT BENEFITS PLAN

Project benefits for the alternative plans will be developed during the study and will reflect an effective date corresponding to submission of the draft feasibility report.

LOCAL COOPERATION PLAN

The cash requirements of the local sponsors are presented in Appendix E. The cash payments will be made as follows:

a. For each fiscal year of the study, the Government shall, no later than 60 days prior to the beginning of the fiscal year, notify the local sponsors of the sponsors' cash requirement for the upcoming fiscal year.

b. No later than 30 calendar days after the beginning of the fiscal year, the local sponsors shall verify to the satisfaction of the Government that it has deposited the requisite amount in an escrow account acceptable to the Government with interest accruing to the local sponsors.

c. As the study progresses, the Government will adjust the cash amounts required to be provided by the local sponsors to cover contractual and in-house fiscal obligations attributable to the study as they are incurred.

A copy of the escrow agreement between the Government, the local sponsors, and the financial institution is provided as Appendix G.

REAL ESTATE PLAN

The study will involve surveying transects and studies determining the hydrological effects of river elevations. This will require rights of entry to obtain the data. This will be obtained before the work is implemented.

QUALITY CONTROL PLAN

The Quality Control Plan is presented in Appendix H.

STRATEGIC COMMUNICATIONS PLAN

The Strategic Communications Plan is presented in Appendix I.

CULTURAL RESOURCE PLAN

Cultural resources are not considered of direct interest to this study. Cultural resources associated with projects that may develop as a result of this comprehensive study will be identified, evaluated, and protected in compliance with applicable laws and regulations. Cultural resources analyses likely will be required to support the definition of the early to pre-1800s landscape conditions model(s) that may be developed for ecosystem restoration projects. Also, visitation of historic, prehistoric, and cultural sites is a potential component of recreational studies associated with this study plan. Such work also would be fully coordinated under applicable laws and regulations.

ENVIRONMENTAL PLAN

The study will focus on identifying the water resource problems and opportunities. While possible solutions will be identified, all implementation studies and optimization will likely be conducted through subsequent efforts including continuing authorities, existing authority for other projects, or as specifically authorized studies resulting from the comprehensive study. No environmental assessment or environmental impact statement will be conducted as part of the comprehensive study, unless a particular component is carried through plan formulation and a selected plan is recommended.

OPERATION AND MAINTENANCE

Operation and maintenance requirements will be considered during evaluation of alternatives.

MANAGEMENT CONTROL PLAN

Management of this study will be in accordance with ER 5-1-11 and ER 1105-2-100. The project manager and the planning team leader using standard procedures outlined in the regulations referenced above will monitor cost, schedule, and technical performance.

The FCSA formalizes an Executive Committee. The purpose of the Executive Committee is to provide for consistent and effective communication between the local non-Federal sponsor and

the Government. The Committee will be comprised of the District Engineer, his Deputy District Engineer for Project Management, and a person of commensurate decision-making authority for the non-Federal sponsors, and a representative of the Arkansas Soil and Water Conservation Commission, Arkansas Game and Fish Commission, and Missouri Department of Natural Resources. The District Engineer and his local sponsor counterparts will co-chair the committee. The Executive Committee shall appoint representatives to serve on a Study Management Team. The Study Management Team shall keep the Executive Committee informed of the progress of the study and of significant pending issues and actions. The committee will participate in any Issue Resolution Conferences and in decisions and recommendations made by the Study Management Team.

In accordance with Engineer Circular 1105-2-208, the Memphis District will notify HQUSACE of changes that significantly alter the scale and scope of the study so that all parties can reach a new agreement on the conduct of the study.

REPORTING REQUIREMENTS

Reporting of study progress and expenditures will be made using the guidelines given in ER 5-1-11 and ER 1105-2-100.

CHANGE CONTROL PLAN

If a change in activity cost or schedule is identified during the study, the identifying team member will submit a Schedule and Cost Change Report. Re-determination of study scope will be made in consultation with the local sponsor. Submission and approval of Schedule and Cost Change Reports are not a correction for poor planning, poor execution, or efforts/expenditures outside the scope of the PSP. Necessary efforts/expenditures outside the scope of the PSP will be reviewed and approved by the Project Manager and sponsors prior to being undertaken.

SENSITIVITY AND RISK ANALYSES

Risk and uncertainty and certain sensitivity analyses are required under Corps guidelines for evaluation of all water resource problems and projects. The general requirement is to identify all assumptions, predicted variables, estimated values, and parameter values which are critical to the report recommendation and the value of each critical factor where the recommendation would change or feasibility would be questioned. If benefits are dependent on the size and life of a resource, sensitivity analyses may be needed.

UNCERTAINTIES IN SCOPE OF WORK

The PSP defines the tasks required to complete the basin-wide comprehensive study of the White River under Section 729 of WRDA 1986. These tasks and related costs are subject to change during the course of the study if plan modifications, additional plans, or other study modifications are warranted. If changes in the Scope of Work are required, the total cost of the study will be adjusted to reflect such changes.

Appendix A

Scope of Studies

September 28, 2001

APPENDIX A
SCOPE OF WORK AND COST ESTIMATE

1100 - Basin Ecosystem Resources And Uses Relationships (A Conceptual Model)

Why: A conceptual model is necessary to ensure full understanding of the complex interrelationships of the resources and uses in the basin. A conceptual model would be the first step in the study process and the first step in developing an overall computer model. This conceptual model would be used throughout the study as a reference to ensure that interrelationships are fully considered when examining the resources and uses in the basin.

Who: Environmental Team Leader GS 13
Study team
Contractor

When: Beginning of the study

How: At an IPT meeting a conceptual model will be developed by engaging the IPT and

What: Task - Development of concept and present it in a clear concise manner.

Manpower/Cost: 30 days + contractor cost ($2,000)
Artwork - $10,000
Write up and review – 30 days
Sponsor cost - $30,000

Duration: 60 days

Total Cost: 60 Days/$39,000 +$12,000 + $30,000= $81,000

BASIN ENVIRONMENTAL RESOURCES

1200 - Literature/Data Search

What: A literature and data search of historic and current conditions of important resources in the basin will be done. This search will accumulate existing data on aquatic habitats and species (upper basin streams, Wild and Scenic Rivers and National Rivers, Lakes and Reservoirs, tailwater, transition zones, main stem, and lower tributaries) terrestrial habitats and species, endangered, threatened and rare species, migratory birds, wetlands, Wetlands of International

Significance, hypoxia, and hydrology. This search should also include reports and information from government agencies (Federal, state, county, local) on programs which are underway and available to protect, restore and enhance water related resources within the basin.

Why: A great deal of work has been done throughout the White River Basin by many different groups, which will be valuable in helping to describe basin conditions. A search of the existing data and literature will consolidate the information in a format that is useable for the comprehensive study.

When: Work will begin after the project cost-sharing agreement is signed.

How: Contract

Manpower/Cost:
Contract Cost - $40,000
In-house Oversight – 10 MD's; $6,500
Sponsor Cost - $45,000

Duration: 3 months

Total Cost: $46,000 + $45,000 = $91,000

1300 - Environmental Coordination

What: Have regular meetings with contractors and resource agencies to expedite data collection, analysis, and report preparation. Distribute interim reports. Plan field trips to sites that are exemplary or critical.

Why: To keep the project moving and to insure that project sponsors are involved and invested in the final products.

When: Beginning before the cost-sharing agreement is signed.

How: In-house labor

Manpower/Cost: 100 MD's ($65,000); other supplies, printing, travel, etc. ($10,000)

Duration: Throughout the study

Total Cost: $75,000

1400 - Environmental Appendix

What: Prepare a report that summarizes the findings of all of the individual reports on wetlands; wildlife; fisheries; migratory birds; threatened, endangered and rare species, etc. This report will

describe historic, existing, and future with- and without-project conditions of all significant natural resources.

Why: To describe the interrelatedness and conditions of the significant natural resources in the basin.

When: After all of the other reports are completed.

How: In-house labor

Manpower/Cost: 50 MD's; $32,000

Duration: 3 to 6 months

Total Cost: $32,000

1500 - Aquatic Ecosystems Sub-Basin Assessments

What: The White River Basin will be divided into smaller sub-basins (11 digit). Factors, such as water temperature, nutrient levels, contaminants and dissolved oxygen, that are deemed significant will be quantified for each sub-basin and a condition and risk assessment (trend analysis) will be developed. The assessment will cover upper basin streams, the main steam, and the lower tributaries of the White River Basin. Condition assessments will include a discussion of habitat and abiotic parameters and how they are or eventually may affect the aquatic ecosystem. Assessing watersheds at a finer scale will help to identify localized problems and facilitate development of solutions. The assessment will incorporate known data on populations of aquatic species both historic and current.

Why: These assessments will be conducted to evaluate watershed condition and health and identify potential opportunities for aquatic ecosystem restoration.

When: Beginning after cost-sharing agreement is signed.

How: In-house labor, contractor, and resource agency personnel. An Interagency Working Group will focus the study on the factors and landscape parameters that are most important.

Manpower/Cost:
Sponsor Cost - $135,000
In-house Oversight – 40 MD's; $26,000

Duration: 2 years

Total Cost: $135,000+26,000= $161,000

1600 - Watershed Restoration Plans

What: The aquatic sub-basin assessments will be used to rank sub-basins relative to the degree of environmental degradation exhibited. An inter-agency team will establish the criteria use for rankings. Watershed management plans will be developed to improve aquatic ecosystem conditions within six of the most critically impaired 8-digit watersheds. Aquatic habitat models will be employed to estimate fishery benefits associated with restoration plans.

Why: Aquatic ecosystems within the White River Basin have been severely degraded. These restoration plans will be formulated to reduce impacts, such as pollution, to aquatic ecosystems within 6 selected sub-basins. Information derived from the study of these selected watersheds will be used to estimate improvements possible within the entire basin and the costs for those improvements.

When: Beginning after watershed assessments are complete.

How: In-house labor, contractor, and resource agency personnel. The NRCS will be critical in determining the farm features and estimating their benefits and costs. An inter-agency team will focus the study on the factors and landscape parameters that are most important.

Manpower/Cost:
NRCS - $120,000
Sponsor - $200,000
In-house Cost - 90 MD's; $175,000

Duration: Two years

Total Cost: $120,000+$200,000+175,000 = $495,000

1700 - Aquatic Ecosystem- Wild & Scenic Rivers And National Rivers

What: Obtain copies of eligibility/suitability studies for wild and scenic rivers in the basin and appropriate management plan for them and the Buffalo National River.

Why: To identify the special features of these rivers and the outstandingly remarkable values for which they were designated. This will allow the comprehensive study to address how conditions within the basin may influence these rivers now or in the future.

When: After the cost-sharing agreement is signed.

How: In House labor

Manpower/Cost: 10 MD's; $6,500

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Duration: 3 months

Total Cost: $6,500

1800 - Fish and Wildlife Coordination

Why: In order to comply with the Fish and Wildlife Coordination Act

When: Throughout the study.

Manpower/Cost: $18,000 per year for four years - $72,000

1900 - Hydrologic Effects On Lower Basin Wetlands (King Study)

What: Studies will be conducted to (1) characterize bottomland plant communities and delineate their distribution in the Lower White River Basin; (2) quantify the relationship between tree vigor and growth and historic, existing and potential hydrology; (3) characterize and delineate oxbows, sloughs, and other wetland habitats within the Lower White River Basin; and (4) quantify the effects of hydrologic changes on plant succession in oxbows, sloughs, and other wetland habitats. This data will be used to help identify wetland restoration needs in the lower basin.

Why: The wetland resources of the Lower White River Basin consist of bottomland hardwood forests, oxbow lakes, sloughs, and other wetland habitats that are of international significance. Understanding the potential impacts of hydrologic alterations on wetland resources requires knowledge of the current distribution and condition of wetland resources and their linkages to geomorphic and hydrologic processes.

When: Initiate fall 2001; need satellite imagery, hydraulic data, wetland maps, survey transects, etc.

How: Contract

Manpower/Cost:
Contract Cost – $549,550 (year 1 = $181,250; year 2 = $152,250; year 3 = 152,250; year 4 = 63,800)
In-house Oversight – $12,000

Duration: 4 years

Total Cost: $549,550 + $12,000 = $561,550

Data required for the King Study

1900.1 - Satellite Imagery - Gather MSS or TM imagery on White River main stem, Cache River, and Bayou DeView for four dates at each 1-ft. elevation (+/- .25 ft.) from 2 ft. below flood stage to the 5-yr. flood stage. This will be used to map areas flooded and depth of flood at a given gage reading at 1-ft. increments.

Manpower/Cost: $0

1900.2 - Elevation Surveys - 15 transects along the White River, 3 along Bayou de View and 3 along the Cache River

Manpower/Cost: $200,000

1900.3 - Extensive Hydraulic Modeling - Hydraulic-modeling efforts will be required for the study. The existing period of record daily gage/discharge data on the White River from Newport downstream will be presented under existing conditions, natural ecosystem conditions, and expected future conditions. The existing conditions will assume the Grand Prairie project is in place along with the modified releases for low flows. The natural ecosystem conditions will assume that the reservoirs are not in-place, the land use changes had not taken place, and the levees had not been constructed. The proposed model will be an unsteady flow model. An unsteady flow model is necessary to evaluate changes in duration of overbank flooding at ungaged locations.

Manpower/Cost: $170,000

1900.4 - Stage/discharge on Cache River and Bayou DeView. Existing studies performed in cooperation with the ASWCC will be utilized to the fullest extent possible.

Manpower/Cost: $15,000

1900.5 - 10-day average MSL stage on the Mississippi at the mouth of the White. This is needed to examine backwater flooding.

Manpower/Cost: $8,000

1900.6- Gather MSS or TM imagery on White River main stem, Cache River, and Bayou DeView for four dates at each 1-ft. elevation (+/- .25 ft.) from 2 ft. below flood stage to the 5-yr. flood stage. This will be used to map areas flooded and depth of flood at a given gage reading at 1-ft. increments.

Manpower/Cost: $15,000

Total Cost (King Study) = $561,550+$39,000+$200,000+$208,000 = $1,008,550

2000 - Terrestrial Habitat Evaluation

What: The terrestrial ecosystem is comprised of upland areas outside of the direct hydrologic influence of rivers, lakes, and upper basin streams. Terrestrial habitats include upland hardwoods and prairies. Terrestrial habitat conditions will be determined for historic, existing, and future without-project conditions in order to identify potential opportunities for terrestrial habitat restoration.

GIS will be employed to (1) help determine the amount of upland habitat that has been lost in the basin, (2) identify areas that are in greatest need of restoration, and (3) select areas where restoration would have a high probability of success.

Why: Although uplands within the White River basin have been impacted to a lesser degree than wetlands, upland habitats have still been heavily impacted by clearing and land-use practices.

When: Initiate fall 2001; need historic and existing land-use data

How: In-house

Manpower/Cost: 60 MD's; $10,000
Sponsor Cost - $30,000

Duration: 80 days

Total Cost: $10,000 + $30,000 = $40,000

2100 - Wetlands Evaluation

What: Wetlands are defined as areas outside of stream channels that are hydrologically influenced by streams and/or groundwater. Wetlands include bottomland hardwood forests, forested and scrub/shrub swamps, and marsh. Historic, existing, and future without-project conditions of wetlands will be determined in order to identify potential wetland restoration opportunities in the basin.

GIS, agency records, and literature will be used to (1) determine wetlands losses that have occurred in the basin to date, (2) identify areas that are in the greatest need of restoration, and (3) select areas where restoration would have a high likelihood of success.

Why: The majority of historic wetland areas within the White River Basin have either been destroyed or heavily degraded.

When: Initiate fall 2001; need historic and current land-use data and wetlands map.

How: In-house

Manpower/Cost: 60 MD's; $10,000
Sponsor Cost - $30,000

Duration: 80 days

Total Cost: $10,000 + $30,000 = $40,000

2200 - Migratory Birds

What: Migratory Bird Habitat Assessment – Historic, present, and future without-project habitat conditions will be established in order to determine the habitat needs of migratory birds within the White River Basin. Opportunities to restore migratory bird habitat will be identified.

Why: The White River Basin provides important habitat for migratory birds. In fact, the White River bottoms and Grand Prairie region comprise the most important wintering area in North America for mallards. The White River Basin also contains important habitat for neo-tropical songbirds, shorebirds, and wading birds. Unfortunately, much of the historic habitat for migratory birds in the basin has been lost.

When: Initiate fall 2001; need historic and current land-use and flooding data

How: In-house labor.

Manpower/Cost: 60 MD's; $10,000
Sponsor Cost - $30,000

Duration: 100 MD's

Total Cost: $10,000 + $30,000 = $40,000

2300 - Endangered/Threatened Species

What: The current status of federally listed endangered/threatened species, and critical habitats, will be determined as well as the status of state-listed species of special concern. Potential measures to protect, enhance, or restore habitat for these species will be identified.

Current status and population locations of these species will be ascertained through literature searches and information obtained from records kept by the U.S. Fish and Wildlife Service,

Corps, and state natural heritage agencies. This information will be incorporated into a GIS database. GIS will be employed to help determine environmental influences (e.g., habitat fragmentation, pollution) on endangered/threatened species and species of special concern and to facilitate development of potential measures to improve habitat conditions for these species.

Why: Endangered and threatened species are species that have experienced severe population declines and are protected by the Endangered Species Act. Species of special concern are listed by states as species that are rare and/or experiencing population decline, but they are not federally listed endangered or threatened species. All of these species are in need of management and would benefit from habitat restoration or enhancement.

How: In-house

When: Initiate following completion of literature/data search

How: Manpower/Cost: 40 MD's; $10,000
Sponsor Cost - $30,000

Total Cost: $10,000 + $30,000 = $40,000

2350 Evaluation of Permanent Wetlands in the Lower White River

What: The lower White River, which extends from the mouth up to Newport, AR, is characterized by numerous permanent wetland habitats that are structurally and hydrologically diverse. Permanent wetlands can be classified into two groups: large waterbodies such as oxbow lakes, and small waterbodies such as scatters, brakes, and floodplain ponds usually less than 1/2 acre in size. Oxbow lakes are important to larval fishes as rearing habitat and many lakes are recreationally fished. Smaller waterbodies support distinct assemblages of wetland fishes, and these habitats are of particular importance to amphibians. Both of these latter groups include species that are declining in abundance throughout their range and some are listed as imperiled.

Recent Corps projects in the White River have resulted in a substantial database on main channel fishes in the lower reaches, but only a few studies have addressed floodplain habitats. Six oxbow lakes that represented a range of hydrologic connectivity were sampled once during summer 1998. In addition, detailed surveys of the controlling elevation of backwater inlets were conducted in 2001. Other than a 2-year larval fish study in the Cache River during the late 1980's, we are not aware of any other wetland studies of amphibians or fish in the White River system.

The primary objective is to develop correlative models describing the relationship between hydrogeomorphic features of permanent wetlands and their vertebrate assemblages.

Why: These data can be used in basin-wide assessments of wetlands habitats, to assess cumulative impacts of flood control or navigation on poorly studied habitats that often support imperiled species, and to develop management strategies for permanent wetlands that includes optimum design of restored or created wetlands.

When: Study will be initiated in 2002 and should finish in 2003.

How: Contract

Manpower/Costs:

Contract Costs - $80,000 in FY02 and $125,000 in FY03

Duration: 2 years

Total Cost: $915,000

Total Cost: $205,000

2400 - Evaluation Of Ecosystem Restoration Options Within Lower White River Basin (Heitmeyer Study)

What: A comprehensive analysis of ecosystem restoration options will be prepared for the Mississippi Alluvial Valley (MAV) portion of the Lower White River Basin in southern Missouri and eastern Arkansas. The study area will include parts of Butler and Ripley Counties in Missouri and Randolf, Clay, Lawrence, Jackson, Poinsett, Cross, Woodruff, Prairie, Lonoke, Arkansas, and Monroe Counties in Arkansas. It is bounded by the Ozark uplift on the west, the Arkansas River drainage on the south, the L'Anguille and St. Francis River drainages on the east, and the Ozark uplift and Cache River and Black River headwaters on the north. This study would systematically evaluate 6 primary drainage regions in the lower basin to identify ecological attributes and locations that offer the greatest opportunities for ecosystem restoration. Collectively, these opportunities will be used to prepare a strategic plan, and recommend priorities, for restoration of representative habitats in the entire Lower White River Basin.

The six major drainages (sub-basins) that will be examined under this study are the (1) Black River, (2) Cache River, (3) Bayou Deview, (4) Upper White River (Newport – Clarendon), (5) Lower White River (Clarendon – mouth), and (6) Grand Prairie. Historic geology, geomorphology, archeology, and natural history information will be synthesized for each sub-basin area and collectively for the entire MAV region of the White River Basin. The study will identify how the structure and function of each sub-basin and the entire region have been altered. The study will also identify restoration approaches and ecological attributes associated with successful restoration of specific habitats and ecological conditions in each sub-basin area and collectively for the entire MAV portion of the basin.

Why: Human-induced changes since the early 1800s in the MAV portion of the Lower White River Basin have resulted in tremendous loss and degradation of natural habitats such as bottomland hardwood forests and other wetlands.

When: Study will be initiated in January 2002; need historic and current aerial photography, land-use data, wetland maps, hydraulic data, etc.

How: Contract

Manpower/Costs:
Contract Costs - $875,000 (year 1 = $250,000; year 2 = $225,000; year 3 = $200,000; year 4 = $200,000)

In-house Oversight - 60 MD's; $40,000

Duration: 4 years

Total Cost: $915,000

2500 - Navigation/Transportation Needs

Why: All modes of transportation interplay heavily in the basin and have the potential not only for competition but also for support for one another and inter-modal operations.

Who: ATHD and MODOT and others as determined appropriate during the course of the research.

When: As early as possible during the course of the study.

How: Project Economist.

What: - Literature Search - The transportation needs of the basin will be examined to determine problems and opportunities. The majority of the effort will include incorporation of existing studies and data by others and the navigation studies to characterize the compete range of transportation needs in the basin including road, railroad, airport, and water borne traffic.

Manpower/Cost: 60 days + 60 with sponsor/$215,000
35 days 1 person/$20,000

Duration: 130 days

Total Cost: $235,000

2600 - People and Economy

Why: Demographic changes as well as economic projections are highly relevant to problem definition and opportunities afforded.

Who: Economist

When: Upon study initiation

How: Literature research and contact with other agencies and governing bodies.

Manpower/Cost: 40 days 1 person/$55,000

Duration: 2 months

Total Cost: $55,000

2700 - Recreation

Why: Essential component of a comprehensive study

Who: Economist

When: Initiated during determination of existing conditions.

How: Literature Review of existing reports and data, consultation with locals, questionnaires and field surveys.

Manpower/Cost: Sponsor/$210,000
70 days 1 person/$40,000

Duration: 130 days

Total Cost: $250,000

Water Uses

2800 - Groundwater-Agricultural Water Supply

Why: A complete understanding of the ground water situation is necessary to fully determine the water resources related problems and needs within the basin. The principle user of ground water is agriculture though other users include municipal and industrial users. Both the ground water quality and the quantity are important. Threats to ground water quality in the upper basin will be identified. The quality of the ground water will be compared to existing standards. Trends in groundwater use and recharge will be identified management options explored.

Who: The Corps in conjunction with the ASWCC

When: After completion of the basin conceptual model

How: Existing studies and reports along with data scheduled to be completed will be reviewed.

Manpower/Cost: Corps - 30 days/$19,500
Sponsor - 250 days/$162,500

Total cost: $182,000

2900 - Water Supply/Wastewater Treatment

Why: Water supply and wastewater treatment issues effect the water quantity and quality in the basin. Population growth has made issues rise to the forefront.

Who: The Corps

When: Throughout the study.

How: The prior studies and reports on water supply and wastewater treatment will be examined. Future trends in population will be used to estimate future growth in water use and wastewater treatment needs. The adequacy and growth potential of existing infrastructure will be considered in light of the rapid increase in demand.

Manpower/Cost - 120 days/$80,000

Total Cost: $80,000

3000 - GIS

What: Data Queries / Assistance from GIS - 11 Major Areas of Study

Why: To perform queries within the GIS to assist and perform required analysis for Project completion

Who: GIS data administrator, GIS Coordinator, GIS Technician

When: After data has been collected and validated

How: Using GIS software capabilities

Manpower/Cost: 110 days/$100,000

Duration: Throughout the study.

Total Cost: $100,000

3000.1 - GIS - Pilot Project

What: Generate data and sample queries for one county within the project area

Why: Develop successful workflows and identify future data problems in project completion

Who: GIS Data Administrator, GIS Coordinator, GIS Technician

When: Initial Phase of Study

How: Identify county, acquire required data and run necessary queries within area

Manpower/Cost: 40 days/$26,000

Duration: Initial study phase

Total Cost: $26,000

3000.2 - GIS - Data Management

What: Perform data integration of downloaded data to USACE Standards. Acquire one Computer data server / storage server including upgrades and maintenance for 4 years of project.

Why: Provide downloaded data in a usable and familiar format for data analysis and reports

Who: GIS Data Administrator, GIS Coordinator, and a GIS Technician

When: After data acquisition

How: Use existing USACE naming convention and data catalog for template to rename and move acquired data

Manpower/Cost: 25-days/$17,000 computer cost $50,000

Duration: Entire Study

Total Cost Data Management = $17,000 + $50,000 = $67,000

3100 - Hydropower/Power Generation Needs

What: A compilations of the existing data a studies involving hydropower and power generation needs in the basin will be made.

Why: To document the existing conditions and expected future trends. These trends may have significant impacts on future maintenance or expansion of facilities.

Who: Southwest Power Association (SPA) and Corps of Engineers.

When: Following execution of the cost share agreement.

How: Using existing data sources

Duration: One Year

Total Cost: $50,000

3200 - Flood Control Assessment

What: The existing data on basin flooding will be evaluated and literature sources including newspapers will be used to document the flooding potential in the basin.

Why: To understand the existing flood problems and future trends regarding flooding.

Who: Corps of Engineers

When: Following execution of the cost sharing agreement

How: Using existing data sources.

Duration: Throughout the study.

Sponsor Cost - $60,000

Total Cost:- $400,000

3300 - Aquatic Ecosystem -Lakes/Reservoirs

3300.1 - Quantify water quality in the Beaver Lake.

Contract Cost (USGS): $376,500 ($100,000 Federal to run the program coming from this study. $276,500 for data collection paid for by the State of Arkansas.)

3300.2 - Quantify water quality in the Table Rock Lake.

Contract Cost: $1,048,000 to collect data and $100,000 to run the model.

3300.3 - Quantify water quality in Lake Taneycomo

Estimated Contract Cost: $330,000

3300.4 - Development of Hydrodynamic models of Beaver and Table Rock Lakes

Estimated Contract Cost: $147,600

3300.5 - Aquatic Ecosystem Fishery Studies

What: Aquatic benefits associated with watershed restoration plans will be quantified.

Task 1: Habitat models for upper basin streams will be developed, and aquatic benefits will be quantified using the Habitat Evaluation Procedure (HEP). Field studies will be conducted during low water season (summer/fall) to develop relationships between fish diversity (e.g., Index of Biotic Integrity) and water quality (nutrients, dissolved oxygen, turbidity). These relationships will be standardized to a Habitat Suitability Index (HSI) Value (0-1) and Habitat Units will be calculated for baseline conditions and predicted improvements in water quality.

Task 2: **Habitat Improvement Bullshoals and Table Rock Lake -** Benefits of nutrient reduction to Beaver and Table Rock reservoirs will be evaluated. Habitat models developed in the 1960's and 1970's by the U.S. Fish and Wildlife Service, National Reservoir Research Program, will be used to quantify benefits of decreased eutrophication to fish standing crop. The database used to prepare these models included the White River chain of reservoirs, and the HSI model will be developed from these data.

Task 3: Benefits to the lower White River will be quantified using HEP. Fishery data collected for the Cache River wetland assessment in the late 1980's, Grand Prairie Area Demonstration Project, and White River Navigation Study will be used to develop models. No further field collections are required, except for the reach between Batesville and Newport. Seasonal sampling in this reach is necessary to be compatible with the existing database for the White River.

Why: To develop a model and a system of measurements for aquatic habitat restoration.

When: Initiate fall 2001.

How: Contract

Manpower/Cost:
Contract Cost - $165,000 (Task 1 = $75,000; Task 2 = $25,000; Task 3 = $65,000)
In-house Oversight – 25 MD's; $17,000

Duration: 3 years (Task 1 = 1 year; Task 2 = 3 months; Task 3 = 1 ½ years)

Total Cost: $165,000+$17,000 = $182,000

PLANNING, AND PROJECT MANAGEMENT

100.1 Public Involvement.

Implement a public involvement program.

Why: To ensure the public is kept informed of study progress and findings and that public input is incorporated into the plan formulation process.

Who: GS-12 Project Manager, local sponsor, and A-E contractor.

When: Throughout the study, as required.

How: By coordination with sponsor, preparing news releases, information fact sheets, conducting shop meetings, etc. Public involvement will be implemented through public meetings, and other public involvement coordination activities. Public meetings will be conducted as required to provide and receive information to and from the public.

Manpower/Cost: 30 days/$65,600 Sponsor 30 days/$40,000

Duration: Throughout the study.

Total Cost: $40,000 + $65,600 = $105,600

100.2 Study Management.

Conduct study in accordance with Project Study Plan (PSP). Lead and direct IPT. Coordinate with non-Federal sponsor.

Why: To implement study in accordance with PSP.

Who: GS-12 Project Manager

When: Throughout study as required.

How: Conduct the study in accordance with the PSP to optimize the design features of the reconnaissance study alternatives through the management of the IPT. Give consideration to additional alternatives that might reduce environmental impacts and/or increase net benefits. Coordinate and synthesize the efforts of the IPT members, District technical specialists, support personnel, consultants, contractors, and state, Federal, and local agencies participating in the study. Determine the work to be accomplished, work assignments, schedules, and guidance; and assist in resolving unusual or controversial problems. Monitor the progress of the study and report to higher echelons. Meet and deal with representatives of various governmental agencies and private organizations to discuss study-related matters and problems. Negotiate differences on criteria and procedures for the processing of data and findings to be utilized to meet the established mutual goals and objectives of the study. Review the completed study material to assure that conclusions and decisions reached are consistent with sound engineering and planning practices and conform to Corps and other governmental policies and requirements. Research, review, and analyze available engineering material to assist in the development of information pertaining to the study area, which may be required by IPT members or higher echelon. Direct team members in the preparation of required report input.

Monitor all study expenditures using CEFMS reports to determine funds are properly expended. Measure study expenditures against study schedule and funds availability. Report monthly expenditure gains and slippage to Planning, Programs, and Project Management Division for monthly reporting including rationale for gains and slippage.

The local sponsor will appoint a point of contact who will coordinate sponsor activities with the Corps. The sponsor's point of contact will coordinate efforts to meet the obligations and schedules described herein when the sponsor has a lead role in an activity. When the role of the sponsor is to support an activity, the Corps manager will coordinate efforts to accomplish the assigned tasks in a timely manner.

Manpower/Cost: 350 days/$227,075; Sponsor 300 days/$167,925

Duration: Throughout the study.

Total Cost: $227,075 + $167,925 = $405,400

100.3 Budget Preparation & Support.

Develop information to prepare yearly study budgets. Update PSP's as needed. Coordinate with Programs Management Branch to ensure adequate Federal funds are available. Coordinate with sponsor to ensure adequate non-Federal funds are available. Provide input for follow-up questions by CEMVD, HQUSACE, and congressional interests.

Prepare budget requests throughout the feasibility study based on the Project Manager's funding needs. Develop the budget request for PED funding.

Why: To assure adequate funds are available to accomplish feasibility study.

Who: GS-12 Project Manager.

When: Throughout the study as required.

How: Routinely monitor study requirements and funds availability. Prepare PB-3's, Form 17's, issue statements, factsheets and review budget documents

Manpower/Cost: 200 days/$125,600 Sponsor 50 days/$40,000

Duration: Throughout the study.

Total Cost: $125,600 + $40,000 = $165,600

100.4 Plan Formulation and Evaluation.

Plan formulation will begin with review and verification of the area by specific location and needs. Review of existing and without-project hydrologic, economic, and environmental data necessary to develop alternatives; review of previous studies to aid in developing potential solutions; and arranging and preparing briefings and presiding over meetings to formulate alternative plans will be accomplished. All data necessary for plan development and evaluation will be collected. An array of alternative plans of improvement will be developed and evaluated in order to identify the plan that best meets the needs of the area. Beneficial and adverse impacts will be evaluated and the alternatives refined or reformulated as necessary to maximize beneficial impacts and minimize adverse impacts.

Why: To identify potential actions to address the problems and needs of the White River Basin and estimate impacts, costs, and benefits of these potential solutions

Who: GS-12 Project Manager

When: Beginning with initiation of study and continuing up to selection of recommended plan..

How: Coordinate closely with non-Federal sponsor; Federal, state and local agencies; and other associated stakeholders. Utilize Corps planning regulations and guide study team as required.

Manpower/Cost: 330 days/$242,600 Sponsor 110 days/$55,000

Duration: Throughout the study until selection of recommended plan.

Total Cost: $242,600 + $55,000 = $297,600

100.5 - Prepare Draft of modern historic conditions, existing conditions, and future without project conditions portions of the Report.

Why: To provide a summary of studies and basis for establishing goals and objectives and plan formulation.

Who: GS-12 Study Manager

When: Prior to plan formulation

How: By compiling studies being conducted and literature searches.

Manpower/Cost: 40 days/$40,200

Duration: 40 days

Total Cost: $40,200

100.6 - Preliminary Draft of Main Report.

Prepare draft of Main Report including text and plates.

Why: To provide a summary of documentation of the study.

Who: GS-12 Study Manager

When: Prior to assembling and printing Draft Report

How: By researching, historical data and document appropriate study results using in-house labor and personal computers with appropriate word processing and graphic software.

Manpower/Cost: 140 days/$80,000

Duration: 140 days

Total Cost: $80,000

100.7 - Assemble/Print Preliminary Draft Report.

Assemble Main Report, and appendixes for printing. Preparing pagination sheets for printer. Coordination with printer prior to and during printing. Print 20 copies of report.

Why: To ensure Draft Report is printed on schedule for District and Division review.

Who: GS-12 Study Manager

When: Beginning with preparation of Main Report and prior to District office review.

How: Using in-house labor and coordinating with printing contractor.

Manpower/Cost: 3 days + supplies/$5,000; $3,000 contract.

Duration: 20 days

Total Cost: $8,000

100.8 - Technical Review.

Serve as Review Team Leader and lead the Independent Technical Review Team in a thorough and seamless review of technical aspects of the report. Conduct technical review of Main Report and other appropriate appendixes. Prepares documentation for technical review package.

Why: To ensure a quality report is prepared.

Who: Team (See QPC)

When: Throughout the study.

How: Conducting team meetings using oral, written, and electronic communications.

Manpower/Cost: 3 reviews with 15 people for 2 days each/$60,000

Duration: Throughout the study.

Total Cost: $60,000

100.9 - Sponsor Review.

Why: To ensure that the data and text of the various report elements are correct and consistent. District review will be the first opportunity to see the body of study data in a consolidated form.

Who: GS-12 Project Manager and local sponsor.

When: After assembling and printing the Draft Report/EIS/PMP.

How: Copies of the assembled documents will be reviewed by each IPT member and comments developed.

Manpower/Cost: ASWCC -
AGFC -
ANH - | 60,000 in-kind services
MDNR -
MDC -

Duration: 20 days

Total Cost: $60,000

100.10 - Revise/Print Preliminary Draft Report - CEMVD/OCE Review.

Why: To incorporate IPT comments from District review and prepare documents for Headquarters review.

Who: GS-12 Project Manager, GS-09 Civil Engineering Technician, and A-E contractor.

When: After District review.

How: Draft documents will be revised to reflect IPT comments and reprinted. Comments will be reviewed by the project manager for consistency and consolidation. Documents will be provided to Headquarters for review in accordance with guidance in ER 1105-2-100.

Manpower/Cost: 5 days/$5,000

Duration: 20 days

Total Cost: $5,000

100.11 - Review Support.

Who: Non-Federal sponsor.

Why: To ensure that the non-Federal sponsor is afforded the opportunity to participate in any significant effort as a result of Headquarters level review. Cost should be limited to 5 percent of the total study cost or $50,000, whichever is less, and is cost shared 50/50.

When: During Headquarters review.

How: By attending meetings and conferences with Headquarters.

Manpower/Cost: $50,000 In-Kind

Duration: 40 days

Total Cost: $50,000

100.12 - Prepare draft Study Plan

Why: To ensure that the non-Federal sponsor is afforded the opportunity to participate in any significant effort as a result of Headquarters level review. Cost should be limited to 5 percent of the total study cost or $50,000, whichever is less, and is cost shared 50/50.

Who: Non-Federal sponsor.

When: At the beginning of the study.

How: By attending meetings and conferences with the Interagency Planning Team.

Manpower/Cost: $100,000

Duration: Six months

Total Cost = $100,000

100.13 - Revise/Print Draft Report/PSP.

Incorporation of revisions to report following Headquarters review. Updating report text and plates. Preparing pagination sheets for printer. Coordinating with printer prior to and during printing. Print 200 copies of report.

Why: To ensure draft document is prepared and printed on schedule.

Who: GS-12 Project Manager, GS-09 Civil Engineering Technician, and printing contractor.

When: Following Headquarters review of Draft Report and prior to public review.

How: Using in-house labor and coordinating with printing contractor.

Manpower/Cost: 90 days $20,000

Duration: 90 days

Total Cost: $20,000

100.14 - Prepare and Print Final Report - Incorporation of revisions.

Preparing Final Report, plates, and text. Preparing pagination sheets for printer. Coordinating with printer prior to and during printing. Print 100 copies of report.

Why: To ensure final document is prepared and printed on schedule.

Who: GS-12 Project Manager, GS-09 Civil Engineering Technician, and printing contractor.

When: Following public comment period on Draft Report and prior to submission of Final Report.

How: Using in-house labor coordinating with printing contractor.

Manpower/Cost: 11 days/$7,000; $5,000 contract.

Duration: 30 days

Total Cost: $12,000

100.15 - Budget Preparation &Support.

Prepare study budget documents, justification sheets, briefing papers, budget factsheets, budget issue papers, etc. Monitor funds and funding to separate offices throughout CEMVM.

Why: To support PR with periodic updates of budget documents and study status report.

Who: GS-11 Program Analyst.

When: Throughout the study.

How: Prepare justification sheets, fact sheets, briefing papers, issue papers, etc., required for initial, OMB, and congressional budget submissions. Assist the project manager with the annual budget preparation and follow up questions by CEMVD, HQUSACE, and congressional interests. Monitoring obligations and expenditures for the 2101 report.

Manpower/Cost: 240 days/$160,000

Duration: Throughout the study.

Total Cost: $160,000

100.16 - Supervision and Review.

Supervise all input to the project.

Why: To assure that Branch goals and objectives are met.

Who: GS-13 Supervisory Civil Engineer.

When: During all phases of the study requiring input from Branches.

How: Review of input for the report including the in-house technical review. This will be accomplished through meetings and oral, written, and electronic communications.

Manpower/Cost: 80 days/$65,000

Duration: Throughout the study.

Total Cost: $65,000

100.17 - Revise Draft Appendix - CEMVD/HQUSACE Review.

Why: To incorporate Interdisciplinary Planning Team comments from District review and prepare document for HQUSACE review.

Who: GS-12 Civil Engineer.

When: After District review.

How: Draft documents will be revised to reflect IPT comments. Comments will be reviewed for consistency and consolidation.

Manpower/Cost: 3 day/$12,000

Duration: 10 days

Total Cost: $12,000

100.18 - Revise Draft Appendix - Public Review.

Incorporate revisions to report following Division review. Update report text and plates.

Why: To ensure information in the draft document is correct and consistent prior to distribution for Federal, state and local agency and public review.

Who: GS-12 Civil Engineer.

When: Following HQUSACE review and prior to public review.

How: Using in-house labor.

Manpower/Cost: 2 days/$2,000

Duration: 10 days

Total Cost: $2,000

100.19 - Final Appendix.

Incorporate revisions to report following public review. Prepare final appendix, plates and text.

Why: To ensure final document is prepared and printed on schedule.

Who: GS-12 Civil Engineer.

When: Following public comment period on Draft Report and prior to submission of Final Report.

How: Using in-house labor.

Manpower/Cost: 2 days/$2,000

Duration: 10 days

Total Cost: $2,000

Appendix B

Work Breakdown Structure

Appendix C

Responsibility Assignment Matrix

Responsibility Assignment Matrix
White River Comprehensive Study
P = Prepares R = Reviews S = Supports

	Basin Ecosystem Resources and users Relationships (A Conceptual Model)	Literature Data Search	Environmental Coordination	Aquatic Ecosystems Sub-Basin Assessments	Watershed Restoration Plans	Aquatic Ecosystems-Wild and Scenic and National Rivers	Fish and Wildlife Coordination	Hydrologic Effects on the Lower Basin Wetlands (King Study)	Satellite Imagery	Elevations Survey Transects	Hydraulic modeling efforts	Stage/discharge on Cache River and Bayou DeView	10-day average MSL stage on the Mississippi at the mouth of the White	Gather MSS or TM imagery on White River main stem, Cache River, and Bayou DeView	Terrestrial Habitat Evaluation	Wetlands Evaluation	Migratory Birds	Endangered/Threatened Species	Evaluation of Permanent Wetlands in the Lower White River (Heitmeyer Study)	Navigation/Transportation Needs
Planning, Programs, and Project Management Division/Planning & Regulatory Division																				
Project Management Branch/Planning Branch	P	P		S	P	S		P											P	
Programs Management Branch				P																
Environmental and Economic Analysis Branch	S	S	P	S	S	S	S	S							S	S	S	S	S	S
Real Estate Division																				
Real Estate Appraisal Branch																				
Engineering Division																				
Civil Design Branch																				
Hydraulics & Hydrology Branch											P	P	P	P						
Geotechnical Design																				
Geospatial Engineering Branch									P	P										
General Engineering Branch																				
Cost Engineering and Design																				
Reports Branch																				
Contracting Division																				
Office of Counsel																				
Public Affairs Office																				
Local Sponsors																				
AR Game and Fish Commission	P	P													P	P	P	P		
AR Soil and Water Conservation Commission	P	P		P	P															
MO Department of Natural Resources	P	P																		
MO Dept of Trans/AR Highway Trans Dept																				P
AR Dept of Tourism and Parks																				
Other Federal Agencies																				
U.S. Geological Survey																				
U.S. Department of Agriculture, Natural Resources Conservation Service					P															
Waterways Experiment Station																				

Responsibility Assignment Matrix
White River Comprehensive Study
P = Prepares R = Reviews S = Supports

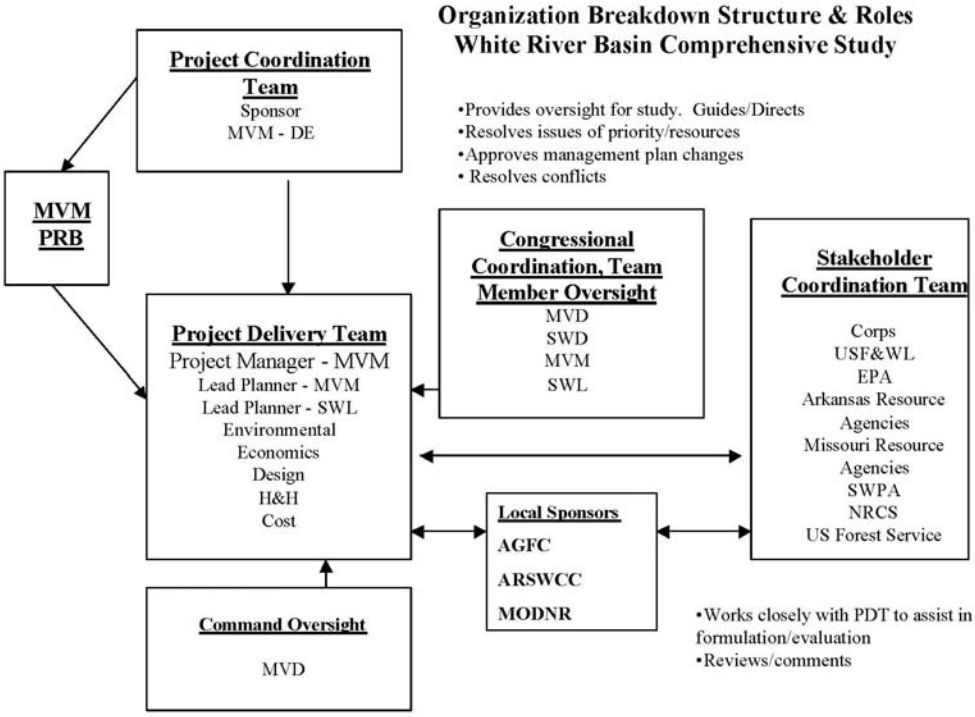
	People and Economy	Recreation	Groundwater-Agricultural Water Supply	Water Supply/Wastewater Treatment	Data Queries / Assistance from GIS - 11 Major Areas of Study	Generate data and sample queries for one county within the project area	Perform data integration of downloaded data to USACE Standards	A compilations of the existing data a studies involving hydropower and power generation needs in the basin will be made.	The existing data on basin flooding will be evaluated and literature sources including newspapers will be used to document the flooding potential in the basin.	Quantify water quality in the Beaver Lake.	Quantify water quality in the Table Rock Lake.	Quantify Water quality in Lake Taneycomo	Development of Hydrodynamic models of Beaver and Table Rock Lakes	Aquatic Ecosystem Fishery Studies (Kilgore Study)	Habitat Improvement Bullshoals and Table Rock Lakes	Public Involvement	Study Management	Budget Preparation & Support	Plan Formulation and Evaluation	Prepare Draft of modern historic conditions, exisitng conditions, and future without project conditions portions of the Report.
Planning, Programs, and Project Management Division/Planning & Regulatory Division																			R	
Project Management Branch/Planning Branch			S	P				P	P							P	P		P	S
Programs Management Branch																		P		
Environmental and Economic Analysis Branch	P	S												S					S	P
Real Estate Division																			S	
Real Estate Appraisal Branch																				
Engineering Division																			S	
Civil Design Branch																				
Hydraulics & Hydrology Branch																				
Geotechnical Design																				
Geospatial Engineering Branch					P	P	P													
General Engineering Branch																				
Cost Engineering and Design																				
Reports Branch																				
Contracting Division																				
Office of Counsel																				
Public Affairs Office																				
Local Sponsors																				
AR Game and Fish Commission																			S	
AR Soil and Water Conservation Commission			P																S	
MO Department of Natural Resources																			S	
MO Dept of Trans/AR Highway Trans Dept																				
AR Dept of Tourism and Parks		P																		
Other Federal Agencies																				
U.S. Geological Survey										P	P	P	P		P					
U.S. Department of Agriculture, Natural Resources Conservation Service																				
Waterways Experiment Station														P						

Responsibility Assignment Matrix
White River Comprehensive Study
P = Prepares R = Reviews S = Supports

	Preliminary Draft of Main Report	Assemble/Print Preliminary Draft Report	Technical Review	Sponsor Review.	Revise/Print Preliminary Draft Report - CEMVD/OCE Review.	Prepare draft Study Plan	Prepare and Print Final Report	Supervision and Review - Supervise all budget request	Revise Draft Appendix - CEMVD/HQUSACE Review.	Revise Draft Appendix - Public Review	Final Appendix	Problems Needs and Opportunities	Tech Review	Development of Goals and Objectives	Analysis of Potential Alternatives	Review with Conceptual Model	Notice of Report	Prepare Chief's Report
Planning, Programs, and Project Management Division/Planning & Regulatory Division			R			R		R					R					
Project Management Branch/Planning Branch	P	P			P	P	P	P	P	P	P	P	P	P	P	P	P	P
Programs Management Branch								S										
Environmental and Economic Analysis Branch		S	R			S							S	S	S	S		
Real Estate Division			R										R					
Real Estate Appraisal Branch						R												
Engineering Division			R			R							R					
Civil Design Branch						S							S	S	S	S		
Hydraulics & Hydrology Branch						S							S	S	S	S		
Geotechnical Design						S							S	S	S	S		
Geospatial Engineering Branch						S							S	S	S	S		
General Engineering Branch						S							S	S	S	S		
Cost Engineering and Design						S							S	S	S	S		
Reports Branch																		
Contracting Division			R			R							R					
Office of Counsel			R			R							R					
Public Affairs Office			R			R							R					
Local Sponsors						S							R	S	S	S		
AR Game and Fish Commission				R		S							R	S	S	S		
AR Soil and Water Conservation Commission				R		S							R	S	S	S		
MO Department of Natural Resources				R		S							R	S	S	S		
MO Dept of Trans/AR Highway Trans Dept																		
AR Dept of Tourism and Parks																		
Other Federal Agencies																		
U.S. Geological Survey																		
U.S. Department of Agriculture, Natural Resources Conservation Service																		
Waterways Experiment Station																		

Appendix D

Organizational Breakdown Structure


Organization Breakdown Structure & Roles
White River Basin Comprehensive Study
Project Coordination Team
Sponsor
MVM - DE
•Provides oversight for study. Guides/Directs
•Resolves issues of priority/resources
•Approves management plan changes
• Resolves conflicts
MVM PRB
Congressional Coordination, Team Member Oversight
MVD
SWD
MVM
SWL
Stakeholder Coordination Team
Corps
USF&WL
EPA
Arkansas Resource Agencies
Missouri Resource Agencies
SWPA
NRCS
US Forest Service
Project Delivery Team
Project Manager - MVM
Lead Planner - MVM
Lead Planner - SWL
Environmental
Economics
Design
H&H
Cost
Local Sponsors
AGFC
ARSWCC
MODNR
•Works closely with PDT to assist in formulation/evaluation
•Reviews/comments
Command Oversight
MVD

Appendix E

Sponsor Cash Requirements

Fiscal Year Breakdown

Line Item Cost Estimate

Activity Number		Cost Estimate	Sponsor In-Kind
1100	Basin Ecosystem Resources and users Relationships (A concepetual model)	81,000	30,000
	BASIN ENVIRONMENTAL RESOURCES		
1200	Literature /Data Search	91,000	45,000
1300	Environmental Coordination	75,000	
1400	Environmental Appendix	32,000	
1500	Aquatic Ecosystems Sub-Basin Assessments	161,000	135,000
1600	Watershed Restoration Plans	495,000	200,000
1700	Aquatic Ecosystem-Wild & Scenic River and National Rivers	6,500	
1800	FWS Coordination	72,000	
1900	**Hydrologic Effects on Lower Basin Wetlands (King Study)**		
	Data required for the King Study	561,500	
1900.1	Satellite Imagery	0	
1900.2	Elevation Surveys 15 transects along the White, 3 along Bayou de View and 3 along the Cache River	200,000	
1900.3	Hydraulic modeling efforts	170,000	
1900.4	Stage/discharge on Cache River and Bayou DeView.	15,000	
1900.5	10-day average MSL stage on the Mississippi at the mouth of the White	8,000	
1900.6	Gather MSS or TM imagery on White River main stem, Cache River, and Bayou DeView	15,000	
	Other Environmental Resource Studies		
2000	Terrestrial Habitat Evaluation	40,000	30,000
2100	Wetlands Evaluation	40,000	30,000
2200	Migratory Birds	40,000	30,000
2300	Endangered/Threatened Species	40,000	30,000
2350	Evaluation of Permanent Wetlands in the Lower White River	205,000	
2400	**Evaluation Of Ecosystem Restoration Options Within Lower White River Basin (Heitmeyer Study)**	915,000	
2500	Navigation/Transportation Needs	235,000	215,000
2600	People and Economy	55,000	
2700	Recreation	250,000	210,000
	Water Uses		
2800	Groundwater-Agricultural Water Supply	182,000	162,500
2900	Water Supply/Wastewater Treatment	80,000	40,000
	GIS		
	Data Acquisition		
3000.0	Data Queries / Assistance from GIS - 11 Major Areas of Study		
	Contractors Communication / Assistance /Interaction		
	Administrative GIS Items (Presentations, Explanations, Coordination)	100,000	
	Pilot Project		
3000.1	Generate data and sample queries for one county within the project area	26,000	
	Data Management		
3000.2	Perform data integration of downloaded data to USACE Standards		
	Acquire one Computer data server / storage server including upgrades and maintenance for 4 years of project	67,000	

Line Item Cost Estimate

Activity Number		Cost Estimate	Sponsor In-Kind
3100	**Hydropower/Power Generation Needs**		
	A compilations of the existing data a studies involving hydropower and power generation needs in the basin will be made.	50,000	
3200	**Flood Control Assessment**		
	The existing data on basin flooding will be evaluated and literature sources including newspapers will be used to document the flooding potential in the basin.	400,000	60,000
3300	**Aquatic Ecosystem -Lakes/Reservoirs**		
3300.1	Quantify water quality in the Beaver Lake.	376,500	276,500
3300.2	Quantify water quality in the Table Rock Lake.	1,148,000	
3300.3	Quantify Water quality in Lake Taneycomo	330,000	
3300.4	Development of Hydrodynamic models of Beaver and Table Rock Lakes	147,600	147,600
3300.5	Aquatic Ecosystem Fishery Studies (Kilgore Study)	182,000	
	Habitat Improvement Bullshoals and Table Rock Lakes		
100	**PLANNING, AND PROJECT MANAGEMENT**		
100.1	Public Involvement	105,600	40,000
100.2	Study Management	405,400	167,925
100.3	Budget Preparation & Support	165,600	40,000
100.4	Plan Formulation and Evaluation	297,600	55,000
100.5	Prepare Draft of modern historic conditions, exisitng conditions, and future without project conditions portions of the Report.	40,200	
100.6	Preliminary Draft of Main Report	80,000	
100.7	Assemble/Print Preliminary Draft Report	8,000	
100.8	Technical Review	60,000	
100.9	Sponsor Review.	60,000	60,000
100.10	Revise/Print Preliminary Draft Report - CEMVD/OCE Review.	5,000	
100.11	Review Support	50,000	50,000
100.12	Prepare draft Study Plan	100,000	
100.13	Revise/Print Draft Report/PSP	20,000	
100.14	Prepare and Print Final Report	12,000	
100.15	Budget Preparation &Support	160,000	
100.16	Supervision and Review - Supervise all budget request	65,600	
100.17	Revise Draft Appendix - CEMVD/HQUSACE Review.	12,000	
100.18	Revise Draft Appendix - Public Review	2,000	
100.19	Final Appendix	2,000	
	Total	8,543,100	2,054,525
		Sponsor Cash 25%	2,135,775
		Federal Cash 50%	4,271,550

Fiscal Year Breakdown - White River Comprehensive Study

Activity Number		FY02 FED Work	FY02 Sponsor In-kind	FY03 FED Work	FY03 Sponsor In-kind	FY04 FED Work	FY04 Sponsor In-kind	FY05 FED Work	FY05 Sponsor In-kind	FY06 FED Work	FY06 Sponsor In-kind	Row Total
1100	Basin Ecosystem Resources and users Relationships (A concepetual model)	51,000	30,000									81,000
	BASIN ENVIRONMENTAL RESOURCES											
1200	Literature /Data Search		20,000	11,500	25,000	11,500		11,500		11,500		91,000
1300	Environmental Coordination			18,750		18,750		18,750		18,750		75,000
1400	Environmental Appendix									32,000		32,000
1500	Aquatic Ecosystems Sub-Basin Assessments			13,000	67,500	13,000	67,500					161,000
1600	Watershed Restoration Plans			147,500	100,000	147,500	100,000					495,000
1700	Aquatic Ecosystem-Wild & Scenic River and National Rivers					6,500						6,500
1800	FWS Coordination			18,000		18,000		18,000		18,000		72,000
1900	**Hydrologic Effects on Lower Basin Wetlands (King Study)**	55,000		177,000		148,000		148,000		33,500		561,500
	Data required for the King Study											
1900.1	Satellite Imagery											
1900.2	Elevation Surveys 15 transects along the White, 3 along Bayou de View and 3 along the Cache River			200,000								200,000
1900.3	Hydraulic modeling efforts			170,000								170,000
1900.4	Stage/discharge on Cache River and Bayou DeView.			15,000								15,000
1900.5	10-day average MSL stage on the Mississippi at the mouth of the White			8,000								8,000
1900.6	Gather MSS or TM imagery on White River main stem, Cache River, and Bayou DeView			15,000								15,000
	Other Environmental Resource Studies											
2000	Terrestrial Habitat Evaluation				15,000	5,000	15,000	5,000				40,000
2100	Wetlands Evaluation				15,000	5,000	15,000	5,000				40,000
2200	Migratory Birds				15,000	5,000	15,000	5,000				40,000
2300	Endangered/Threatened Species				15,000	5,000	15,000	5,000				40,000
2,350	Evaluation of Permanent Wetlands in the Lower White River			80,000		125,000						205,000
2400	**Evaluation Of Ecosystem Restoration Options Within Lower White River Basin (Heitmeyer Study)**	55,000		259,750		234,750		209,750		155,750		915,000
2500	Navigation/Transportation Needs					10,000	100,000	10,000	115,000			235,000
2600	People and Economy					27,000		28,000				55,000
2700	Recreation				110,000	20,000	100,000	20,000				250,000
	Water Uses											
2800	Groundwater-Agricultural Water Supply				82,500	10,000	80,000	9,500				182,000
2900	Water Supply/Wastewater Treatment					20,000	20,000	20,000	20,000			80,000

Fiscal Year Breakdown - White River Comprehensive Study

Activity Number		FY02 FED Work	FY02 Sponsor In-kind	FY03 FED Work	FY03 Sponsor In-kind	FY04 FED Work	FY04 Sponsor In-kind	FY05 FED Work	FY05 Sponsor In-kind	FY06 FED Work	FY06 Sponsor In-kind	Row Total
3000	**GIS**											
3000.1	Data Queries / Assistance from GIS - 11 Major Areas of Study			5,000	20,000	5,000	20,000	5,000	20,000	5,000	20,000	100,000
	Contractors Communication / Assistance /Interaction											
	Administrative GIS Items (Presentations, Explanations, Coordination)											
3100	**Hydropower/Power Generation Needs**											
	A compilations of the existing data a studies involving hydropower and power generation needs in the basin will be made.									50,000		50,000
3300	**Aquatic Ecosystem -Lakes/Reservoirs**											
3300.1	Quantify water quality in the Beaver Lake. In-kind services		137,300		111,200	100,000	28,000					376,500
3300.2	Quantify water quality in the Table Rock Lake.			379,000		530,000		239,000				1,148,000
3300.3	Quantify Water quality in Lake Taneycomo			75,000		125,000		130,000				330,000
3000.4	Development of Hydrodynamic models of Beaver and Table Rock Lakes		147,600									147,600
3000.5	Aquatic Ecosystem Fishery Studies (Kilgore Study)	34,000		60,000		60,000		28,000				182,000
	Habitat Improvement in Bullshoals and Table Rock Lakes											

Fiscal Year Breakdown - White River Comprehensive Study

Activity Number		FY02 FED Work	FY02 Sponsor In-kind	FY03 FED Work	FY03 Sponsor In-kind	FY04 FED Work	FY04 Sponsor In-kind	FY05 FED Work	FY05 Sponsor In-kind	FY06 FED Work	FY06 Sponsor In-kind	Row Total
100	PLANNING, AND PROJECT MANAGEMENT											
100.1	Public Involvement		10,000	13,000	10,000	17,400	10,000	17,600	10,000	17,600		105,600
100.2	Study Management	30,000	30,000	50,500	40,000	54,900	40,000	47,500	40,000	54,575	17,925	405,400
100.3	Budget Preparation & Support	10,000	10,000	26,000	10,000	30,400	10,000	29,600	10,000	29,600		165,600
100.4	Plan Formulation and Evaluation	40,000	10,000	45,000	15,000	52,400	15,000	52,600	15,000	52,600		297,600
100.5	Prepare Draft of modern historic conditions, existing conditions, and future without project conditions portions of the Report.							22,600		17,600		40,200
100.6	Preliminary Draft of Main Report							40,000		40,000		80,000
100.7	Assemble/Print Preliminary Draft Report									8,000		8,000
100.8	Technical Review									60,000		60,000
100.9	Sponsor Review.										60,000	60,000
100.10	Revise/Print Preliminary Draft Report - CEMVD/OCE Review.									5,000		5,000
100.11	Review Support										50,000	50,000
100.12	Prepare draft Study Plan	100,000										100,000
100.13	Revise/Print Draft Report/PSP							10,000		10,000		20,000
100.14	Prepare and Print Final Report									12,000		12,000
100.15	Budget Preparation &Support			40,000		40,000		40,000		40,000		160,000
100.16	Supervision and Review - Supervise all budget request			13,000		17,400		17,600		17,600		65,600
100.17	Revise Draft Appendix - CEMVD/HQUSACE Review.									12,000		12,000
100.18	Revise Draft Appendix - Public Review									2,000		2,000
100.19	Final Appendix									2,000		2,000
	Total	**375,000**	**394,900**	**1,840,000**	**651,200**	**1,562,500**	**650,500**	**1,193,000**	**230,000**	**705,075**	**147,925**	**8,050,100**
	Sponsor In-Kind		**394,900**		**651,200**		**650,500**		**230,000**		**147,925**	**2,074,525**
	Sponsor Cash	**0**		**420,000**		**957,000**		**687,000**		**35,225**		**2,028,775**
	Fed Appropriations	**375,000**		**1,528,250**		**1,013,750**		**614,250**		**740,300**		**4,025,050**

10/22/2001 1:00 PM 3

Appendix F

Open Plan Activity Network

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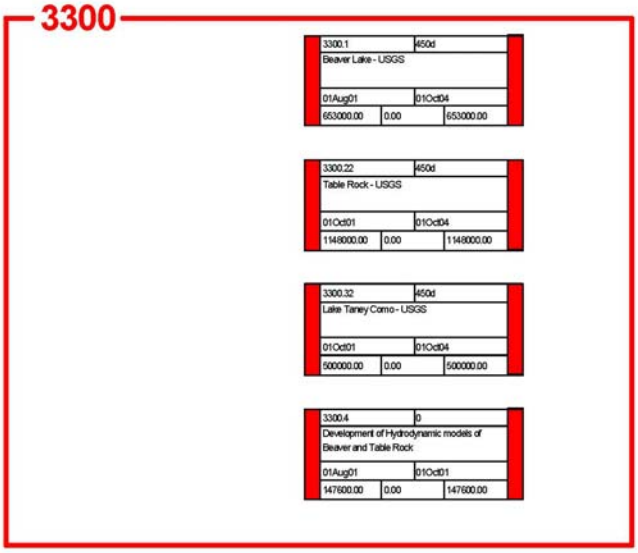
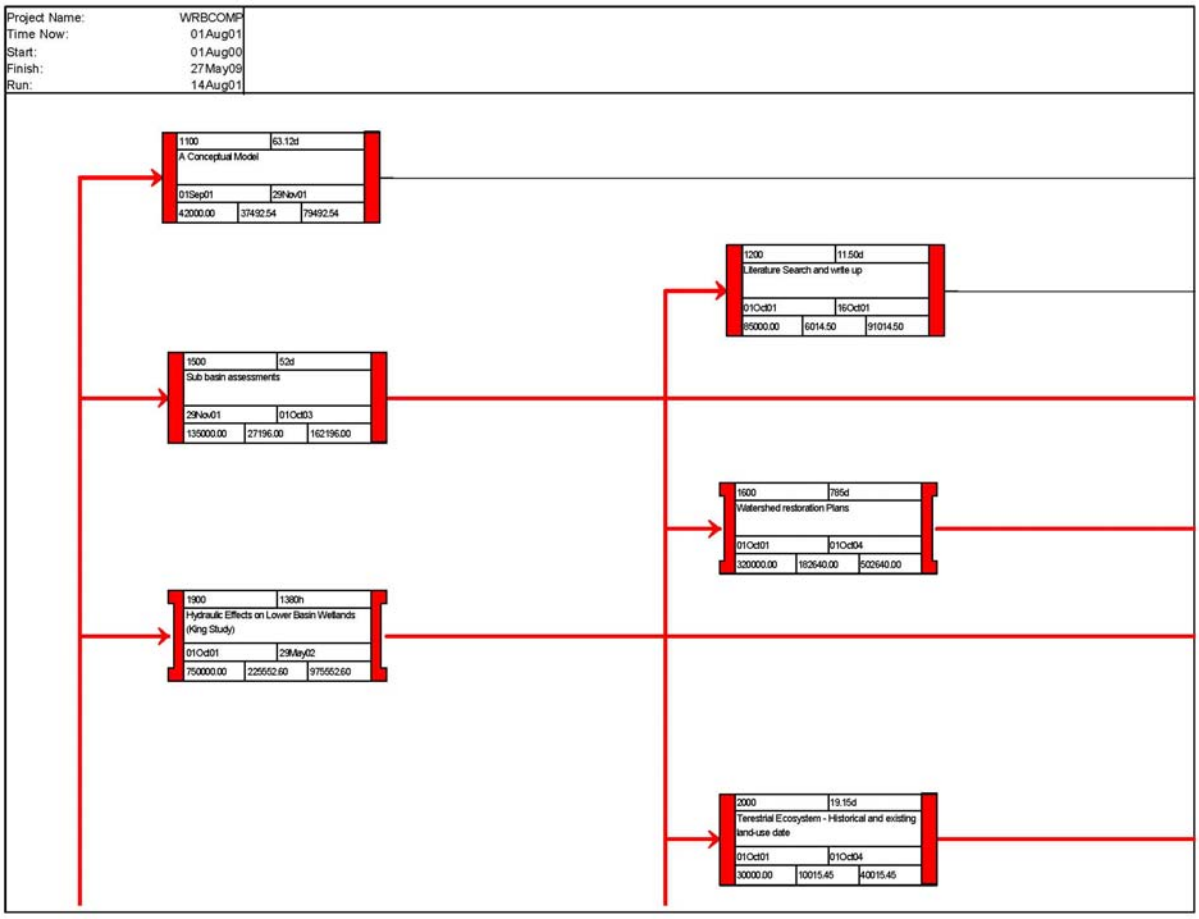
Finish:	27May09
Run:	14Aug01

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Run: 14Aug01
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A Conceptual Model
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79492.54
1200
11.50d
Literature Search and write up
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16Oct01
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6014.50
91014.50
1500
52d
Sub basin assessments
29Nov01
01Oct03
135000.00
27196.00
162196.00
1600
785d
Watershed restoration Plans
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01Oct04
320000.00
182640.00
502640.00
1900
1380h
Hydraulic Effects on Lower Basin Wetlands (King Study)
01Oct01
29May02
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225552.60
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19.15d
Terestrial Ecosystem - Historical and existing land-use date
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01Oct04
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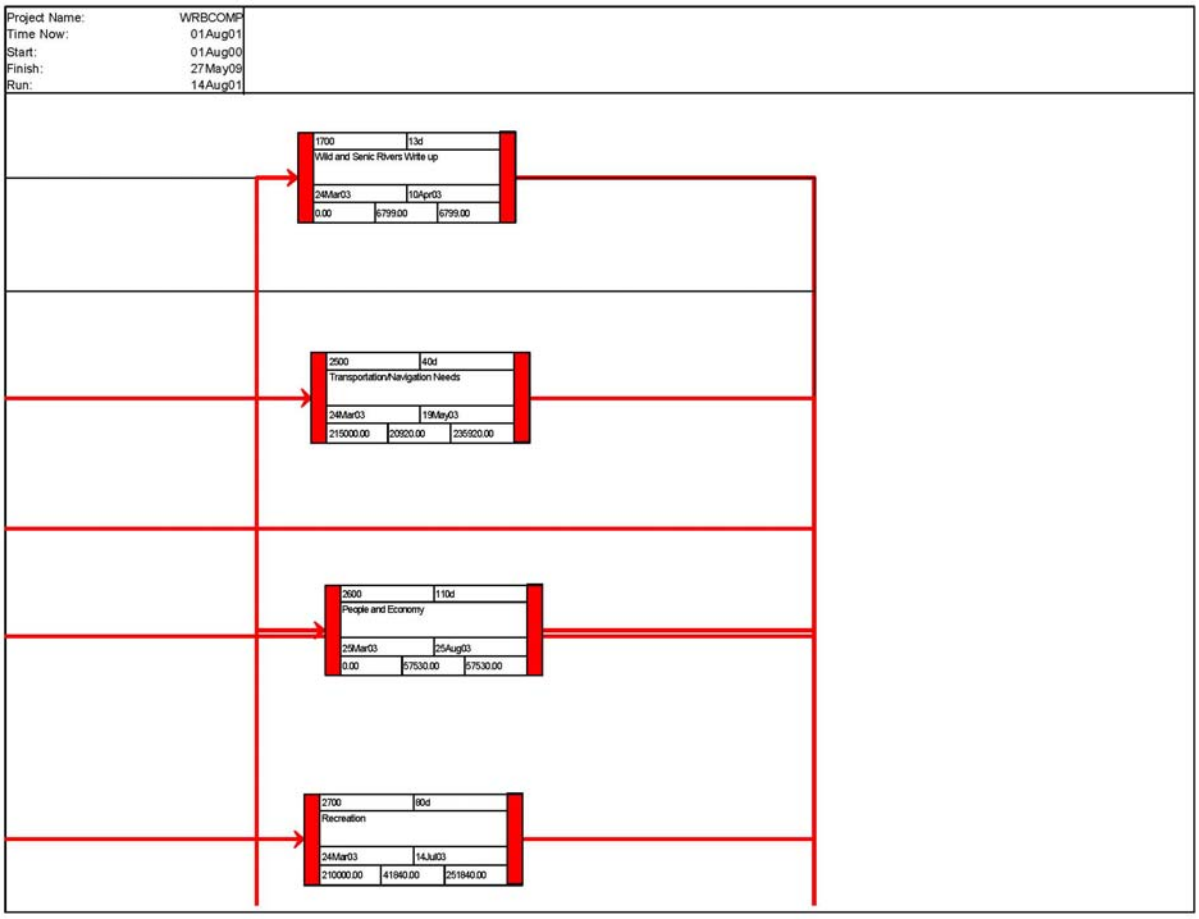
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Finish: 27May09
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Wild and Senic Rivers Write up
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2500
40d
Transportation/Navigation Needs
24Mar03
19May03
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2600
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People and Economy
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Recreation
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14Jul03
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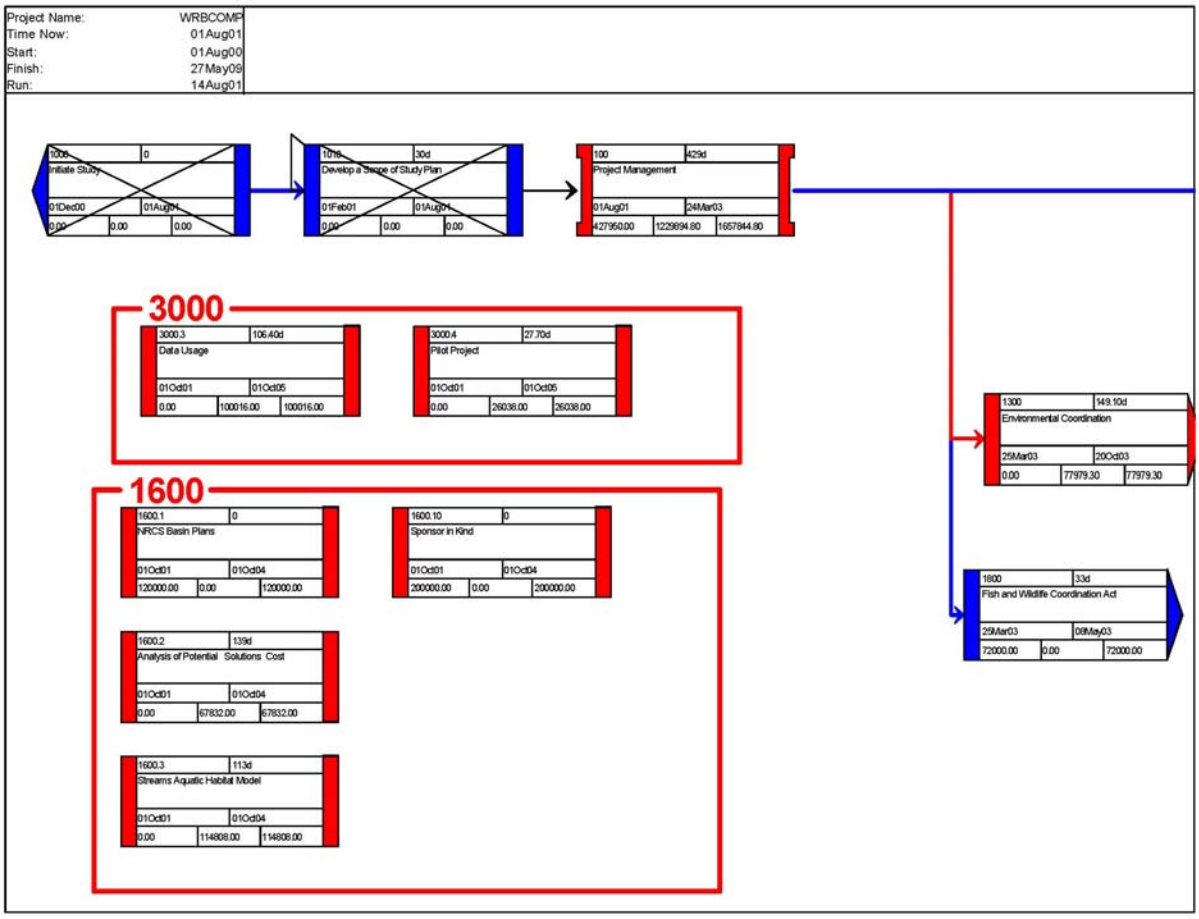
Run:	14Aug01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Initiate Study
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30d
Develop a Scope of Study Plan
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Project Management
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Data Usage
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3000.4
27.70d
Pilot Project
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01Oct05
0.00
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26038.00
1600
1600.1
0
NRCS Basin Plans
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01Oct04
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0.00
120000.00
1600.10
0
Sponsor in Kind
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01Oct04
200000.00
0.00
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1600.2
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Analysis of Potential Solutions Cost
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Streams Aquatic Habitat Model
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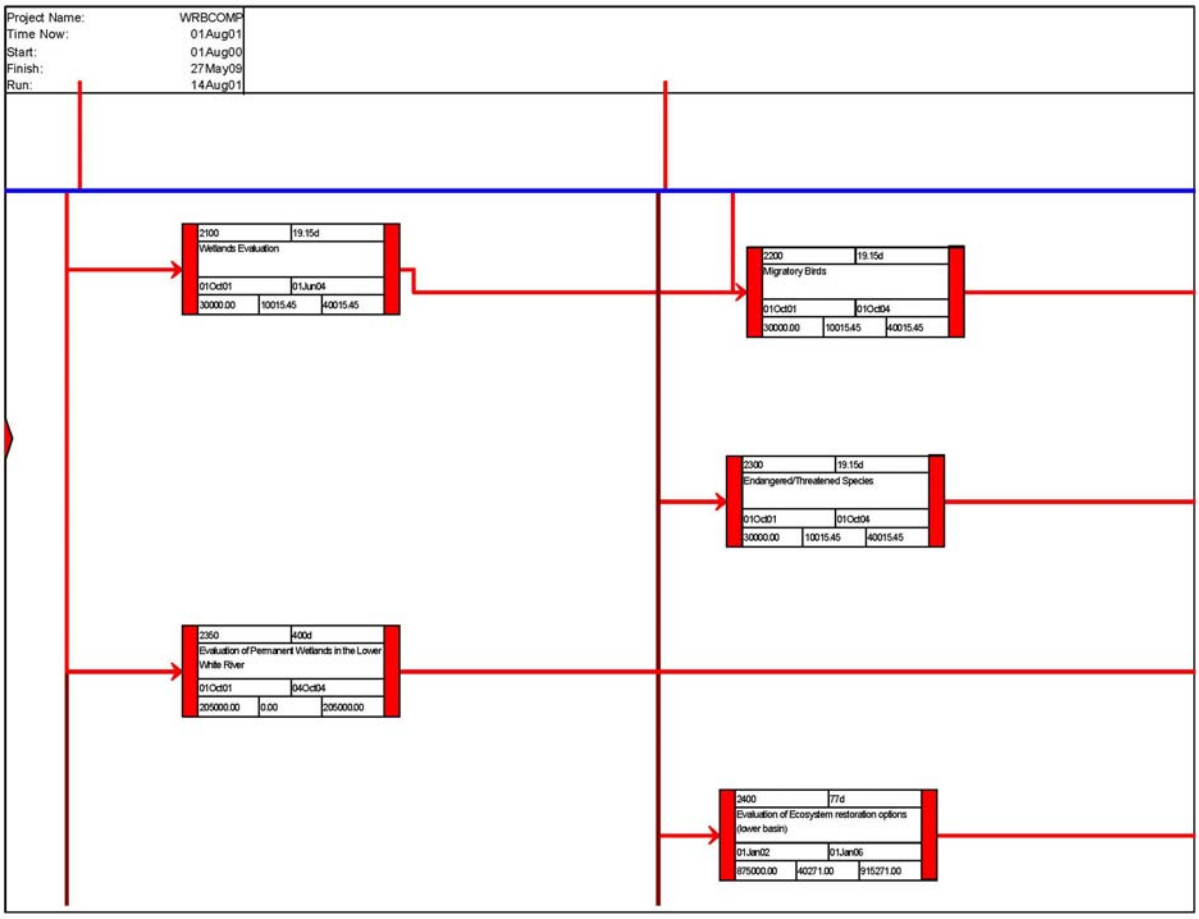
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2200 19.15d
Migratory Birds
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2300 19.15d
Endangered/Threatened Species
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2350 400d
Evaluation of Permanent Wetlands in the Lower White River
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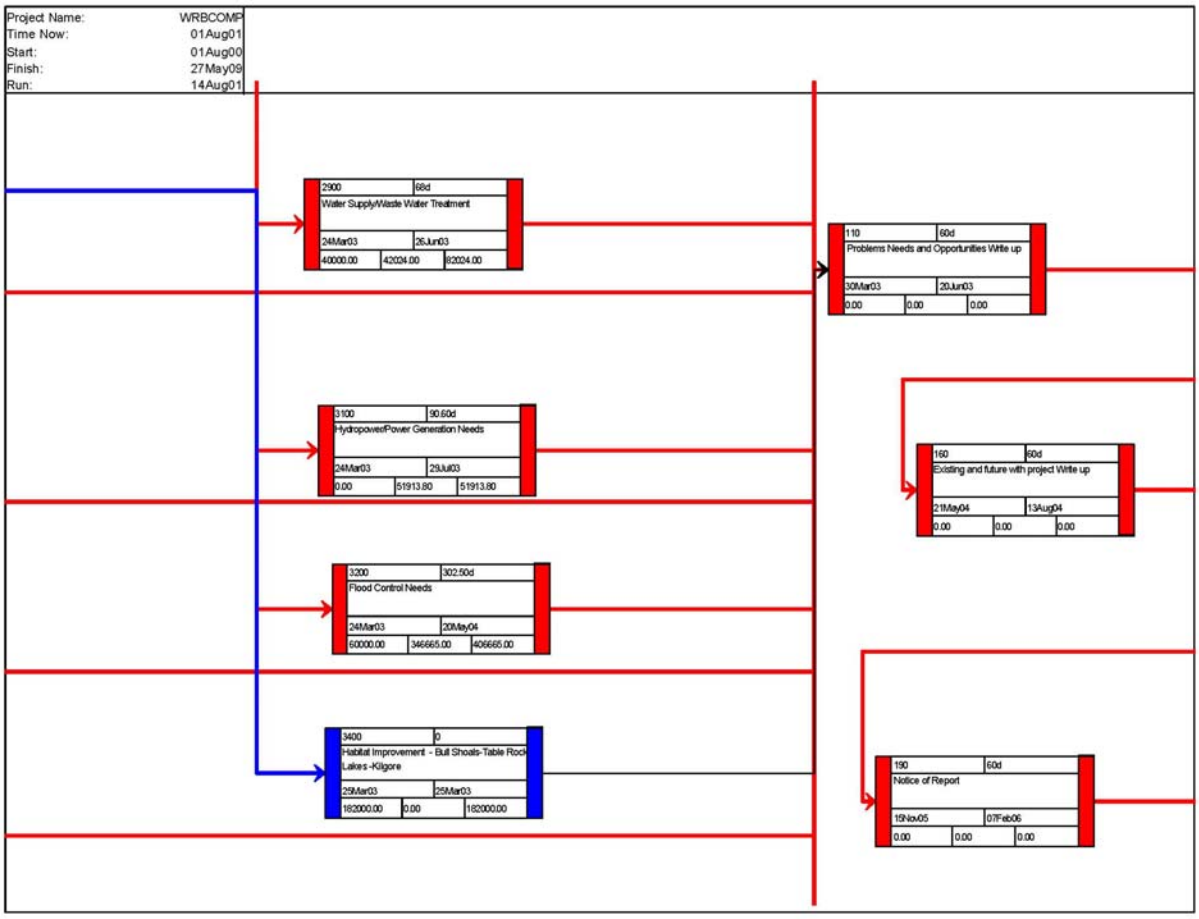
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Water Supply/Waste Water Treatment
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26Jun03
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82004.00
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Problems Needs and Opportunities Write up
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20Jun03
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Hydropower/Power Generation Needs
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Existing and future with project Write up
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13Aug04
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Flood Control Needs
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Habitat Improvement - Bull Shoals-Table Rock Lakes-Kilgore
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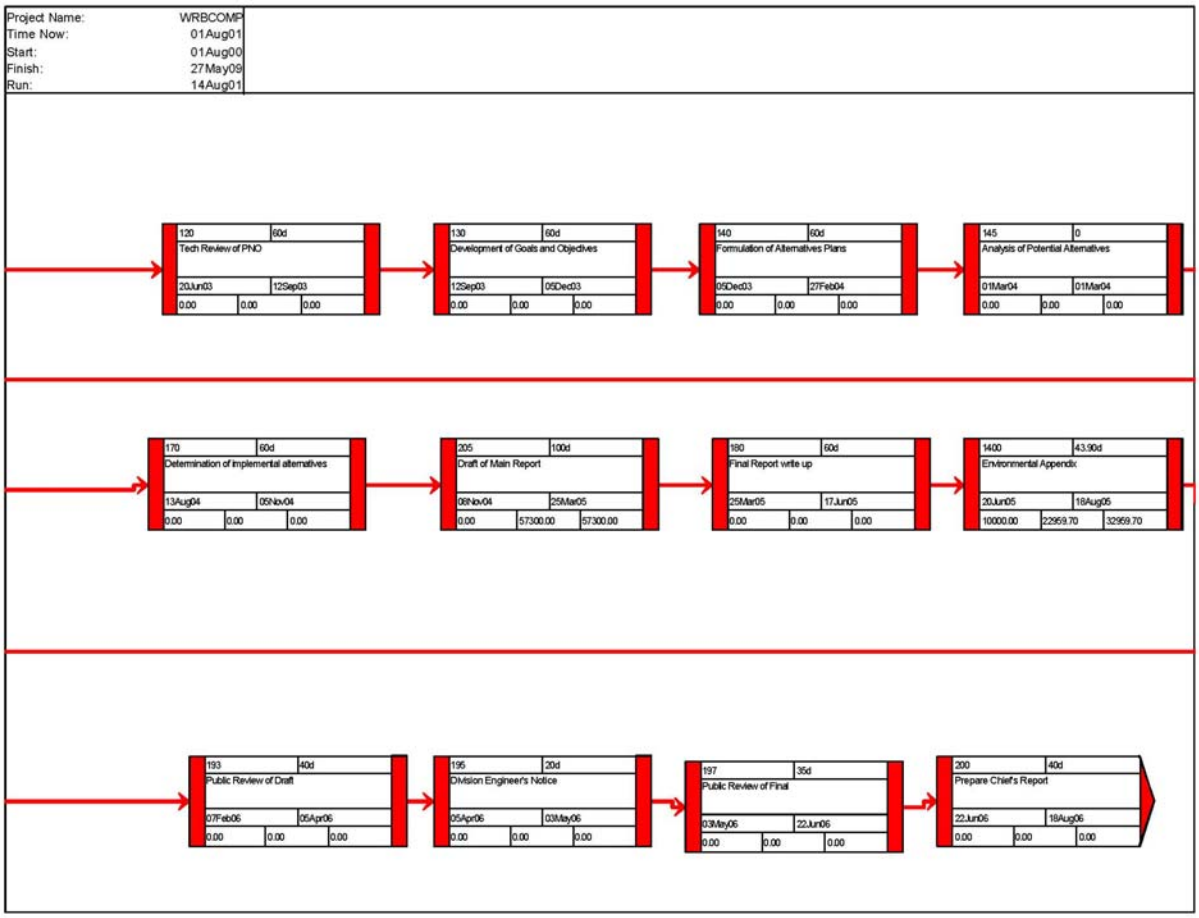
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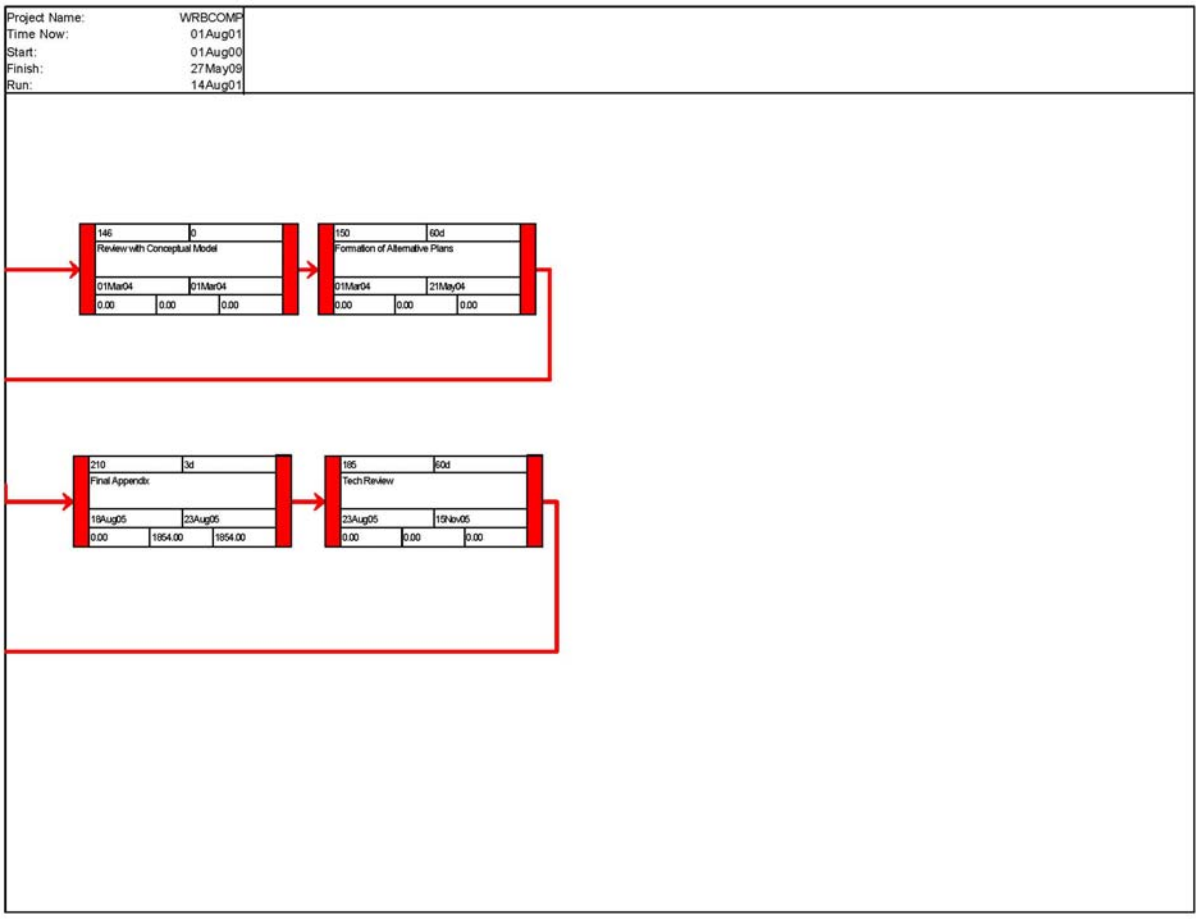
Time Now: 01Aug01
Start: 01Aug00
Finish: 27May09
Run: 14Aug01
120 60d Tech Review of PNO 20Jun03 12Sep03 0.00 0.00 0.00
130 60d Development of Goals and Objectives 12Sep03 05Dec03 0.00 0.00 0.00
140 60d Formulation of Alternatives Plans 05Dec03 27Feb04 0.00 0.00 0.00
145 0 Analysis of Potential Alternatives 01Mar04 01Mar04 0.00 0.00 0.00
170 60d Determination of implemental alternatives 13Aug04 05Nov04 0.00 0.00 0.00
205 100d Draft of Main Report 08Nov04 25Mar05 0.00 57300.00 57300.00
180 60d Final Report write up 25Mar05 17Jun05 0.00 0.00 0.00
1400 43.90d Environmental Appendix 20Jun05 18Aug05 10000.00 22959.70 32959.70
193 40d Public Review of Draft 07Feb06 05Apr06 0.00 0.00 0.00
195 20d Division Engineer's Notice 05Apr06 03May06 0.00 0.00 0.00
197 35d Public Review of Final 03May06 22Jun06 0.00 0.00 0.00
200 40d Prepare Chief's Report 22Jun06 18Aug06 0.00 0.00 0.00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Finish: 27May09
Run: 14Aug01
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Review with Conceptual Model
01Mar04
01Mar04
0.00
0.00
0.00
150
60d
Formation of Alternative Plans
01Mar04
21May04
0.00
0.00
0.00
210
3d
Final Appendix
18Aug05
23Aug05
0.00
1854.00
1854.00
185
60d
Tech Review
23Aug05
15Nov05
0.00
0.00
0.00

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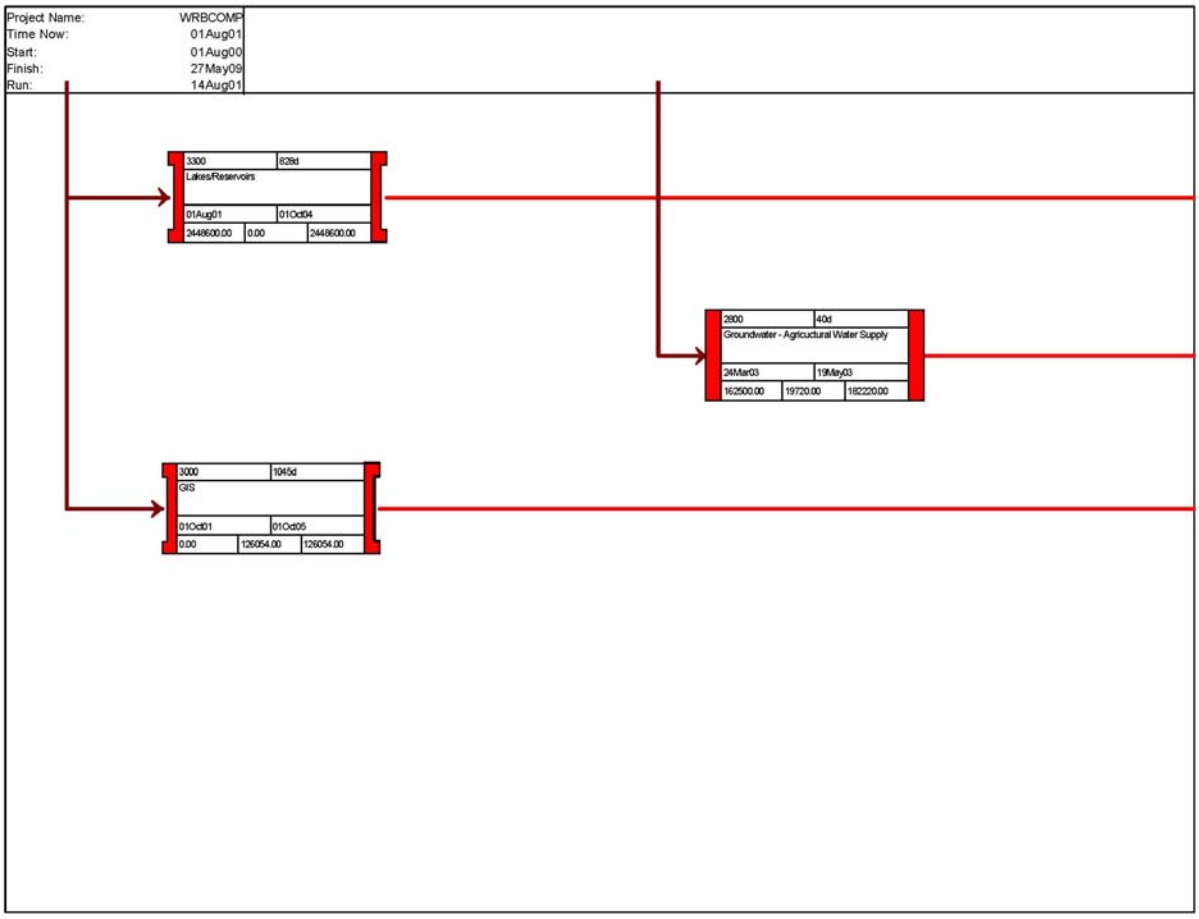
Finish:	27May09
Run:	14Aug01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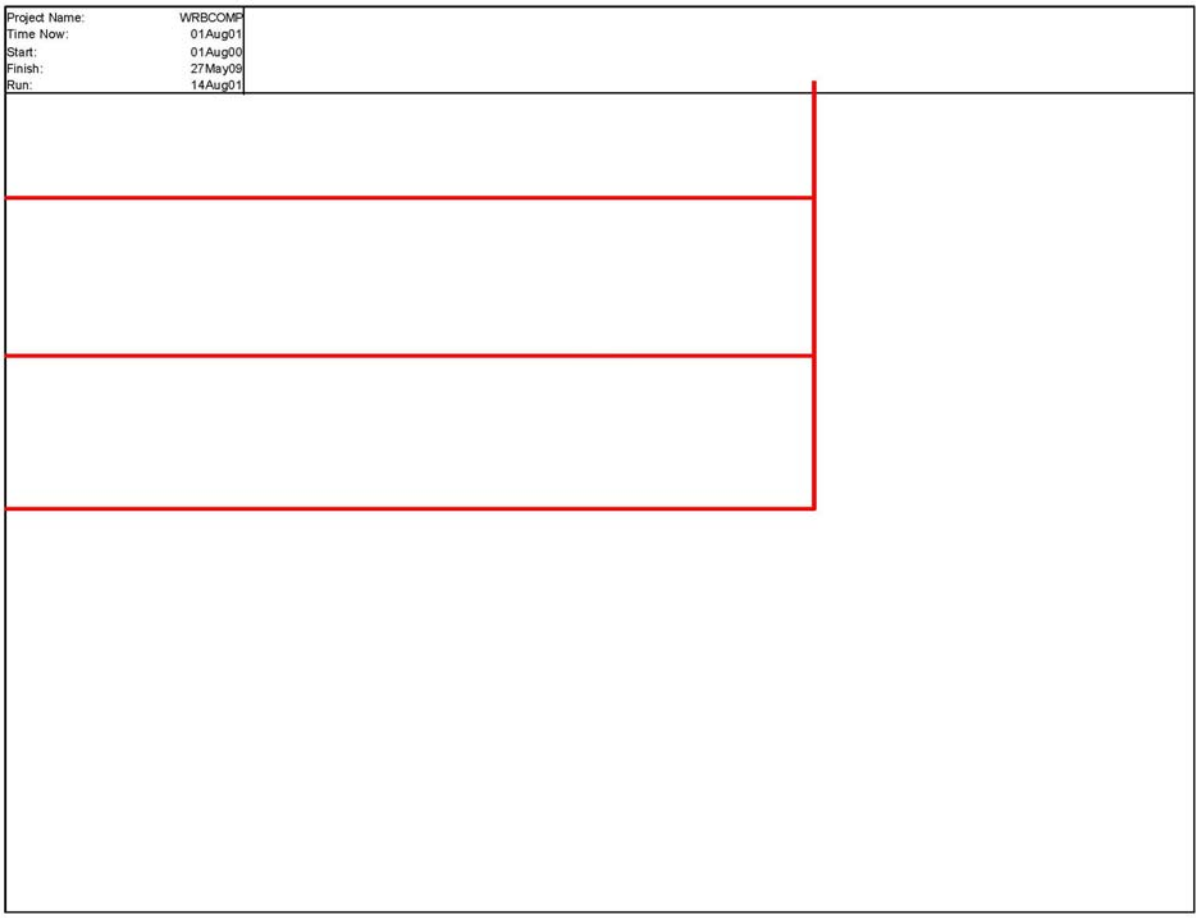
Finish: 27May09
Run: 14Aug01
3300
828d
Lakes/Reservoirs
01Aug01
01Oct04
2448600.00
0.00
2448600.00
2800
40d
Groundwater - Agricultural Water Supply
24Mar03
19May03
162500.00
19720.00
18220.00
3000
1045d
GIS
01Oct01
01Oct05
0.00
126054.00
126054.00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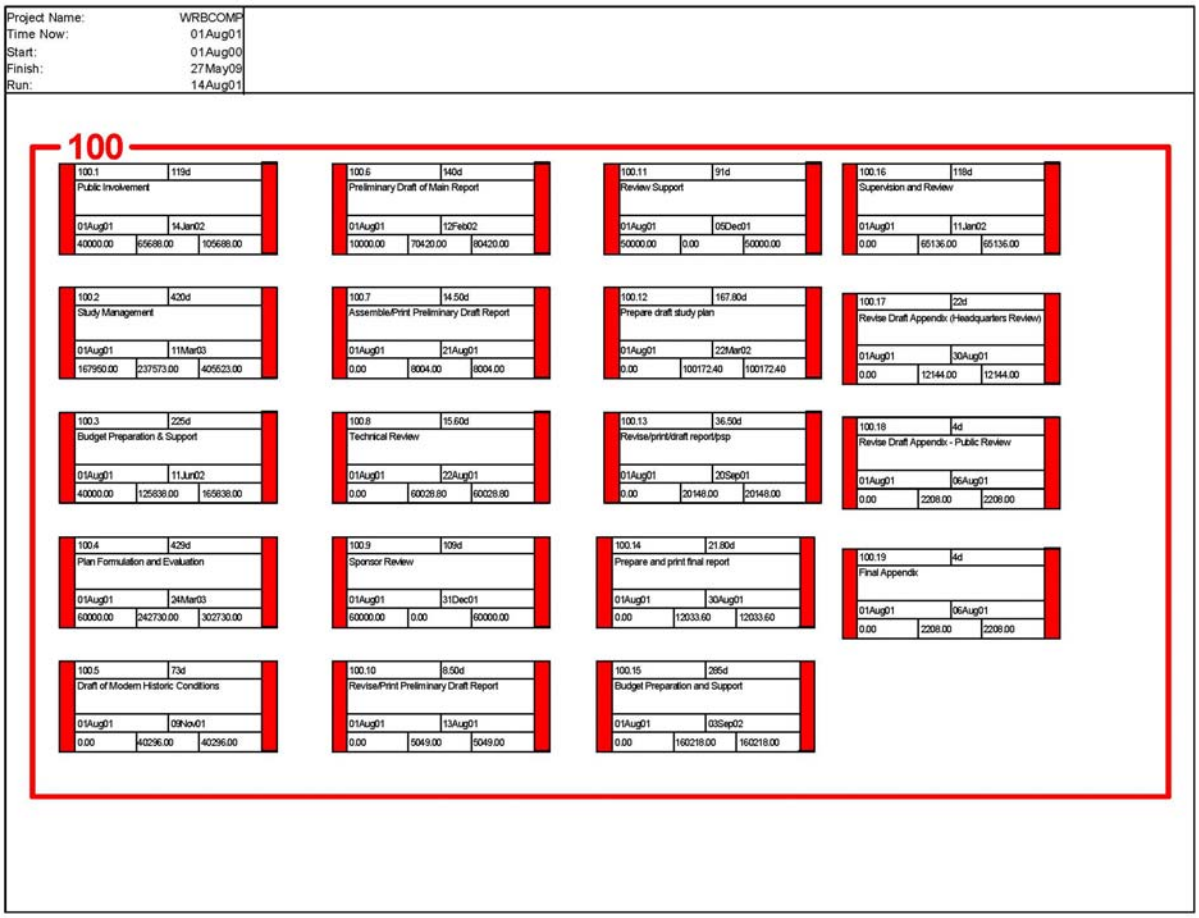
Finish: 27May09
Run: 14Aug01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100
100.1 119d
Public Involvement
01Aug01 14Jan02
40000.00 65688.00 105688.00
100.6 140d
Preliminary Draft of Main Report
01Aug01 12Feb02
10000.00 70420.00 80420.00
100.11 91d
Review Support
01Aug01 05Dec01
50000.00 0.00 50000.00
100.16 118d
Supervision and Review
01Aug01 11Jan02
0.00 65136.00 65136.00
100.2 420d
Study Management
01Aug01 11Mar03
167950.00 237573.00 405523.00
100.7 14.50d
Assemble/Print Preliminary Draft Report
01Aug01 21Aug01
0.00 8004.00 8004.00
100.12 167.80d
Prepare draft study plan
01Aug01 22Mar02
0.00 100172.40 100172.40
100.17 22d
Revise Draft Appendix (Headquarters Review)
01Aug01 30Aug01
0.00 12144.00 12144.00
100.3 225d
Budget Preparation & Support
01Aug01 11Jun02
40000.00 125838.00 165838.00
100.8 15.60d
Technical Review
01Aug01 22Aug01
0.00 60028.80 60028.80
100.13 36.50d
Revise/print/draft report/psp
01Aug01 20Sep01
0.00 20148.00 20148.00
100.18 4d
Revise Draft Appendix - Public Review
01Aug01 06Aug01
0.00 2208.00 2208.00
100.4 429d
Plan Formulation and Evaluation
01Aug01 24Mar03
60000.00 242730.00 302730.00
100.9 109d
Sponsor Review
01Aug01 31Dec01
60000.00 0.00 60000.00
100.14 21.80d
Prepare and print final report
01Aug01 30Aug01
0.00 12033.60 12033.60
100.19 4d
Final Appendix
01Aug01 06Aug01
0.00 2208.00 2208.00
100.5 73d
Draft of Modern Historic Conditions
01Aug01 09Nov01
0.00 40296.00 40296.00
100.10 8.50d
Revise/Print Preliminary Draft Report
01Aug01 13Aug01
0.00 5049.00 5049.00
100.15 265d
Budget Preparation and Support
01Aug01 03Sep02
0.00 160218.00 160218.00

Appendix G

Escrow Agreement Model

ESCROW AGREEMENT

This Agreement, made and entered into this _____ day of _____, 19___, by and between the Arkansas Soil and Water Conservation Commission (hereinafter referred to as the "Non-Federal Sponsor"), the Department of the Army (hereinafter referred to as the "Government"), and **[FULL NAME OF THE INSTITUTION]** (hereinafter referred to as the "Bank"),

WITNESSETH THAT:

WHEREAS, on August 4, 2000, the Non-Federal Sponsor and the Government entered into a Project Cooperation Agreement for the construction of the Grand Prairie Area Separable Element of the Grand Prairie Region and Bayou Meto Basin Project; and,

WHEREAS, pursuant to the Project Cooperation Agreement, the Non-Federal Sponsor is required to contribute, over the period of construction of the Project, a cash contribution calculated in accordance with said Agreement; and,

WHEREAS, the Non-Federal Sponsor and the Government have agreed that the required contribution may be deposited into an escrow account and held therein until the Government withdraws the funds in accordance with the Project Cooperation Agreement; and,

WHEREAS, the Bank has agreed to serve as depositary for the escrow account and to accept appointment as escrow agent.

NOW, THEREFORE, the parties agree as follows:

1. The Bank is hereby appointed as the escrow agent for the Non-Federal Sponsor and is designated the depositary for the monies delivered by the Sponsor pursuant to the aforementioned Project Cooperation Agreement. The Bank shall establish the "Grand Prairie Area Demonstration Project Construction Fund" (hereinafter referred to as the "Escrow Account"), into which shall be deposited the funds delivered by the Non-Federal Sponsor.

2. In accordance with the method of payment provisions of the Project Cooperation Agreement, the Non-Federal Sponsor shall absolutely and irrevocably deliver to the Bank the funds required to be provided to the Government during the construction period.

3. The funds held in the Escrow Account shall earn interest at a rate as the Bank and the Non-Federal Sponsor may mutually agree. To the extent the Non-Federal Sponsor authorizes the Bank to invest the funds in any instrument other than an interest-bearing account, savings certificate, or certificate of deposit of the Bank itself, such investment shall be only in direct obligations of the Government of the United States of America or in obligations of agencies or insurers that are guaranteed by the Government of the United States of America. Any instrument must be subject to redemption on or prior to the dates the funds will be needed by the Government. Interest on the funds deposited shall accrue and belong to the Non-Federal Sponsor, and shall be payable to the Non-Federal Sponsor as the Bank and the Non-Federal Sponsor may agree.

4. The Government, acting pursuant to the terms of the Project Cooperation Agreement, shall have the sole and unrestricted right to draw upon all or any part of the principal funds deposited in the

Escrow Account. A written demand for withdrawal shall be made to the Bank by the District Engineer, USAED, Memphis, or his designee, with a copy of said demand provided to the Non-Federal Sponsor. Within 10 days of receipt of the demand, the Bank shall pay to the Government the amount requested to the extent such amount does not exceed the balance available in the Escrow Account. All payments shall be in the form of bank drafts payable to the "FAO, USAED, Memphis", and shall be mailed or otherwise delivered to the Government as specified below in paragraph 9.

5. Upon receipt of signed certification by the Government that no further demand for payment of money will be made, the Bank shall complete a final accounting of other obligations required under this Agreement, and pay over any remaining balance to the Sponsor.

6. The fee to be paid to the Bank for the services provided hereunder shall be as the Bank and the Non-Federal Sponsor may mutually agree. Any fee paid to the Bank shall be the sole responsibility of the Non-Federal Sponsor. The Bank shall have no right to deduct monies from the principal escrow sum to pay for its services. In the event the Non-Federal Sponsor fails to make payment to the Bank for its services, all claims for such payment shall be directly against the Non-Federal Sponsor. The Government shall not be responsible for any costs attributable to the establishment, maintenance, administration, or any other aspect of the Escrow Account.

7. Account statements shall be rendered by the Bank to the Non-Federal Sponsor and the Government once monthly, and shall show deposits, disbursements, and balances, and the dates thereof. Upon receipt by the Bank of the certification specified in paragraph 5 above, the Bank shall prepare a final accounting showing all transactions relating to the Escrow Account and provide said accounting to the Non-Federal Sponsor and the Government at the addresses shown in paragraph 9.

8. It is understood and agreed that the bank shall not be liable or responsible to ascertain the terms or conditions of any provision of the aforementioned Project Cooperation Agreement between the Non-Federal Sponsor and the Government. It is further understood and agreed that if any controversy arises between the Government and the Non-Federal Sponsor, or with any other party with respect to the subject matter of this Agreement, the Bank is authorized, unless precluded by order of a court of competent jurisdiction, to disburse monies to the Government in accordance with the terms of this Agreement.

9. All notices, requests, demands, and other communications required or permitted to be given under this Agreement shall be deemed to have been duly given if in writing and delivered personally, given by prepaid telegram, or mailed by first-class (postage pre-paid), registered, or certified mail, as follows:

If to the Non-Federal Sponsor:

Executive Director
Arkansas Soil and Water Conservation Commission
101 East Capitol, Suite 350
Little Rock, Arkansas 72201

If to the Government:

District Engineer
U.S. Army Corps of Engineers, Memphis District
167 North Main Street, Room B-202
Memphis, Tennessee 38103-1894

If to the Bank:
[FULL ADDRESS]

_____

_____

_____

_____

10. Nothing in this Agreement shall be considered as vesting title in the Bank to the amount deposited, except as Trustee for the Non-Federal Sponsor and the Government for the purposes set forth herein. Title to said funds shall not vest in the Government until payment to the Government is made as provided herein.

11. This Agreement shall take effect upon the initial deposit of funds into the Escrow Account by the Non-Federal Sponsor and shall continue in full force until the certification specified in paragraph 5 hereof is received by the Bank and the balance remaining is returned to the Non-Federal Sponsor, unless earlier terminated by the written mutual agreement of the Non-Federal Sponsor and the Government.

12. This Agreement may not be amended, except by written modification signed by the parties hereto.

IN WITNESS WHEREOF, the Non-Federal Sponsor, the Government, and the Bank have executed this Agreement on the date first above written.

The Non-Federal Sponsor

ATTEST: _____ BY: _____

The Department of the Army

ATTEST: _____ BY: _____

The Bank

ATTEST: _____ BY: _____

Appendix H

Quality Control Plan

QUALITY CONTROL PLAN

GENERAL

The quality control plan (QCP) for the White River Basin Comprehensive Study (WRBC) provides a technical review mechanism insuring quality products are developed during the course of the study by the Memphis District (MVM) and the Little Rock District (SWL). Technical review will consist of a single level study review and will be performed throughout the course of the study. The Mississippi Valley Division (MVD) will be responsible for verifying that MVM and SWL's products meet the needs and expectations of the customer, and that competent resources are utilized throughout the design and review process. One level of policy review for the WRBC will be performed at the Headquarters of the United States Army Corps of Engineers (HQUSACE), and will insure that all applicable statutes have been applied with respect to project purpose and budget criteria. All processes, quality assurance, and policy review should complement each other producing a seamless review process, which identifies and resolves technical and policy issues during the course of the study and not during the final study stages.

The QCP has been formulated to provide a sound technical review process at the District level, focusing on several objectives. Primarily, quality technical products will be produced through an effective and comprehensive single level technical review process throughout product development while verifying that all; legal, safety, health and environmental requirements are satisfied. This review process will insure that a cost effective solution, while maintaining product requirements, is developed. Technical review will also act as a mechanism to avoid starting over and redesign efforts, and will assure accountability for the technical quality of the product. Each technical review objective in the QCP will be satisfied through a review process performed by the District (technical review), MVD (quality assurance of technical products), and HQUSACE (policy review). The scope of the WRBC QCP is based upon applicable guidance from higher authority including the Report of the Task on Technical Review, dated December 1994, and CELMV-ET memorandum of 23 September 1995, Subject: Lower Mississippi Valley Division, Directorate of Engineering and Technical Services, Quality Control and Quality Assurance Guidance.

TECHNICAL REVIEW

Based upon cost, technical expertise, and current and projected workload, the technical review for the WRBC will be conducted by in-house and out-of-house resources with technical expertise in a specific area. In-house technical review, when resources allow, is expected to result in a lower project and review cost when compared to non-Corps contractual services, thereby adding value to the project and yielding the most cost effective method for technical review.

TECHNICAL REVIEW TEAM (TRT)

The TRT for Planning, Programs, and Project Management and Engineering Divisions will be responsible for performing an independent technical review. The TRT will be established at the initial stages of the study and will be maintained to the maximum extent possible during the life

of the study. At the initial study stages, the TRT will consist of one or more reviewers from each functional area within each division, and will consist of existing senior staff that perform other technical work but are not involved in the technical products under review. The TRT will be comprised of the same disciplines as the project team, and will have experience in the type of analyses in which they are responsible for reviewing. Each TRT member will be senior or equal in experience to the analyst or production person. The TRT will be responsible for verifying: 1) assumptions, 2) methods, procedures, and material used in the analyses based on the level of analyses, 3) alternatives evaluated are reasonable, 4) appropriateness of data used, and level of data obtained, 5) reasonableness of results, and 6) products meet customer needs and are consistent with law and existing policy. The makeup of the TRT may be modified as the study progresses to match the review requirements. The changes to the TRT may result in the use of additional out-of-house resources.

Planning, Programs, and Project Management Division (PPPMD) Technical Review Members

Technical Review Members will be from all functional areas within PPPMD, which include Planning, Environmental and Economics. One or more reviewers on the TRT will represent each functional area from the various disciplines. Thus, a minimum of three members from PPPMD will reside on the TRT for the WRBC.

Engineering Division Technical Review Members

The Technical Review Members will be selected from the various engineering and design offices. The members may change as the project progresses and specific project features are better defined. The TRT will consist of a Technical Reviewer Manager (TRM) and representatives from the various engineering design offices. The engineering design offices include Design Branch, Geotechnical Branch, and Hydraulics and Hydrologic Branch. One or more reviewers on the TRT will represent each branch from the various disciplines within that branch. There will be a minimum of seven Engineering members on the TRT for the WRBC.

The WRBC Technical Review Team comprised of Planning, Programs, and Project Management, Engineering, Construction-Operations, and Real Estate Divisions and Office of Counsel will consist, as a minimum, of the following disciplines:

White River Basin-Wide Comprehensive Study
Technical Review Team Members

Memphis District

Name	Technical Area
Mr. Hubert Logan	Civil Design
Mr. Michael Callaway	Geotechnical Design
Mr. Dewey Jones	Hydrology and Hydraulics

Mr. Harris Vandergriff	Real Estate
Mr. David Reece	Environmental
Mr. David McNutt	Relocations and Cost Engineering
Mr. David Sirmans	Office of Counsel
Mr. Edward Belk	Planning, Programs, & Project Management

Little Rock District

Name	Technical Area
Mr. Joel Ward	Environmental
Mr. Roger C. Hicklin	Plan Formulation
Mr. Ken Carter	Environmental & Regulatory

TECHNICAL REVIEW MEETINGS AND CRITICAL CHECKPOINTS

The quality process recognizes that the appropriate place to perform one-on-one verification for both PPPMD and Engineering Division products will vary among the functional areas. However, the verifications will occur prior to the release of the data and/or final products to another office/division, but may include reviewers and project team members from other functional areas. The one-on-one verifications for both divisions will occur numerous times throughout the study. The one-on-one technical review verifications for both divisions are shown on the Open Plan diagram. Each one-on-one verification meeting will be documented and become part of the quality control records used in the quality assurance process by MVD.

In addition to the one-on-one verification process, there are also points within the study process where it is appropriate for the TRT and project team to perform the verification process as a team. This feature of quality control process allows the flexibility to optimize the one-on-one verification process within the functional area while maintaining the team concept during the Technical Review Meetings. Each will be documented and become part of the quality control records used in the quality assurance process by MVD. These points in the study process would typically occur consummate with six steps: 1) identify problems, needs, and opportunities, 2) inventory and forecast resources, 3) alternative plan formulation, 4) alternative plan evaluation, 5) compare alternative plans, and 6) identify selected plan.

QUALITY CONTROL/MAINTENANCE OF RECORDS

Quality control records for both PPPMD and Engineering Division products will be maintained in a technical review package prepared by the project manager and TRM. The package will consist of review comments and a certification checklist. The review comments will summarize the major issues/comments from the independent technical review along with the response or resolution to each comment. The technical review checklist will be included within the report as a means of documenting the independent technical review. Both the PPPMD and Engineering Division checklist will assure that the major elements of the quality control plan have been followed. PPPMD reviewers will sign the checklist, certifying that for their particular subject area, the document conforms to pertinent regulations, guidance, and sound professional

practices. Prior to the submittal of the draft report to HQUSACE the checklist will be completed by PPPMD functional chiefs, reviewed by Deputy for PPPMD, and signed by the District Commander as part of the required report documentation. Engineering Division's quality control records, comments and resolutions, will accompany the design document. The design checklist will serve as a tool for the TRT and will become part of the district's files.

CHECKLISTS

A checklist for review of Feasibility Reports is enclosed in this Quality Control Plan. It is meant to be a tool to assist the Review Team Member, not to replace his/her technical expertise or judgment.

CHECKLIST FOR REVIEW OF FEASIBILITY REPORTS

1. Has the study been conducted in accordance with and fully responsive to the study authority?

2. Is the study area, as defined, reasonable and consistent with the study authority?

3. Have the aerial extent and severity of the water-resources problems and without-project conditions been clearly documented?

4. Are current findings consistent with prior phases of study? Have intervening external factors (such as regulation changes, significant storm events, etc.) jeopardized previous logic, analyses and conclusions?

5. Have the assumptions and rationale for the without-project condition been explicitly stated and are they reasonable?

6. Are planning objectives clearly identified?

7. Were the views of non-Federal interests solicited and considered in the plan formulation process?

8. Have all reasonable structural and non-structural plans, including a no-action plan, been considered? Do they fully address the identified problems and needs?

9. Was the plan formulation analysis conducted in accordance with accepted techniques and appropriate guidelines and regulations?

10. Was the environmental work conducted in accordance with appropriate techniques, guidelines and regulations?

11. Was the economic/benefit analysis conducted in accordance with accepted techniques, guidelines and regulations?

12. Have all known benefits been included in the benefit estimate? Have high-priority benefits been identified?

13. Have economic methodologies and assumptions been explained in sufficient detail?

14. Is the evaluation of each alternative based on the difference between the without-project and with-project conditions?

15. Have risk and uncertainty been addressed in accordance with ER 1105-2-101?

16. Has the necessary coordination been conducted and documented in accordance with the National Environmental Policy Act of 1969 (NEPA) and ER 200-2-2?

17. Have HTRW considerations been addressed?

18. Is the proposed project recommendation consistent with current administration policies?

19. Does the over-all Planning report adequately display study assumptions, and findings, as well as and clearly represent a firm basis for the recommendation?

PLANNING REVIEW TEAM ASSIGNMENTS

Standing assignments for the most common planning products have already been in place within PPPMD with a plan formulation technical specialist and a regional economist already fulfilling this quality control function. The plan for independent review of environmental products is to have a senior environmentalist/archaeologist with significant Corps experience, but with little or no involvement in working on the specific study's day-to-day activities. Specific team member names will be provided at the inception of the study as Study Team and Review Team members are identified. Those other offices must provide review team assignments for technical support outside of PPPMD at the appropriate time.

Appendix I

Strategic Communications Plan

White River Basin Comprehensive Study

STRATEGIC COMMUNICATIONS PLAN

PURPOSE: The purpose of this Strategic Communications Plan is to develop a strategy for involving the public while developing the comprehensive study.

GOALS: To keep the general public informed. Ensure stakeholders are involved in the fact-finding process and gather information for the study.

OBJECTIVES:

1. Provide accurate information to the public.
2. Develop a process of open communication with all stakeholders.
3. Develop scope of studies that addresses concerns and meet the needs of the sponsors within time and cost limitations.
4. To identify valid concerns during the study process and insure consideration of reasonable alternative.

FORMATION OF INTERAGENCY PLANNING TEAM (IPT)–An interagency team was formed to review potential problems in the basin from their perspective. The IPT is made up of members from both the State of Arkansas and Missouri and other Federal Agencies. The project sponsors, Arkansas Game and Fish Commission, Arkansas Soil and Water Conservation Commission, and Missouri Department of Natural Resources are also members of the IPT. The IPT will provide valuable input as well as possible in-kind services to the study.

IDENTIFICATION OF COALITION PARTNERS/IPT MEMBERS:

Arkansas Game and Fish Commission
Arkansas Soil and Water Conservation Commission
Missouri Department of Natural Resources
U.S. Fish and Wildlife Service
U.S. Geological Survey
The Nature Conservancy
Arkansas Department of Natural Heritage
Arkansas Department of Parks and Tourism
U.S. Department of Energy, Southwest Power Administration
U.S. Environmental Protection Agency
Arkansas Waterways Commission
Arkansas Department of Environmental Quality
U.S. Department of Agriculture, Natural Resources Conservation Service
Missouri Department of Conservation

IDENTIFICATION OF PUBLIC/STAKEHOLDERS:

Flood control beneficiaries (cities, towns, communities along the river)
Water supply customers
Ag water supply interests
Farmers
Duck hunters
National environmental organizations
Local environmental organizations
Interested citizens
Environmentalists
Hunting and fishing related businesses
Power generation customers
Navigation
Lake recreation
Other recreation interest

FEDERALLY RECOGNIZED INDIAN TRIBES

Cherokee Nation (Oklahoma)
Osage Tribal Council
Tunica-Biloxi Indians of Louisiana
Quapaw Tribal Business Committee

STRATEGY:

The study will focus on identifying the water resource problems and opportunities. While possible solutions will be identified, all implementation studies and optimization will likely be conducted through subsequent efforts including continuing authorities, existing authority for other projects, or as specifically authorized studies resulting from the comprehensive study. No environmental assessment or environmental impact statement will be conducted as part of the comprehensive study, unless a particular component is carried through plan formulation and a selected plan is recommended.

The following are communication channels that will be utilized to reach our target audience:

1. **WEB PAGE** - Create a web page to update and provide current information to anyone interested in the developments of the study. The web site will allow the general public to be placed on an e-mail list for notification of updates or new developments. They can also submit comments or questions to the Corps.

2. **MAGAZINE ARTICLES** - Magazine articles will be developed occasionally when the study reveals information that may affect the general public or to inform a group or organization, such as Ducks Unlimited or the Arkansas Game and Fish

Commission. The Corps may participate in writing magazine articles to identify a project sponsor, and to place the basin-wide study in a positive light.

3. **PRESENTATIONS TO INTEREST GROUPS** - Presentations may be given to interest groups to further clarify the study when questions arise and provide additional opportunity for public input. In addition, cities and towns along the river will be contacted and Corps personnel will offer to meet with officials. The Corps will announce that we are willing to hold these presentations in our kickoff newsletter.

4. **NEWSLETTER** - An initial newsletter will be published to announce the study. The newsletter will outline the goals and objectives of the study and allow the public to provide comments early in the study process. Future newsletters may be published when necessary. Other newsletters could be in the form of a fact sheet designed to inform a specific group or organization that request further information.

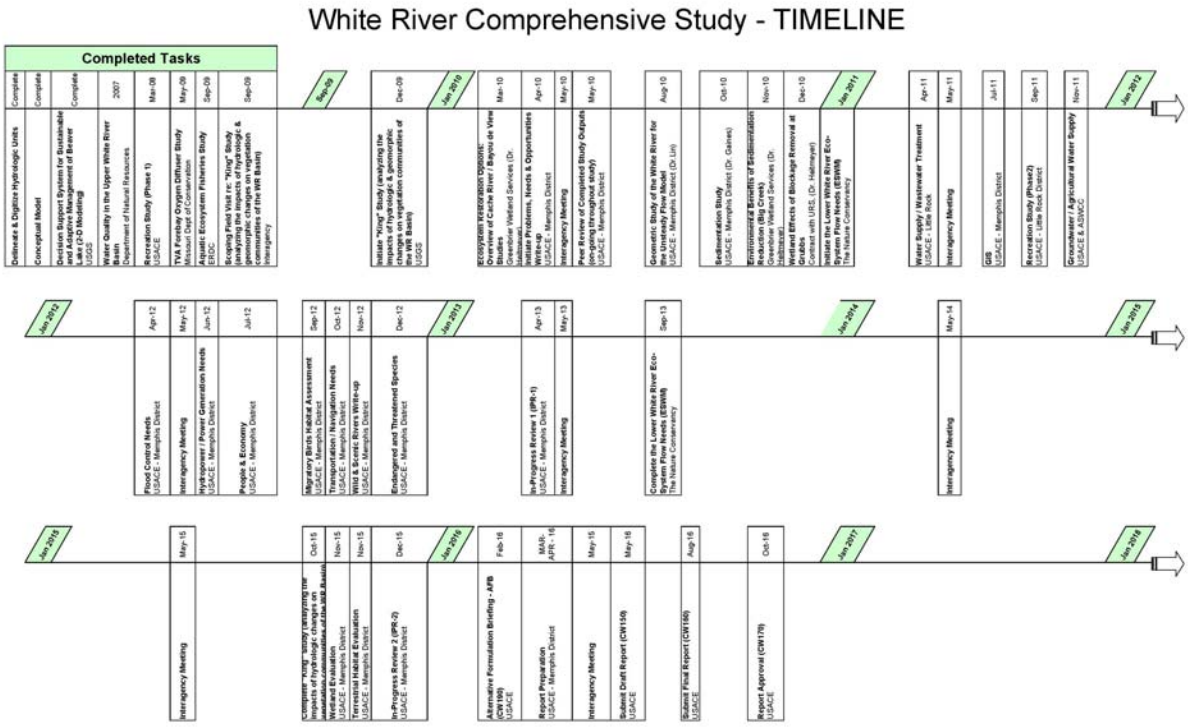
5. **NEWS RELEASES** - Formal news releases will utilize both SWL and MVM's Public Affairs Office(s) at the initiation of study, at selected study milestones, at completion of draft (or final) document.

6. **PUBLIC MEETINGS** – Formal public meetings will not be scheduled at this time. If situation dictates, public meetings will be scheduled as necessary.

The selection of a particular communications channel is based on the desired objective, the target audience, the cost, how it lends itself to the message being communicated, multiple exposures to messages, the mix of channels being used and the time it would take to implement.

FORMATION OF OVERSIGHT COMMITTEE – Formation of this group was suggested by some on the Grand Prairie Engineering Review Oversight Committee. The project sponsors may chose to form such a group.

APPENDIX 15
PROJECT TIMELINE


White River Comprehensive Study - TIMELINE
Completed Tasks
Complete
Complete
Complete
2007
Mar-09
May-09
Sep-09
Sep-09
Sep-09
Dec-09
Jan 2010
Mar-10
Apr-10
May-10
May-10
Aug-10
Oct-10
Nov-10
Dec-10
Jan 2011
Apr-11
May-11
Jul-11
Sep-11
Nov-11
Jan 2012
Defineate & Digitize Hydrologic Units
Conceptual Model
Decision Support System for Sustainable and Adaptive Management of Beaver Lake (2-D Modeling)
USGS
Water Quality in the Upper White River Basin
Department of Natural Resources
Recreation Study (Phase 1)
USACE
TVA Fernbay Oxygen Diffuser Study
Missouri Dept of Conservation
Aquatic Ecosystem Fisheries Study
BRBC
Scoping Field Visit re: "King" Study (analyzing the impacts of hydrologic & geomorphic changes on vegetation communities of the WR Basin)
Interagency
Initiate "King" Study (analyzing the impacts of hydrologic & geomorphic changes on vegetation communities of the WR Basin)
USGS
Ecosystem Restoration Options: Purchase of Cache River / Bayou de View Studies
Greenbrier Wetland Services (Dr. Hollinger)
Initiate Problems, Needs & Opportunities Write-up
USACE - Memphis District
Interagency Meeting
Peer Review of Completed Study Outputs (on-going throughout study)
USACE - Memphis District
Geometric Study of the White River for the Unsteady Flow Model
USACE - Memphis District (Dr Lin)
Sedimentation Study
USACE - Memphis District (Dr. Gaines)
Environmental Benefits of Sedimentation Reduction (Big Creek)
Greenbrier Wetland Services (Dr. Hollinger)
Wetland Effects of Blockage Removal at Grubbs
Coordinate with USIS. (Dr. Heimeyer)
Initiate the Lower White River Eco-System Flow Needs (EBWB)
The Nature Conservancy
Water Supply / Wastewater Treatment
USACE - Little Rock
Interagency Meeting
GIS
USACE - Memphis District
Recreation Study (Phase2)
USACE - Little Rock District
Groundwater / Agricultural Water Supply
USACE & AGWEC
Jan 2012
Jan 2013
Jan 2014
Jan 2015
Jan 2016
Jan 2017
Jan 2018
Flood Control Needs
USACE - Memphis District
Interagency Meeting
Hydropower / Power Generation Needs
USACE - Memphis District
People & Economy
USACE - Memphis District
Apr-12
May-12
Jun-12
Jul-12
Migratory Birds Habitat Assessment
USACE - Memphis District
Transportation / Navigation Needs
USACE - Memphis District
Wild & Scenic Rivers Write-up
USACE - Memphis District
Endangered and Threatened Species
USACE - Memphis District
Sep-12
Oct-12
Nov-12
Dec-12
In-Progress Review 1 (IPR-1)
USACE - Memphis District
Interagency Meeting
Apr-13
May-13
Complete the Lower White River Eco-System Flow Needs (EBWB)
The Nature Conservancy
Sep-13
Interagency Meeting
May-14
Interagency Meeting
May-15
Compare "King" study (analyzing the impacts of hydrologic changes on vegetation communities of the WR Basin
Wetland Evaluation
USACE - Memphis District
Terrestrial Habitat Evaluation
USACE - Memphis District
In-Progress Review 2 (IPR-2)
USACE - Memphis District
Oct-15
Nov-15
Nov-15
Dec-15
Alternative Formulation Briefing - AFB (CW190)
USACE
Report Preparation
USACE - Memphis District
Interagency Meeting
Submit Draft Report (CW150)
USACE
Feb-16
MAR-APR - 16
May-16
May-16
Submit Final Report (CW160)
USACE
Aug-16
Report Approval (CW170)
USACE
Oct-16