Statement of Work

WATER ACTIVITY NAME –Stakeholder's Cooperative Management Analysis for the Upper Arkansas River Basin

GRANT RECIPIENT – Southeastern Colorado Water Conservancy District

FUNDING SOURCE – Arkansas River Basin Account - $33,600

INTRODUCTION AND BACKGROUND

The basis of this study originated as a result of a stakeholder meeting held by the Southeastern Colorado Water Conservancy District in March 2009. The purpose of the meeting was to discuss effects of seasonal water flows in the upper Arkansas River basin in years 2002-2008, and discuss potential alternatives to future flow management practices. The stakeholders agreed that water "movement" in the upper Arkansas was complex, and was not fully understood by the participants at the meeting. It was concluded that a "stakeholder" analysis should be developed to allow participants to predict the effects of proposed water activities, and that stakeholders needed to carry out a "risk management" analysis for such activities.

This study proposal is a direct outcome of this 2009 meeting. The objective of the study is to assess historical practices and evaluate new alternatives to reduce negative stakeholder impacts while, concurrently, increasing efficiency and benefits. As a result, study results are expected to: 1) encourage the identification of new partnerships; 2) promote better communication among participants, 3) broaden the understanding of the restrictions and operational limitations involved in upper river management, and; 4) provide more precise management guidelines for the Bureau of Reclamation and other water providers and users.

The Stakeholder's Cooperative Management Analysis is a stakeholder supported investigation of past and current river operations in the upper the Arkansas River basin. This analysis will identify historic management strategies used during high, average, and low river flow years and assess the impacts of those strategies. Then, based on stakeholder inputs, a limited number of new management strategies to enhance impacts on fishery, recreational, agricultural and landowner components will be developed and assessed. New management alternatives, based on analysis outcomes, are likely to be dependent on collaborative and cooperative strategies involving specific stakeholders not previously identified as potential partners.

The study will focus on water supplies in the upper Arkansas River basin, especially as it relates to the operations involving transmountain diversions, municipal upstream exchanges from Pueblo Reservoir and Fountain Creek, releases from Turquoise and Twin Lakes Reservoirs, and storage levels in Pueblo Reservoir. Input from the stakeholders will be analyzed in the context of a river operations analysis that identifies the legal and institutional framework in which all management alternatives must be considered. Results of the analysis outputs will not only produce cooperative management alternatives that can achieve the highest level of stakeholder satisfaction, but it will also identify management and operational constraints in implementing specific alternatives.

This study will utilize the stakeholder's list and the Roundtable's executive committee developed for the recently initiated Arkansas River Decision Support System Feasibility Study (ARKDSS). In addition, individuals representing specific "technical" users (municipalities, State Engineer's Office, water districts, Bureau of Reclamation) and "socio-economic" users (recreational and environmental interests, and local and county officials) will be consulted regarding analysis outputs and study results.

The alternatives will be reviewed by the various stakeholders and final management alternatives will be ranked and categorized into a final report to the Arkansas River Roundtable.

OBJECTIVES

List the objectives of the project:

1. Identify and assess (at a reconnaissance level) specific stakeholder-supported management alternatives for Arkansas River operations related to high, average, and low flow regimes.
2. Create a better understanding of the rationale and need for upper Arkansas River management among stakeholders.
3. Promote cooperation and collaboration of the stakeholders to more effectively and efficiently address the multiple needs and interests.
4. Provide and add data to the Roundtables consumptive and non-consumptive needs assessment
5. Develop an integrated water management system to address the project categories

TASKS

Please note the proposed study process is not necessarily sequential, and that most work tasks will in progress concurrently. There will also be an iterative process between Tasks #2 and #3 to fully develop the analytical tools.

TASK 1 – Stakeholder Appraisal

Description of Task

The objective of this task is to solicit stakeholder/advisory (executive) committee evaluations and recommendations regarding past and current aspects of river management. The purpose of this solicitation is to categorize areas of concerns and objectives derived from the stakeholder surveys, and to identify specific river management impacts on specific water users, at specific sites in the upper basin (stream reaches or particular gauges) for each of the flow regimes. The focus of this task is to develop a stakeholder's assessments of river management impacts as they pertain to: 1) Bureau of Reclamation water management operations; 2) implementation of various stakeholder agreements and decrees for recreational and environmental purposes; 3) and municipal upstream exchanges.

Based on results of the 2009 stakeholder meeting, and subsequent individual meetings with specific participants, it is anticipated that several key areas will need to be studied:

1. Releases from Turquoise Lake – use of the Mount Elbert conduit;
2. Reservoir elevations in Turquoise and Twin Lakes in late summer;
3. Identification of augmentation sources to offset well depletions;
4. Management alternatives for the Voluntary Flow Management Program during low, median, and high water years;
5. Management planning for Chaffee County's Recreational In-channel Diversion water right and associated water management planning for the FibArk Festival;
6. Spring-time flows to fishery enhancement between Twin Lakes and Pueblo Reservoirs
7. Exchange impacts on late summer flows at Wellsville;
8. Fill and spill sequencing, as it relates to the Winter Water Program and If-and-When storage contracts at Pueblo Reservoir.

Method/Procedure

This task will utilize results of the stakeholder list surveys developed for the CWCB's Arkansas River Decision Support System Feasibility Study. A list of historical management practices and their related stakeholder outcomes will be documented and prioritized based on the significance of the management impacts and the number of affected participants. This list of operational practices and associated impacts will be given to the advisory committee for final review and approval. The list will provide the basis for the analysis procedure to develop management alternatives to enhance stakeholder results, if possible for the three flow categories. It is anticipated that up to five study scenarios, involving various locations in the upper basin, will be developed and analyzed for the three flow regimes.

Deliverable

1. List of management concerns and associated operational alternatives that would, in the perspective of the specific user group, avoid or resolve current management issues, and/or enhance the efficiency of the water uses by the group.

2. One meeting with the ARKDSS advisory committee to approve selected study sites and number (up to five) management issues to be analyzed.

TASK 2 – Develop analytical tools incorporating a multidiscipline approach to address the hydrological, institutional legal, economical and social framework for Arkansas River water management.

Description of Task

The task is separated into three categories:

1. Review and assessment of historical streamflow conditions at strategic gage sites;
2. Compile and review strategic legal management obligation at specific river sites;
3. Compile and review institutional and intergovernmental agreements/operating rules affecting annual river operations.
4. Perform a multi-discipline professional analytical analysis to comprehensively address the various aspects of each designated study case

Method/Procedure

1. To assess hydrological conditions and water operations in the upper Arkansas River basin, it is anticipated a set of initial sites be utilized and will include Boustead Tunnel,

Turquoise and Twin Lake Reservoirs, Wellsville, and Portland gauge sites. Based on a review of stakeholder inputs for management modifications, other useful gauge sites may be added. The final study sites will be selected by the advisory committee. The objective of this analysis is to quantify the amount of water at specific points of the river during typical dry, average, and wet years. Multiple years from the 1980-2008 historical record, will be selected and classified into each respective categories. Water quantification at each study site will include combining flow data that will include Fyringpan-Arkansas total imports, Bureau of Reclamation releases from upper storage, other upper storage releases, and municipal upstream exchanges. Data bases for this task will be consistent with those used in the ARKDSS.

2. A review of the most significant decrees, as recommended by the Division Engineer and the U.S. Bureau of Reclamation, will be conducted, and the management requirements to implement these decrees will be identified for the analysis exercise. It is anticipated that much of this information will be generated as part of the ARKDSS Feasibility Study.

3. Intergovernmental agreements, state and federal permits, and all other operating guidelines (e.g. Fry-Ark operating objectives) will be compiled and catalogued. Operating rules derived from these documents will be incorporated into the development of the working analysis.

4. An intensive review of existing water management models will be performed to obtain data or modeling capabilities for purposes of this study. Pre-existing data bases and models will be utilized to the extent possible, to ensure that duplicate information systems or analysis are not needlessly developed.

5. Economic, business-planning, statistical, and risk-assessment professional analysis and applications will also be reviewed and selected based on appropriateness and usefulness of such analysis in developing and evaluating alternatives to meet specified goals and objectives.

Deliverable

1. Description of hydrologic conditions at strategically selected gage sites.
2. Development of a working river operations analysis incorporating key management criteria for Arkansas River annual operations for wet, average, and dry years.

Task 3 – **Stakeholder – Development of Alternatives**

Description of Task

1. The purpose of this task in to incorporate stakeholder management alternatives into the operations analysis and evaluate their feasibility and ease-of-implementation for high, average, and wet years. A sensitivity analysis will be performed to identify critical parameters for each alternative.

2. This task will provide new management alternatives, based on stakeholder input and addressing socio-economic considerations, not previously included in the working analysis. Solutions may involve parameters not considered in traditional administrative practices. These parameters may involve linking users to form new collaborative partnership to resolve high or low flow conflicts, or they may promote the development of economic incentives to alter time and place of historical water operations, and/or, in the simplest manner, provide better communication among stakeholders to more efficiently utilize water supplies to meet a higher level of stakeholder goals. As a result, a more comprehensive management design is anticipated, describing new management policy involving stakeholder partnership and economic consideration.

3. This task will also provide a baseline for which certain stakeholder recommendations will not be recognized as viable for river basin management. It is anticipated that the certitude of the analysis framework, as determined by the legal and institutional constraints, will eliminate certain alternatives. However, elimination of alternatives will be accompanied by a definitive explanation regarding the constraints and management analysis that prohibits such implementation.

Method/Procedure

1. Stakeholder suggestions/alternatives will be entered into the working analysis and evaluated on a series of criteria that includes, but is not limited to :
    a. Compliance with existing water right administration and other legal determinants
    b. Compliance with existing agreements, permits, and operating regulations
    c. Compatibility with federal, state, and local operating objectives and management

    The criteria will be applied to the three flow regime scenarios (high, average, low) independently, recognizing that the criteria may manifest itself in a specific type of year, but not in the others.

2. Study results will be discussed and analyzed with respect to technical and socio-economic components in a series of teleconferences and meetings. The purpose of these discussions will be to assess the feasibility – from each stakeholder group- regarding the proposed management alternatives. Separate individual meetings (discussions) with specific participants is anticipated, but no more than five (5) of these individual conferences are expected.

3. Alternatives will be classified as “feasible” or “non-feasible” based on the criteria listed above. Feasibility will be determined not only using current administrative practice, but will also consider new management strategies based on collaboration and cooperation among the stakeholders. Alternatives will link participants to develop new operational criteria that resolve or enhances overall water utilization.

    If an alternative is evaluated to be “infeasible,” a description will be provided detailing the precise determinant(s) for this evaluation.

4. Alternatives classified as feasible will be identified, ranked by “ease-of-implementation” standards, evaluated for impacts on overall river management and efficiency, and integrated into Roundtable objectives and needs assessments.

Deliverables

1. List of stakeholder alternatives
2. (3) Meetings with participating stakeholders to discuss hydrological results
3. (1) Meetings with Roundtable executive committee
4. List of infeasible alternatives
5. Ranking of “feasible” alternatives
6. Recommendations for implementation of “feasible alternatives”