CASE STUDY: PLANNING OF THE UPPER LITTLE ARKANSAS RIVER WATERSHED DISTRICT NO. 95

By

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CHAPTER I

INTRODUCTION

General

The planning of small watersheds for water resources development in a predominately rural setting has been accomplished almost exclusively by the United States Soil Conservation Service since 1954 under the provisions of the Watershed Protection and Flood Prevention Program (Public Law 83-566). The Corps of Engineers, traditionally, has not pursued the planning of small rural watersheds. Furthermore, by Memorandum of Agreement effected in 1965 between the two agencies, the Corps formally agreed not to conduct planning in watersheds with drainage areas of less than 250 square miles where the flood damages are predominately rural in character. There are provisions in the Agreement where the Corps can, with the consent of the Soil Conservation Service, conduct planning in rural watersheds, however.

The PL 566 program of the United States Soil Conservation Service has been extremely popular in the State of Kansas. Requests for planning assistance from organized watershed districts has been so great that a large backlog of planning has resulted. Representatives of the Service have stated that under present personnel ceilings and funding limitations, it will be about 20 years before newly organized watershed districts could obtain planning assistance from them. The problem is

so acute that the Kansas State Department of Agriculture, Division of Water Resources, has set up a board for the purpose of setting planning priorities among the applicants.

The Tulsa District, Corps of Engineers has been investigating the water resources problems and needs of the Arkansas River and its tributaries between Great Bend, Kansas and Tulsa, Oklahoma under the authority of a study resolution from the United States House of Representatives. Screening studies of the Little Arkansas River watershed, a sub-basin of the Arkansas River, showed that small dams would be economical to construct, but large dams were not. Such development would normally fall under the preview of the U.S. Soil Conservation Service. The Service, however, recognizing their funding and personnel constraints, encouraged the Tulsa District to pursue planning studies in the watershed for the Upper Little Arkansas River Watershed District No. 95, a newly formed watershed district. They also encouraged the watershed district to seek planning assistance from Tulsa District, which they did. That watershed district has a drainage area of about 300 square miles.

The information and procedures presented in this thesis are from the experience of the author who is the study manager for the Arkansas River and Tributaries, Great Bend, Kansas to Tulsa, Oklahoma survey investigations, which is the umbrella study for the Upper Little Arkansas River Watershed District No. 95 investigations, for Tulsa District, Corps of Engineers.

Objectives

Corps of Engineers planners have had little or no experience in

watershed planning. In addition, few planners, Corps as well as others, are aware of the advantages and disadvantages of pursuing watershed development under the auspices of a survey report versus the provisions of Public Law 83-566. The objective of this thesis is to compare the advantages and disadvantages of accomplishing planning under the auspices of a survey report versus under the provision of Public Law 83-566 and to record the learning experiences encountered in watershed planning, the public participation techniques used by the author, and the technical difficulties which surfaced.

Justification of This Research

The potential for watershed planning in Kansas is great and the demands for watershed development are increasing. The results of this research will provide other watershed planners valuable information which will aid them in the pursuit of their investigations.

Organization of This Thesis

The organization of this thesis includes a discussion of the differences between project authorization by survey investigations and Public Law 83-566, a discussion concerning the planning process, a description of the study participants, a discussion concerning the forms used for public participation, and a discussion concerning the selection of planning objectives. The study conclusions and suggestions for further work are also included. The organization of this thesis provides the reader a background for distinguishing the differences between water resource development authorization by survey investigations and by Public Law 83-566. It also provides a step by step description of attaining participation in the planning process.

CHAPTER II

LITERATURE SURVEY

The Corps of Engineers has published many directives, manuals, and pamphlets concerning planning and public involvement in the planning process. These publications provide guidance for the planner to accomplish his planning in accordance with Corps policy. One of the most comprehensive publications is the Manual for Water Resources Planners. This manual is updated yearly. The material covered is appropriate not only for new planners who want to obtain a basic understanding of Civil Works policies and programs, but also for experienced planners who want to gain some knowledge of the new concepts and procedures used in the ever changing, complex planning activities.

The Corps of Engineers Engineering Regulation 1105-2-200 Series is the official Corps guidance for conducting feasibility studies for water and related land resources consistent with the planning requirements of the Water Resources Council's "Principles and Standards".

A number of studies have been made in the past few years on the subject of public participation in various planning activities. The United States Army Engineer Institute for Water Resources (a Corps of Engineers research facility), in October 1975, published a manual entitled Public Involvement in the Corps of Engineers Planning Process The purpose of that manual is to provide specific guidance and suggestions to Corps of Engineers field planning personnel in the design,

implementation and management of public involvement programs as integral parts of Corps planning processes.

In November 1971, Robert David Wolff authored a report entitled Involving the Public and the Hierarchy In Corps of Engineers' Survey Investigations. The report was originally prepared as a dissertation submitted to the Department of Civil Engineering and the Committee on the Graduate Division of Stanford University in partial fulfillment of the requirements for the degree of Doctor of Philosophy. The report provides a historical review of the legal basis for "Survey Investigation" and provides suggestions for improving Corps procedures for involving the public and the hierarchy in the planning process.

Many articles on water resources planning and public participation in the planning process have appeared in the American Water Resources Association's Water Resources Bulletin. The Bulletin is published bi-monthly and generally contains one or more articles concerning water resources planning and public participation in planning.

The United States Department of Agriculture (USDA) also publishes directives, manuals, and pamphlets concerning planning and public involvement in the planning process. The USDA Procedures for Planning Water and Related Land Resources, dated March 1974, states how USDA agencies will implement the conceptual basis for water resources planning embodied in the Water Resources Council's "Principles and Standards for Planning Water and Related Land Resources." The programs to which the procedures apply are the Watershed Program, Resource Conservation and Development Program, the eleven watersheds authorized by PL 78-534, and those river basin studies conducted cooperatively with the states and other federal agencies.

CHAPTER III

PROJECT AUTHORIZATION BY SURVEY INVESTIGATIONS AND PUBLIC LAW 83-566

The Corps of Engineers conduct project feasibility studies under survey investigation authority and the United States Soil Conservation Service conducts project feasibility studies under Public Law 83-566 authority. Both are processes which can lead to authorization for Federal participation in water resources development. There are major differences in the processes with regard to procedures for study and project authorization. There are also major differences in scope of study authority. It is essential that the planner understands the differences in the processes and the limitations of each.

A survey investigation can be initiated by citizens, local governments or their congressional representatives. The Corps of Engineers receives its authority to conduct survey investigations, however, from the Committee on Public Works of the Senate and the House of Representatives. The Corps cannot act on its own to make the investigations. The purpose of the survey investigation is to determine if there is a Federal interest, as established by law, in the solution of specific water resources problems. If there is such an interest the Corps is directed to report their findings and make recommendations to the committee which authorized the study regarding those plans and projects which are deemed to have engineering and economic feasibility and to be

environmentally and socially acceptable. Once the survey report has been accepted by the Committee, the Corps loses its authority to conduct further investigations. The Committee presents the recommendations to the Congress, generally in a Rivers and Harbors bill. If the Congress adopts the bill and the President signs it, the project becomes authorized, and the report recommendations become law.

Public Law 83-566, an Act, is a continuing authority for the Soil Conservation Service to conduct feasibility studies and to furnish financial and other assistance to local organizations. Investigations under the Act are initiated by application from a local organization. The Secretary of the Department of Agriculture has the authority to authorize planning assistance provided the application has been approved by the State agency having supervisory responsibility over programs provided by the Act or by the Governor. The Secretary of the Department of Agriculture authorizes assistance to local organizations in developing specifications, in preparing contracts for construction, and to participate in the installation of works of improvement resulting from the feasibility studies. The Secretary must transmit a copy of the plan of improvement and the justification to the Congress through the President prior to installation. Also, should the plan for works of improvement include any structure which provides more than twenty-five hundred acre-feet of total capacity, or cost more than $250,000, the plan must be approved by resolutions adopted by the Committee on Agriculture and Forestry of the Senate and the Committee on Agriculture of the House of Representatives, respectively.

The scope of investigation in a survey is limited only by the language of the authorizing Resolution and funds. Ordinarily the Corps

study resolution does not contain language authorizing the study of water conveyance nor on-farm drainage because these water resource problems are generally investigated by the Soil Conservation Service or the Bureau of Reclamation. The requirements for project construction are contained in the survey report recommendations, which generally conform to existing laws and policies concerning the Corps. Cost sharing requirements are varied according to project classification and purpose. For example, there is no cost sharing for lakes providing flood control where the beneficiaries are considered widespread. On the other hand, cost sharing is required for local flood protection projects.

The scope of investigations under the provisions of Public Law 83-566 are specifically defined. The Act, as amended, requires that the project be limited to a watershed area no larger than 250,000 acres and not including any structure which provides more than twenty-five thousand acre-feet of total capacity. Further, the Act requires that local interests shall (1) acquire without cost to the Federal Government such lands, easements, or rights-of-way as will be needed in connection with works of improvement installed with Federal assistance. These costs include removal, relocation, or replacement of bridges, roads, pipelines, buildings, fences or wells, (2) operate and maintain works of improvements on non-Federal land, (3) acquire water rights, (4) install land treatment measures on not less than fifty per centum of the lands situated in the drainage area above each retention reservoir to be installed with Federal assistance, and (5) assume a proportionate share of the cost to provide additional storage in structures for purposes other than flood control as may be determined by the Secretary. As a matter of policy, local interests are required to cost share 50-50 of

the storage costs allocated to agricultural water supply. Under the provisions of the Rural Development Act of 1972, local interests are also required to cost share 50-50 of the costs of storage for present municipal and industrial water supply needs. However, the Office of Management and Budget has not allowed the Department of Agriculture to implement that provision of the Act.

The survey report does provide more flexibility than PL 83-566 for the planner. There are no restrictions as to project size, drainage area controlled, and number of projects which can have recreation as a project purpose. Also, there is no requirement for local interests to install land treatment measures prior to project construction. On the other hand, the cost sharing advantage for local interests may be greater under the provisions of PL 83-566, as amended. For example, local interests are required to repay one hundred per cent of the costs allocated to municipal and industrial water supply under survey report authority, in accordance with the Water Supply Act of 1958 as against fifty per cent under PL 83-566 authority in accordance with the Rural Development Act of 1972.

Local interests are not required to contribute lands, easements, rights-of-way, or relocations for large dams authorized in a survey report nor are they required to operate and maintain it as they are required under PL 83-566. Should local interests be required to make those contributions and agree to operate and maintain for a system of small dams authorized in a survey report is an unresolved issue. There is a parallel in the Corps Section 205 of Public Law 80-858 flood control program which states that the contributions and the agreement to operate and maintain would be a project requirement.

CHAPTER IV

PLANNING PROCESS

The planning process involves the ordered bringing together of needs and desires as expressed by the people in such a manner that the most acceptable combination of needs and desires are fulfilled within the limits of the resources available. Plan formulation is not a step within itself but is an orderly and systematic process of making determinations and decisions in plan development evolution. It is a continuing process that is reiterated during the overall planning process to accomplish an increasing level of effect, detail, and refinement. The Corps' planning process is divided into three stages by specifying three points for monitoring study progress and scope. The three stages are: (1) the development of a plan of study, (2) the development of intermediate plans, and (3) the development of detailed plans. During each stage, four functional planning tasks are carried out: problem identification, formulation of alternatives, impact assessment, and evaluation. Each task receives different emphasis in each stage.

At this writing, planning of the Upper Little Arkansas River Watershed District No. 95 is in stage 2 of the Corps' planning process. A map of the watershed is presented in Figure 1.

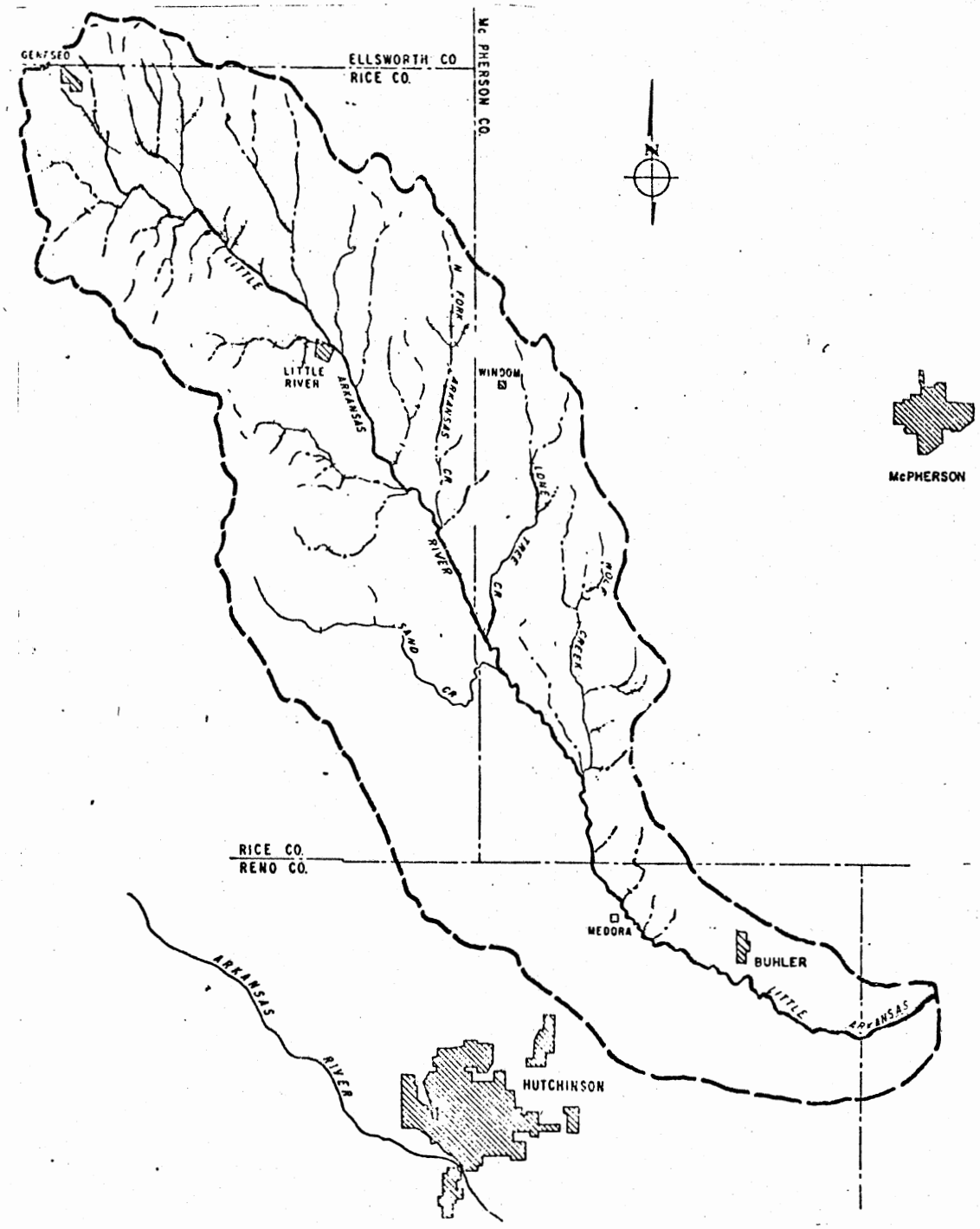

Figure 1. Upper Little Arkansas River Watershed

CHAPTER V

STUDY PARTICIPANTS

Engineering Regulations of the 1105-2-200 series of the Corps of Engineers which concern planning, state that

> The requirements of the Principles and Standards, the National Environmental Policy Act, and Section 122 of the 1970 Flood Control Act necessitate an interdisciplinary planning approach to identify and define planning objectives, develop creative alternative plans, and analyze a broad range of complex issues, including the likely economic, social, and environmental consequences of plan implementation.

That requirement is best accomplished by a planning team which employs a diversity of professional skills.

The regulations also state that

> To the extent appropriate, consultants, members of citizen groups, representatives of other government agencies, and other segments of the public should also be included as a part of the planning team to draw from a wider variety of sources and provide different perspectives on the study and its direction.

To comply with that regulation and to be in harmony with the theme of Chapter IV, an early and active program of public involvement and interagency coordination was initiated. The study participants included: the Corps planning team, the Upper Little Arkansas River Watershed District No. 95 (ULAR) Board, an Interagency Advisor Committee, district landowners, the public at large, and State and Federal Agencies. A description of these various study participants is described in the following paragraphs.

Corps of Engineers Planning Team

A Corps of Engineers planning team was assembled to participate in the public involvement program and to review study investigations. This team was composed of hydrologists, economists, sociologists, environmentalists, geologists, civil engineers, and fish and wildlife specialists. Investigations for most survey studies are made by a Corps study team. Because of a heavy workload in the Tulsa District, all study investigations were contracted to maintain study schedules. Two contractors were involved in the studies. The primary contractor, a large consulting firm, was responsible for the hydrologic studies, cost-benefit studies, impact assessments, and evaluations. That firm had its own interdisciplinary team. The second contractor was a small consulting firm which provided support studies for the primary contractor. The Corps study manager was responsible for coordinating and synthesizing the efforts of all involved.

Upper Little Arkansas River Watershed District No. 95 Board

The Upper Little Arkansas River Watershed District No. 95 (ULAR) Board has 15 members who are elected to their position by the District. They are elected to three year terms which are staggered to assure management stability. The Board members in office during the planning of the watershed were self-employed in farming or in livestock raising. Some were college graduates. The ULAR Board was a decision maker in the planning effort.

Interagency Advisory Committee

It was suggested, by the study manager, that the Board form an advisory committee consisting of representatives from the various State and Federal agencies who have an interest in water resources. It was also suggested that the Corps of Engineers representative be designated chairman of that Committee. Both suggestions were adopted and the Committee was formed. It consisted of a representative from the Corps of Engineers, the United States Bureau of Reclamation, United States Forest Service, Kansas Department of Agriculture Division of Water Resources, United States Soil Conservation Service, Kansas Forestry, Fish and Game Commission, United States Fish and Wildlife Service, Kansas Department of Environment and Health, United States Environmental Protection Agency, and the Kansas Water Resources Board. Several other State agencies who were contacted, declined to nominate a representative to the Committee, but requested that the Kansas Water Resources Board represent them. The Kansas Water Resources Board is the clearinghouse for the State of Kansas. If an issue had developed which would have concerned one of those agencies, the Kansas Water Resources Board representative would be responsible for coordinating with that agency to resolve the issue.

Initially, the Committee's function, as conceived by the study manager, was to provide the Board advice concerning impact assessments and evaluations of the alternatives formulated. Soon after the Committee was formed, the Corps of Engineers Engineering Regulation ER 1105-2-200 series, concerning planning, were revised. The revised regulations indicated a need for earlier involvement of interested

agencies in the planning process. The functions of the Committee were then broadened to assist in the forming of planning objectives and to assist in the forming of conceptual alternatives.

Landowners

Landowners who were not Board members but who would be affected by the structures considered in plan formulation, were contacted to obtain their views. Those landowners were made distinct from other landowners in the watershed who would not lose land to a project. It was recognized that their views would probably be different than other landowners and that their objection to site selection could affect project formulation.

Public at Large

The "Public at Large" group was designed to include those watershed district landowners not affected by a project, special interest groups, and interested citizens who were not connected with the District.

Interagency Coordination

The Corps of Engineers is required by law to coordinate their investigation with certain agencies. Those agencies have been notified and are participating in the studies.

CHAPTER VI

INVOLVING THE PARTICIPANTS

Communication Forms

There are many communication forms. Within the context of Corps planning, the list of potential public involvement techniques can be narrowed to five basic forms: small meetings, moderate-size meetings, large meetings, advisory group meetings, and citizen surveys. Small meetings are generally held with a single interest or organization. Normally their purpose is to surface issues and problems the interviewees want addressed and to obtain information the planner needs. In the ULAR studies they were used for an additional purpose. The middle-size meetings are generally for groups of people ranging from 10-50. They are used to encourage dialogue among the participants and are most valuable when issues and problems arise which pose potential conflicts among various interests. Large meetings provide a forum which is most suited for one-way communication. They typically involve large numbers of people and are most appropriate at each of the study stages. Advisory group meetings are for the interaction of a set group over a period of time. As the name implies, they are for advisory purposes and they usually make no binding decisions. Citizen surveys are made to elect specific factual information from affected publics. Such surveys can be conducted by face-to-face interview, by phone, by mail, or through

the news media. All five basic forms were used to effect public involvement in the ULAR studies.

ULAR Board

The ULAR Board was a decision maker in plan formulation. For the Board to make intelligent decisions and to effectively participate in the planning of their watershed, it was necessary to "educate" them as to the various planning constraints and the planning process and to "provide" them study information and data. This was accomplished by holding a series of small meetings which were classified as workshops. Nine workshops have been held to date.

The purpose of the first workshop was to educate the Board as to the various planning constraints, the major steps in accomplishing plan formulation, and possible planning goals. Also, that workshop included suggestions for the Board on how they could conduct their own information transfer (public involvement) program. The objective of the second meeting was to provide the Board specific information about the criteria for defining the National Economic Development Plan and the Environmental Quality Plan, which is a requirement of the Water Resources Council's "Principles and Standards"; provide information relative to the most significant aspects of the natural and man-made environment of the watershed; and the need for considering aquatic and terrestrial wildlife habitat in watershed planning. The third meeting was designed to provide some concepts about hydrology and hydraulics so that the Board could conceptualize the impacts structural development would have on flood flows and stages; to acquaint the Board with the relationship of dependable water supply yield from a lake to drainage area controlled;

to acquaint the Board with the geology of the watershed and some significant dam design considerations; and to explain the topographic, geologic, and soil considerations in dam site selection.

The first three workshops were educational. At the fourth workshop, the findings of the watershed flood damage surveys and dam site investigations were presented. The findings were presented so that the Board could readily forecast which dams would have the greatest potential for economical development. The fifth workshop was devoted to the screening of the 85 dam sites investigated to form an initial flood control plan for evaluation.

While the dam sites selected by the Board were being evaluated, a sixth workshop was held. At that workshop, a presentation was made concerning socio-economic considerations in plan formulation and the cost-sharing requirements in water resources development (under Corps policy). The seventh workshop was an information meeting. The economic evaluation of the dam sites selected by the Board in workshop five was presented and the lake development potentials for flood control in the watershed were discussed. Also discussed were the potentials for water supply and recreation development. At the conclusion of that workshop, a dialogue was established between the Board and the Corps study manager concerning the formulation of additional alternatives for impact assessment and evaluation. The Board expressed their preferences on the combination of measures and scope of multipurpose developments which they wanted to be formulated into alternatives and evaluated. Following that workshop, the study manager developed ten alternatives and presented them to the Board at the eighth workshop for their concurrence before proceeding with the impact assessments and evaluations. Those

alternatives are shown in Figures 2 through 11. Three of the ten alternatives have since been screened from study because their costs exceeded their benefits. There are many impact assessments to make in plan formulation. One is the impact on the fish and wildlife resources. The ninth (last to date) workshop was devoted to reviewing the impacts each alternative would have on those resources.

All but one workshop were held on the regular meeting night of the Board, which is the second Monday of each month. The workshops were conducted after the Board completed its regular business, which generally required about one hour. Each workshop generally lasted about two hours which resulted in an overall meeting time of three hours. The meetings were started at 7:30 p.m. and generally adjourned at 10:30 p.m. In retrospect, the author believes that too much information was presented at each "education" workshop and that the workshops were concluded at too late an hour. Too much unfamiliar information received at one time is mind dazzling and presenting unfamiliar material at a late hour at night is not conducive for full audience attention.

An outline was made of all workshop information to be presented and was shown on a flip chart for reference. Supporting data, maps, and sketches for the presentations were shown on a second flip chart for reference. Flip charts are an effective technique for communication with small audiences, such as the ULAR Board, so long as the material covered is not extensive. A copy of the workshop material (or outline), data, maps, and sketches was presented to each Board member for reference before each workshop. An example flip chart is shown in Table I.

Most presentations were made by the study manager (author) but,

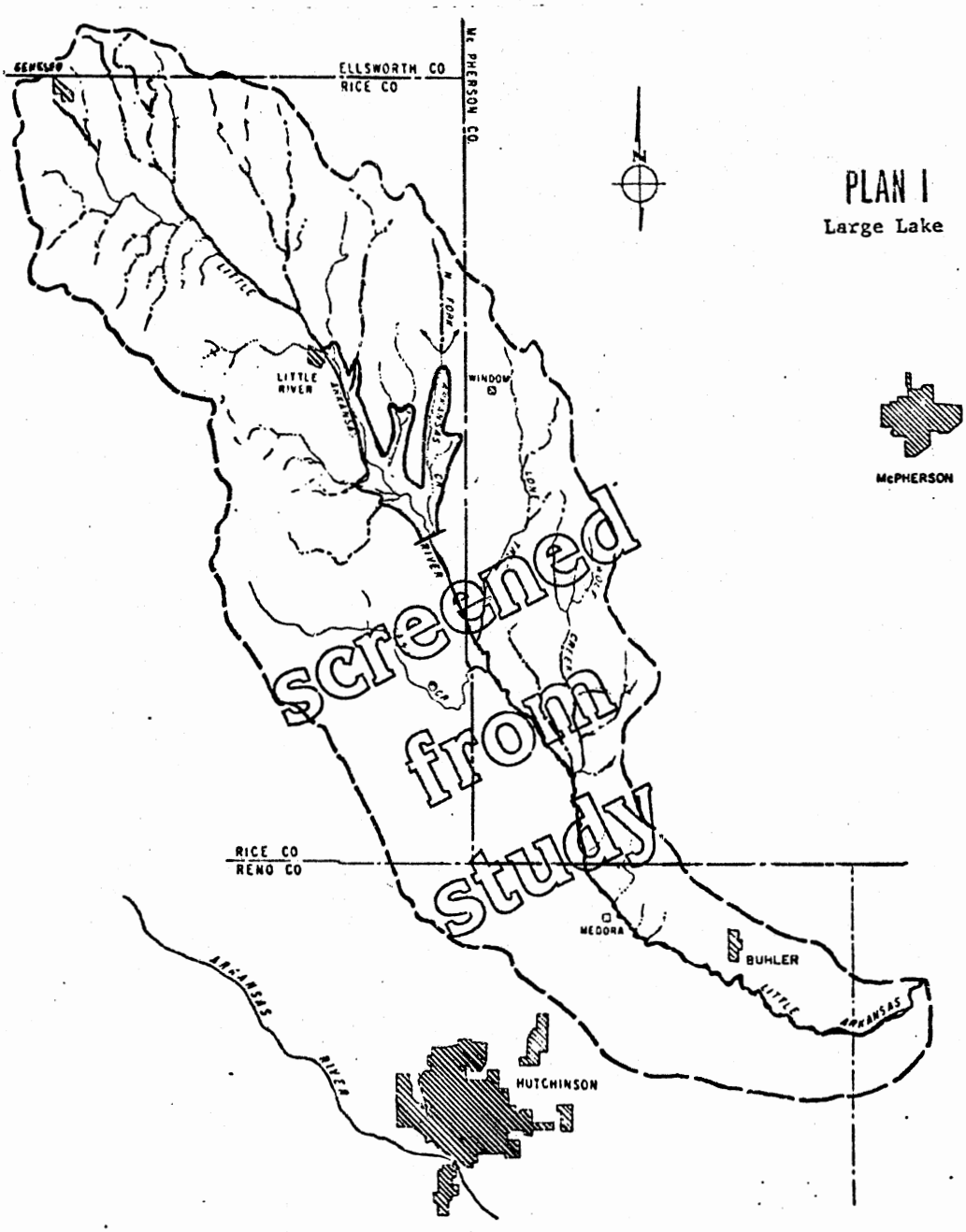

Figure 2. Upper Little Arkansas River Watershed, Plan I

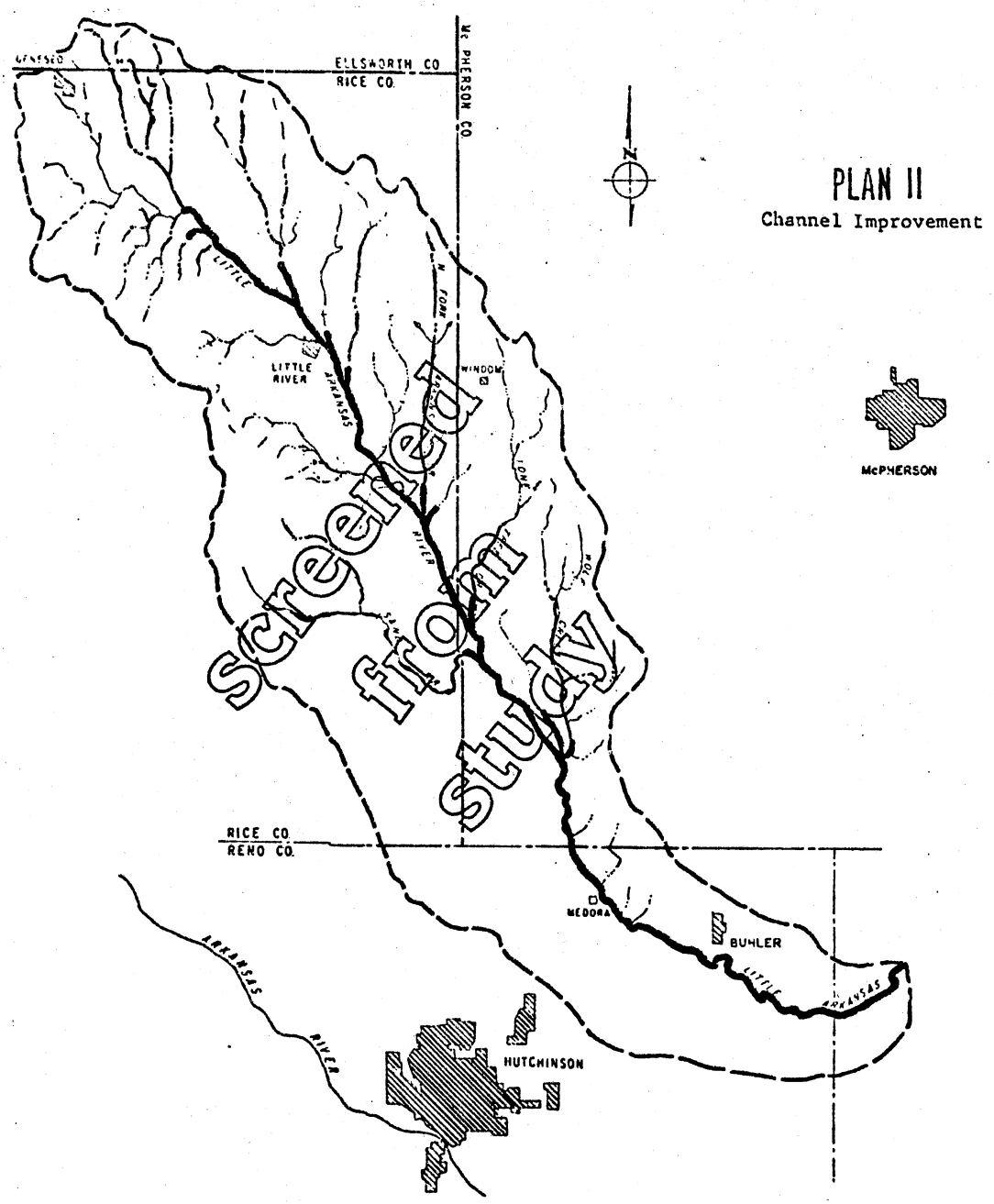

Figure 3. Upper Little Arkansas River Watershed, Plan II

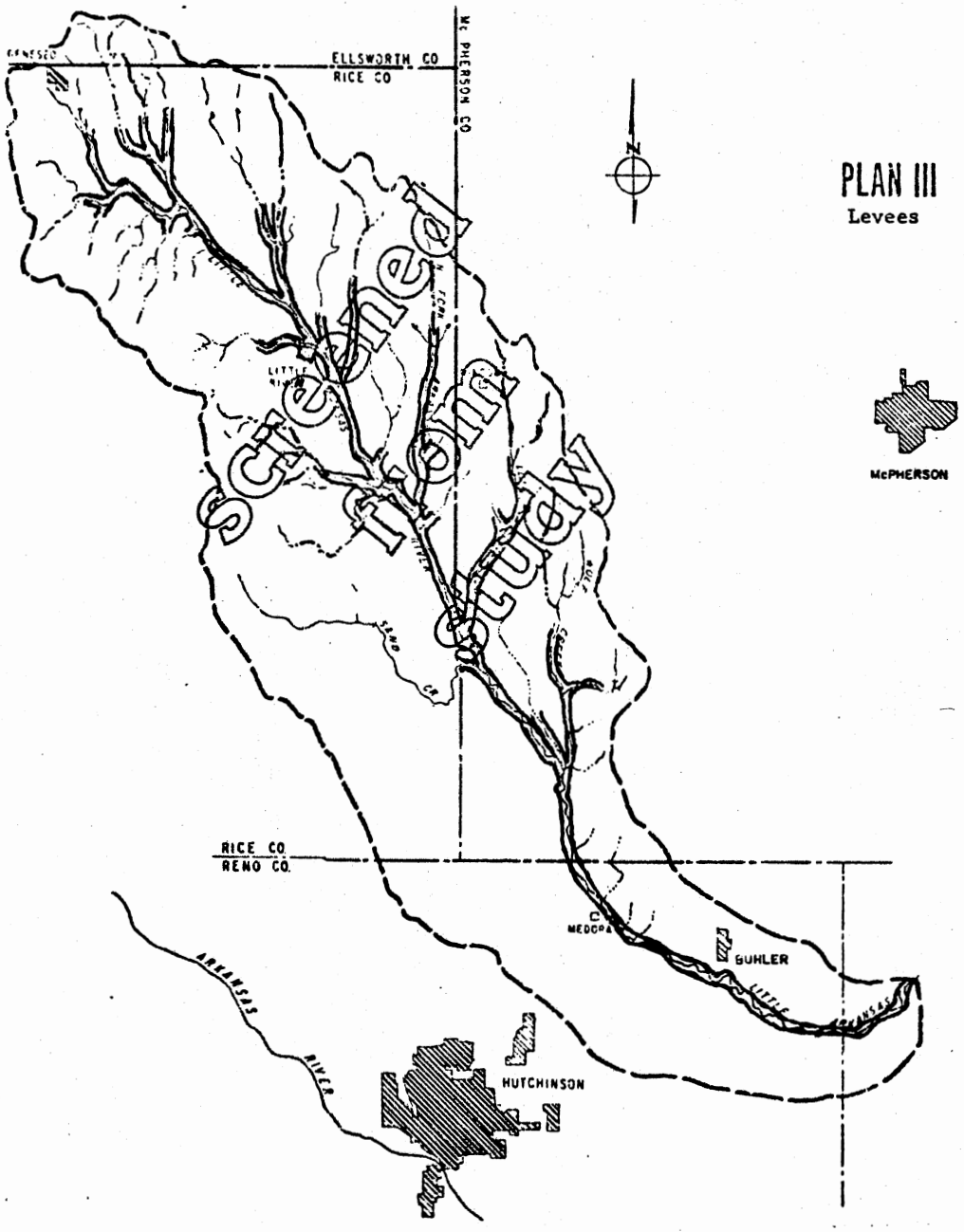

Figure 4. Upper Little Arkansas River Watershed, Plan III

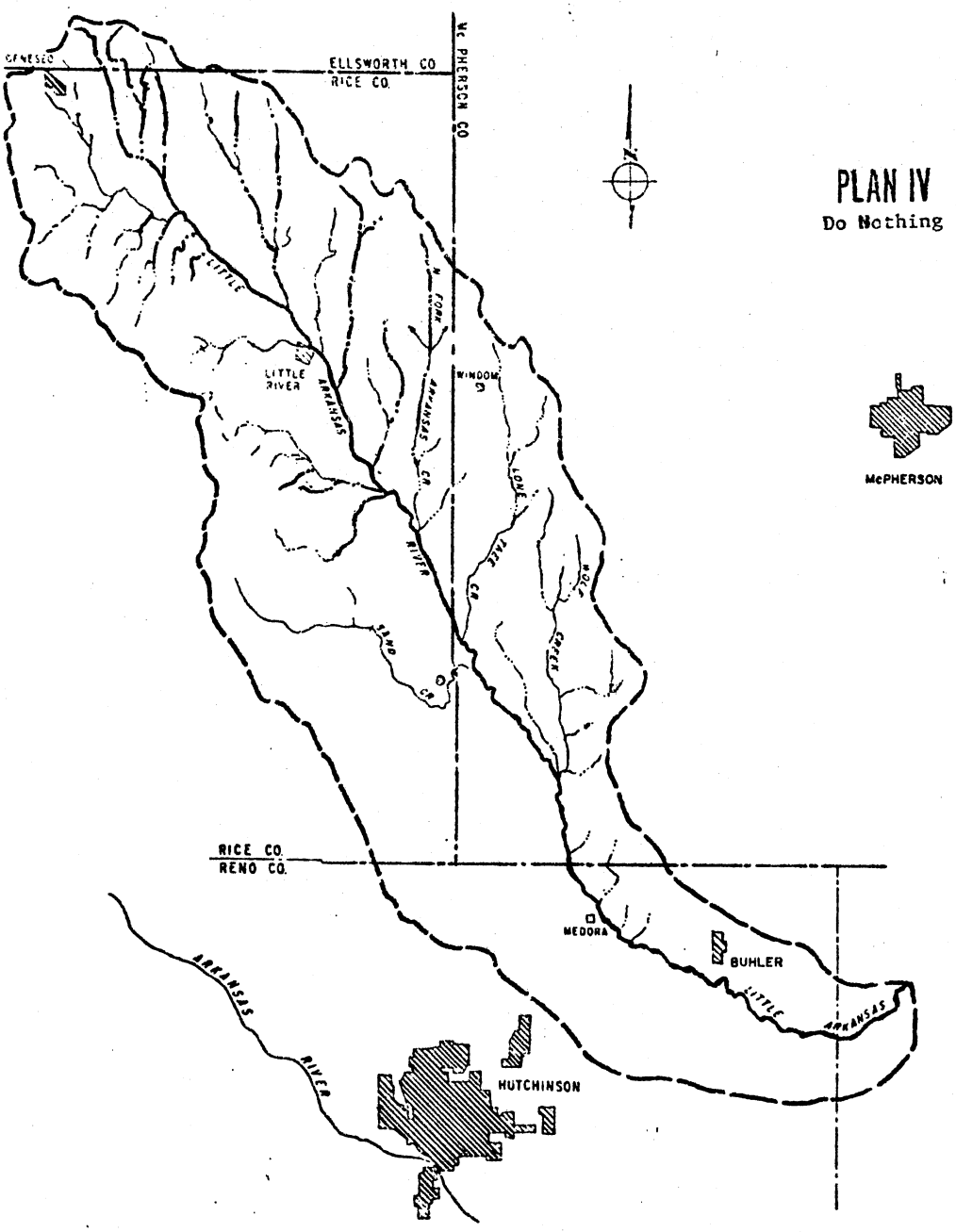

Figure 5. Upper Little Arkansas River Watershed, Plan IV

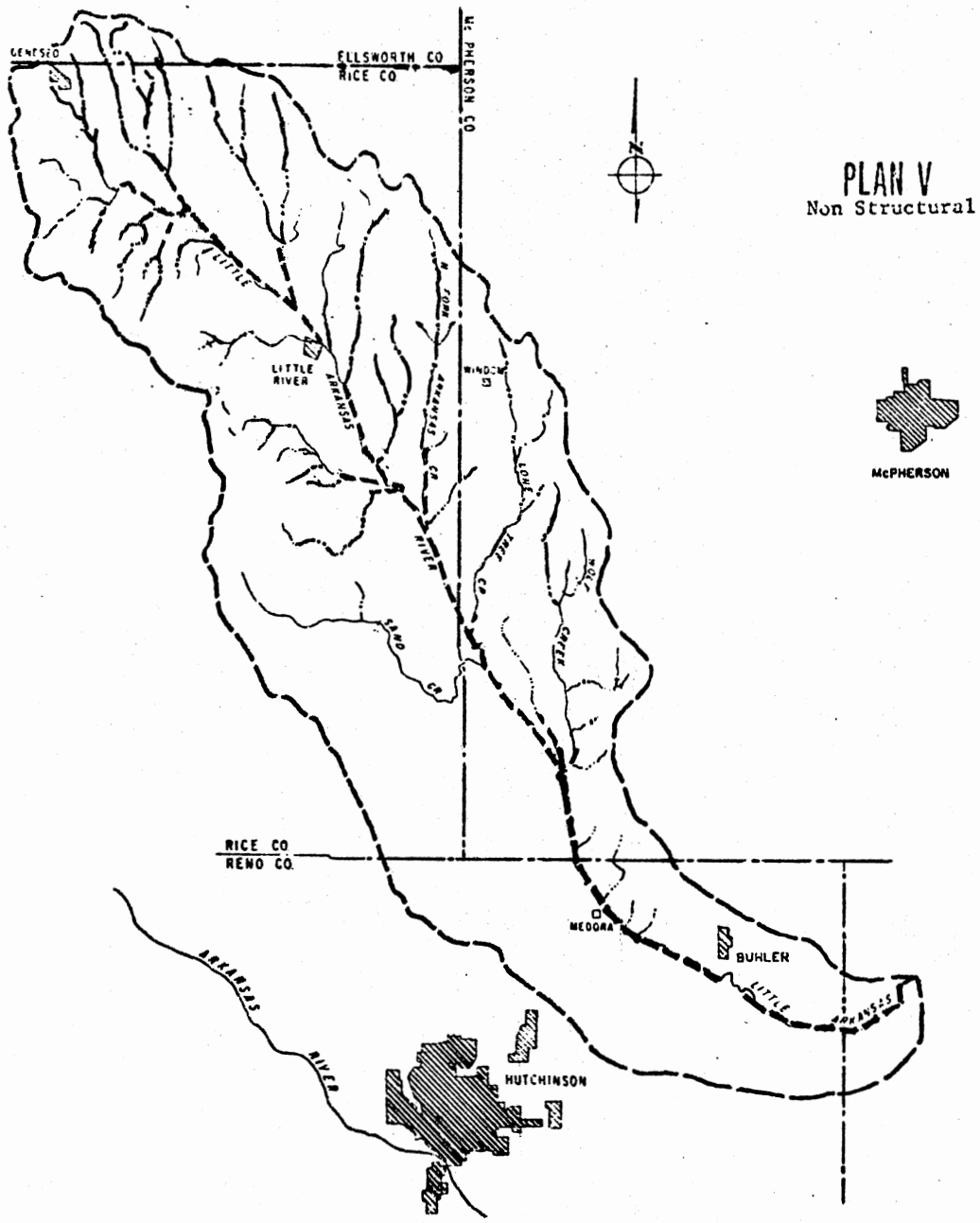

Figure 6. Upper Little Arkansas River Watershed, Plan V

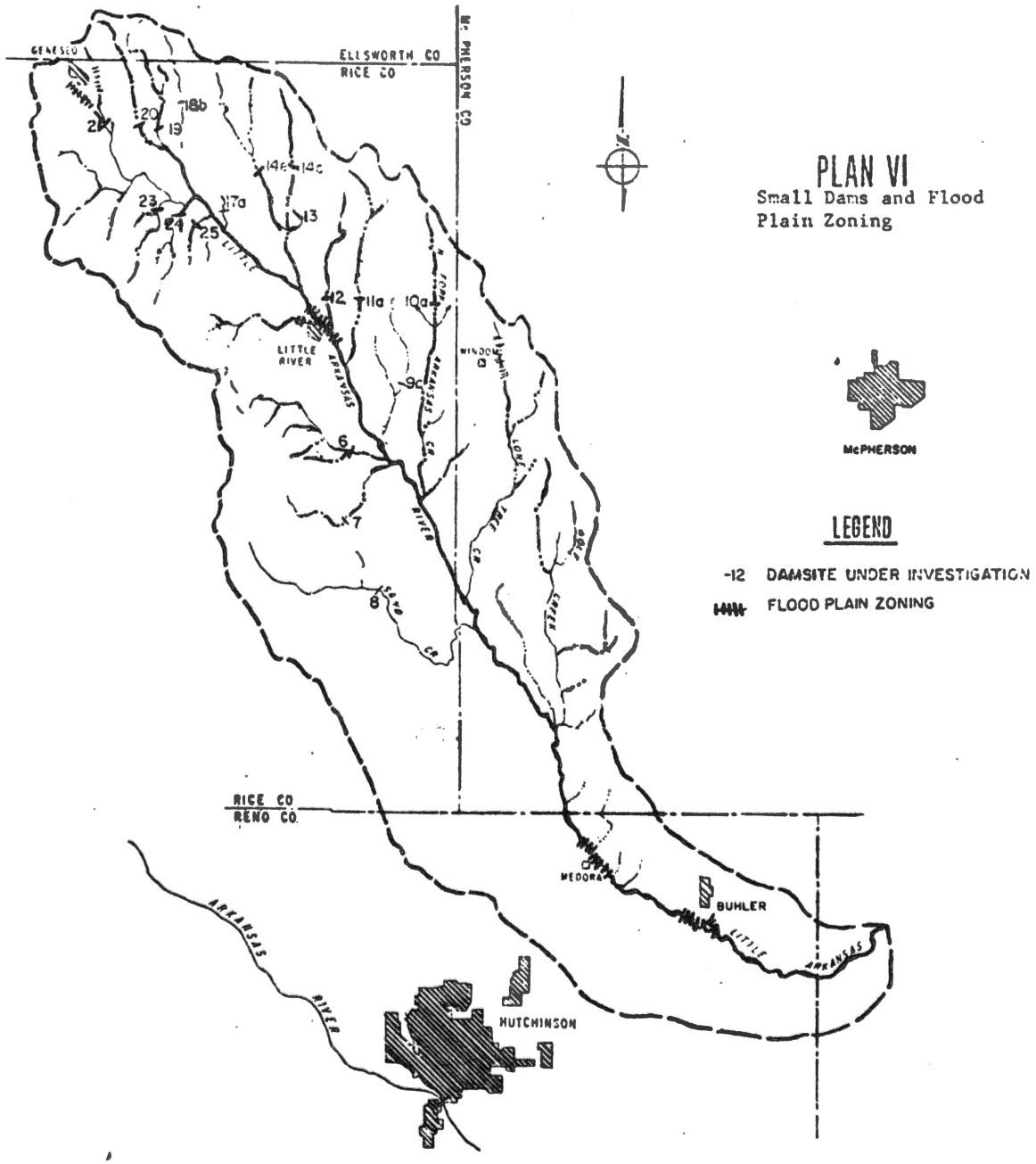

Figure 7. Upper Little Arkansas River Watershed, Plan VI

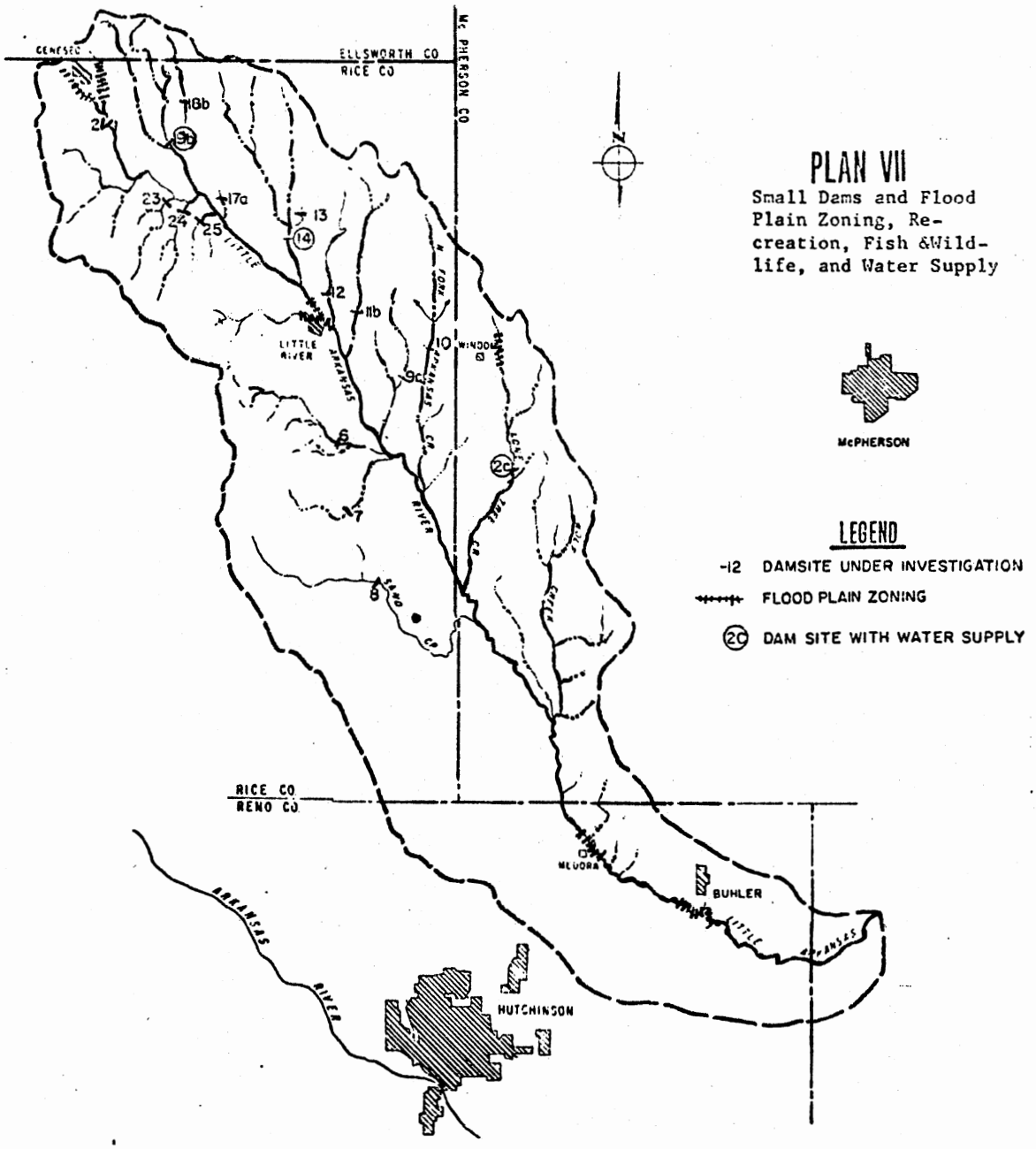

Figure 8. Upper Little Arkansas River Watershed, Plan VII

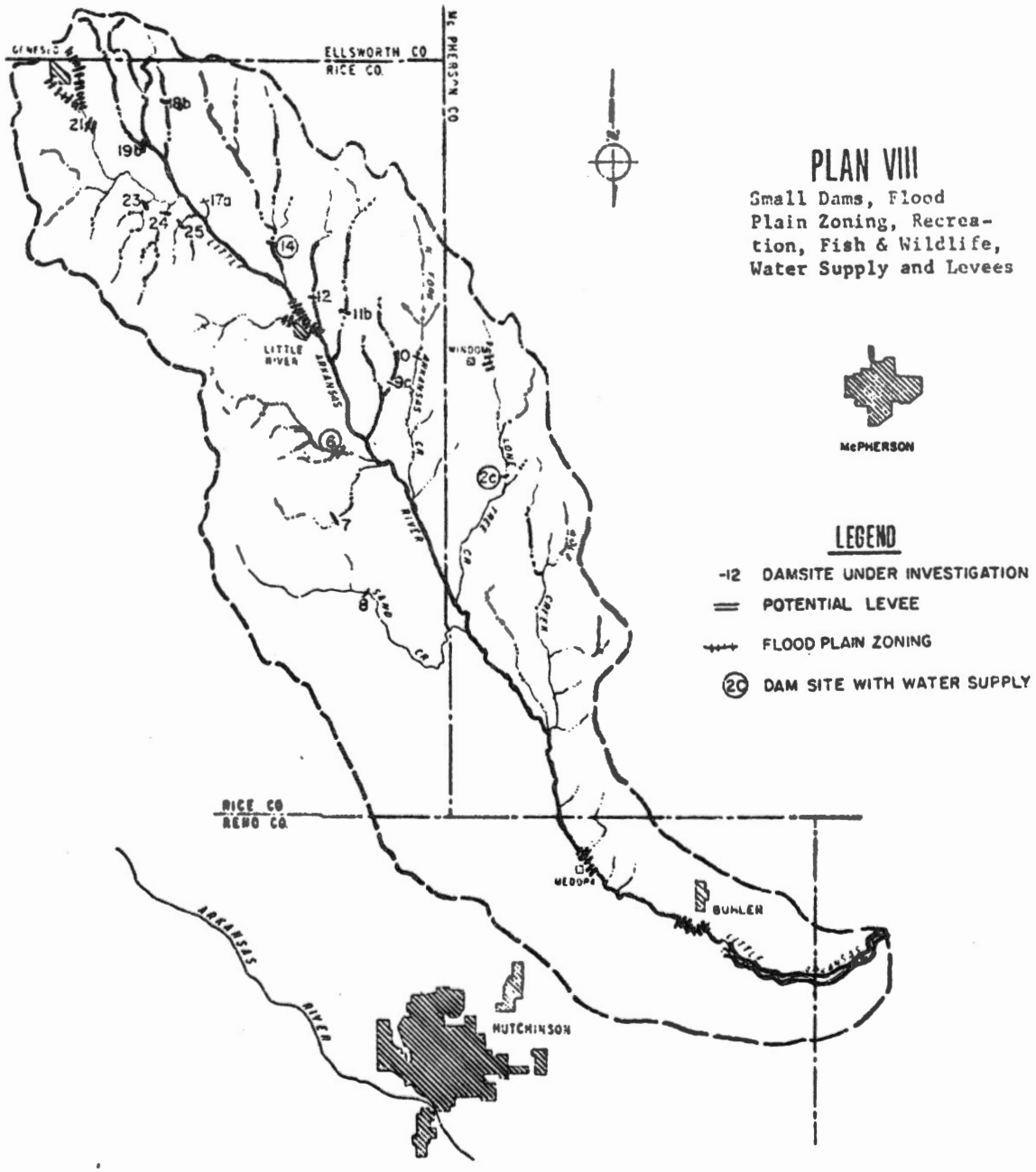

Figure 9. Upper Little Arkansas River Watershed, Plan VIII

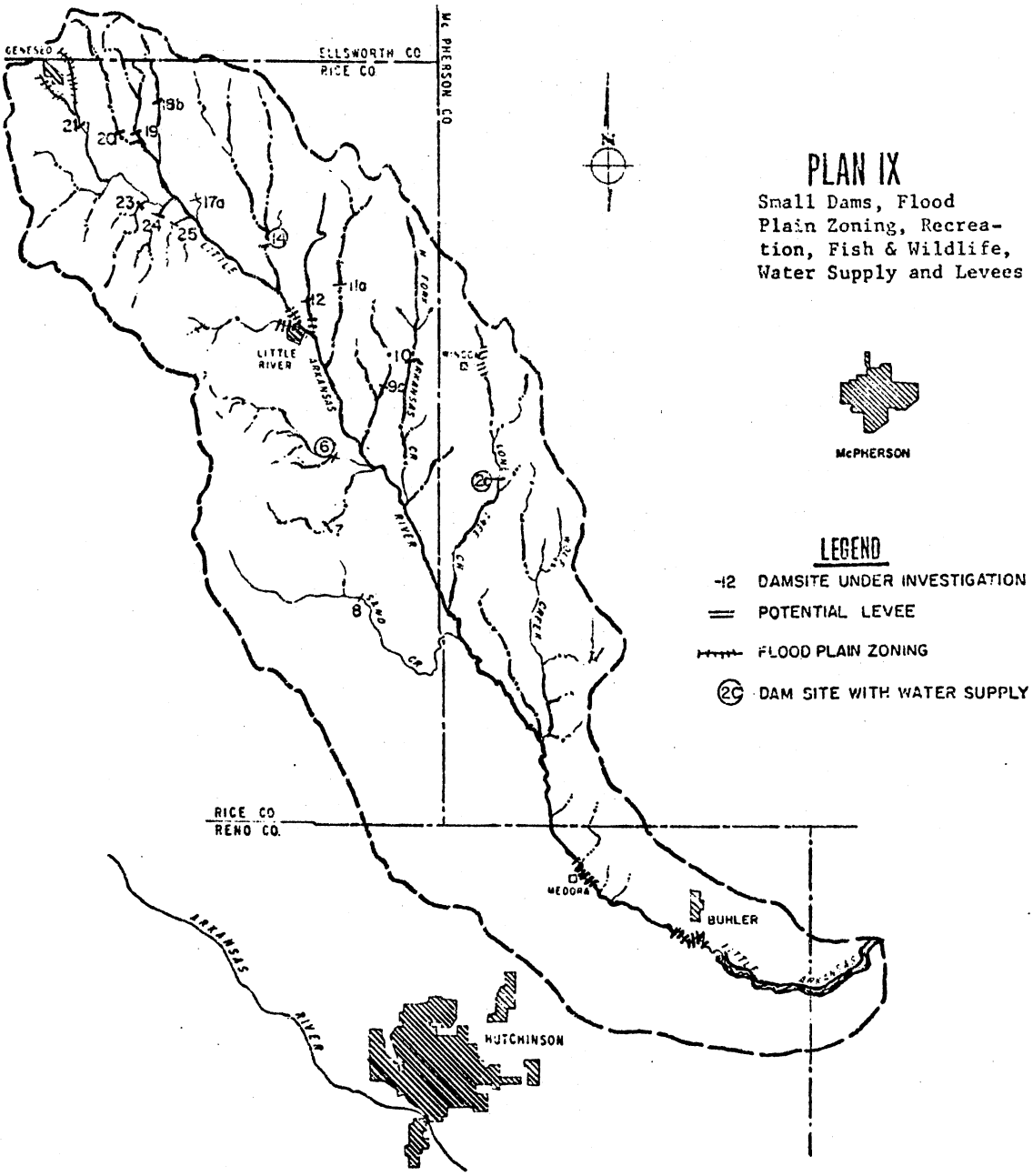

Figure 10. Upper Little Arkansas River Watershed, Plan IX

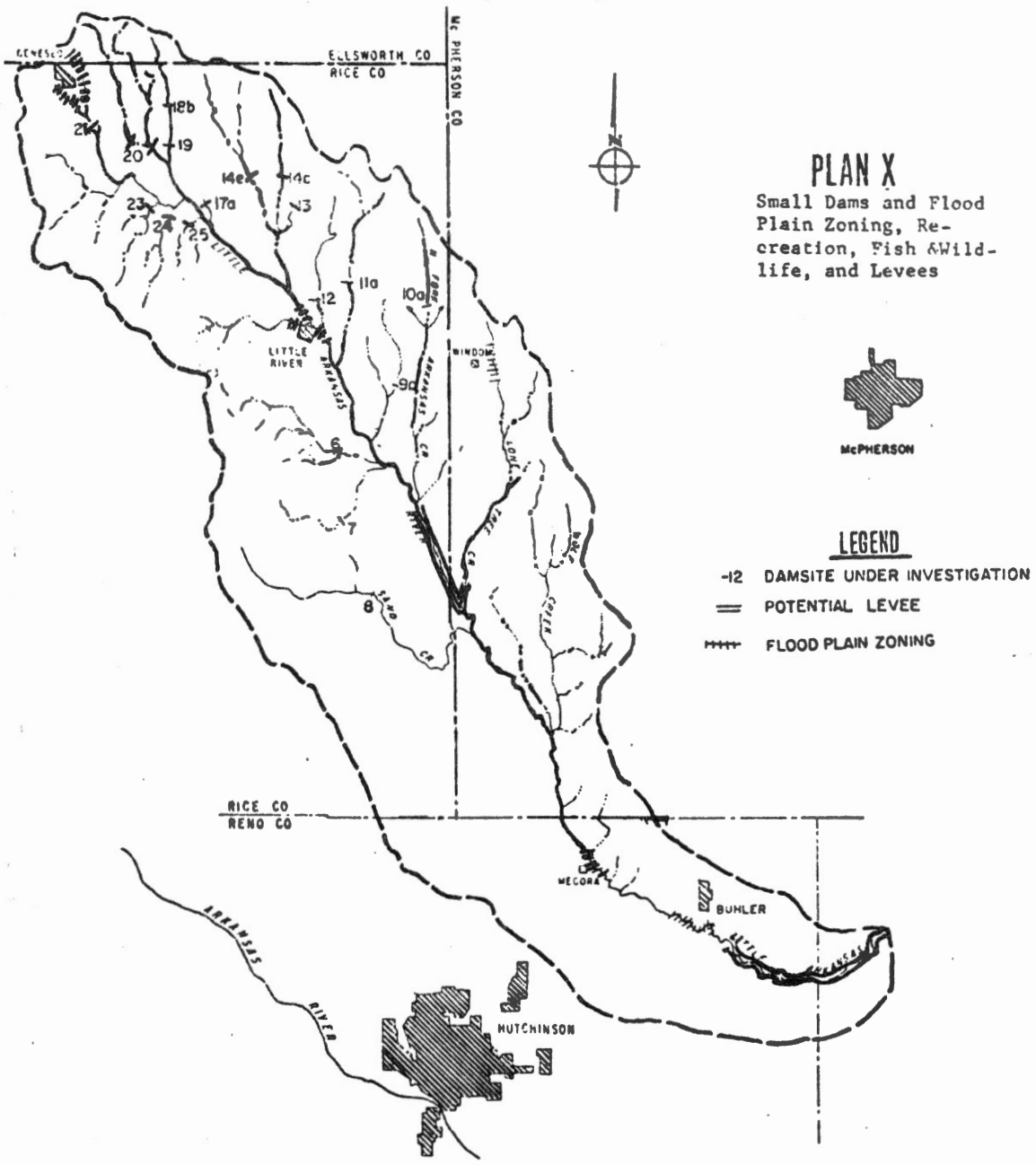

Figure 11. Upper Little Arkansas River Watershed, Plan X

TABLE I

PLANNING CONSTRAINTS

1. Laws, Executive Orders, and Regulations
   a. Benefit-Cost
   b. Environment
   c. Cost-Sharing
2. Physical
   a. Geography
   b. Relocations
   c. Availability of Materials
3. Natural Environment
   a. Climate
   b. Rainfall - Runoff Characteristics
   c. Geology
4. Social

some were made by specialists from the Corps or from other agencies. For example, those presentations which concerned fish and wildlife, hydrology and hydraulics, economics, geology, sociology, or the environment were made by specialists in those disciplines. The study manager could have made the presentations, but believed the credibility of the presentation would be greater if made by a specialist One or more representatives of the United States Soil Conservation Service was present at each workshop. Their presence was of great value for they provided the necessary expertise to compliment the workshop discussion.

Advisory Committee

The Advisory Committee is an advisor to the Board and they make no binding decisions. Only one meeting has been held to date with the Committee. The purpose of that meeting was to propose some planning objectives and to select some alternative measures to meet the proposed planning objectives.

The meeting had two parts. The first part was designed to acquaint the Committee with the study area, to advise them of Corps policy concerning plan formulation, and to inform them of the results of studies concerning the problems and needs of the area. The second part was designed so that the Committee could participate in selecting planning objectives and possible alternative measures for satisfying the objectives to the Board.

Acquainting the Committee with the study area was accomplished (1) by a presentation covering all significant natural and man-made resources known from study, and (2) by a helicopter fly-over. The presentation was made by a Corps environmental specialist. A flip

chart, with an outline of the subject material, was used to aid the presentation. In addition, all committee members were furnished a hand-out containing that presentation. Flip charts were also used to cover Corps planning policy and the problem and needs presentations. Hand-outs covering those subjects were also furnished the Committee. Those subjects were covered by a Corps policy expert and the study manager.

The first part of Advisory Committee meeting was of one-way communication. In the second part, two-way communication was established. A "laundry" list of possible planning goals and possible alternative measures was handed each member. The Committee was divided into work groups of four each. By application of the Delphi technique, each group screened their lists and made selections. The selections were compiled for presentation to the Board.

Landowners

Two methods for involving landowners in the study were used. An informal meeting with about 30 landowners was held to apprise them of the alternative plans which were to be investigated. Each was furnished a map of the alternative plans. No details of the proposed structures were presented at that meeting because it was believed that each would want to express their views. The study manager believed that their views could best be obtained by a Citizen Survey conducted by the Board. A Citizen Survey is now underway.

Public at Large

The plan for communicating with the "public at large" group consists of informing them of the study progress by news releases and by

the holding of public meetings. Several news releases, which have been made by the Board, have not resulted in any inquiries. There has not been a study public meeting, but the Board has held their annual watershed meeting. At the annual meeting all landowners were briefed as to the study status and maps of the alternatives were presented. Some amateur archeologists from Hutchinson were shown the maps by one of the meeting attendees. They became interested in the study and attended a Board meeting to express their concern over possible structural involvement with the area's archeology.

Agency Coordination

Study input from the various agencies which the Corps is required to coordinate with is being accomplished by mail.

Summary

Several communication forms have been used to obtain inputs from the various publics which have been identified to accomplish plan formulation. Many issues, concerns, and potential solutions for them have been identified by the public involvement program of ULAR. The public involvement, while necessary, is not sufficient to assure a successful outcome from the planning process. The study manager is responsible for exercising the necessary professional judgment and analysis to insure that all issues, concerns, needs, opportunities, desires, and constraints relevant to the study effort are identified.

CHAPTER VII

PLANNING OBJECTIVES

The ULAR Watershed District No. 95, recognizing certain water resources problems and needs, formulated the following organization policy statement:

> The purpose of this organization shall be to combat the serious problems of water management resulting from erosion, flood water, sediment damage, or instability of natural water supplies and for the further purpose of alleviating such damages and furthering conservation, development, utilization and disposal of water, thereby preserving and protecting the area's land and water resources.

Those were the problems and needs which the Watershed District perceived but could not quantify. Also, those were the problems and needs which were considered by the Advisory Committee in their screening of Planning Objectives.

The Advisory Committee reviewed all available reports concerning water resources problems and needs in the vicinity of the Watershed District. Those reports included: the Corps problems and needs study of the Arkansas River and Tributaries, Great Bend, Kansas to Tulsa, Oklahoma; the Kansas Water Resources Board studies of the Little Arkansas River Basin; the United States Bureau of Reclamation's Kansas State Water Plan studies; and the United States Soil Conversation Services' Kansas Basin Plan studies. The Committee noted that the Corps, the Bureau's, and the Services' studies presented their water supply needs by counties which encompassed too large of an area to

ascertain the needs of the ULAR watershed. Even the Kansas Water Resources Board's study area was too great to identify the municipal, industrial, rural domestic, and livestock water supply needs. The water supply needs for ULAR were disaggregated from those studies, but it was recognized that projections for small areas, such as ULAR, could not be used with the same confidence level as those for areas of greater geographic aggregation.

The Committee, after reviewing the available data, recommended that the Board adopt flood control, sediment control, erosion control, recreaction, livestock water supply, rural domestic water supply, and fish and wildlife as planning objectives. Irrigation water supply was not recommended because Bureau studies indicated that net returns from irrigation were too low to justify the investment. Water supplies for municipal and industrial purposes were not recommended because all of the communities in the watershed were small and projections indicated little increase in future needs. There is a known water quality problem on Sand Creek, but the Committee noted that studies by the State of Kansas indicated the problem was diminishing and that corrective measures to accelerate the natural leaching would be beyond the scope of watershed development. Therefore, water quality was also not recommended.

The Committee was not convinced that water supply should be a planning objective. Their concern centered on the questionable accuracy of predictions of the small area. However, there was no evidence that there would not be an increase in future water supply demand.

The planning objective recommendations of the Advisory Committee were presented and adopted by the Board.

CHAPTER VIII

CONCLUSIONS

It is essential that the planner understands the differences in the processes and the limitations of project authorization by survey investigations and by Public Law 83-566. The survey investigation provides greater flexibility for the planner in most instances. On the other hand, local interests could be disadvantaged by a survey investigation if their primary objective is water supply.

The public participation program designed for the ULAR watershed is working and the goal to obtain an interdisciplinary approach to planning is being achieved.

It is important to select realistic planning objectives early in the study. The forming of an Advisory Committee consisting of representatives from various State and Federal agencies and the obtaining of local interests' views will help assure a realistic selection of planning objectives.

CHAPTER IX

SUGGESTIONS FOR FUTURE WORK

Based on the results of this investigation, the following suggestions are made for future research.

1. A study should be made to ascertain the validity of assuming flood control benefits accruing to a system of small dams in a rural setting are local and not widespread.

2. A study should be made to determine a reliable method for making water supply projections for small areas.

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