



Notice of Intent

Plan Information for potential bidders

RFP # G21-001 for professional services

BELEN WATERSHED PLANNING DOCUMENTS EA/EIS

DESCRIPTION OF WORK

INTRODUCTION

The Middle Rio Grande Conservancy District (herein referred to as “MRGCD” or “District”) is offering the public advance notice of the future request for proposal for qualified Professional Planning/Engineering Firm(s) to develop the Belen Watershed Plan in Valencia County, New Mexico and adjacent to the City of Belen under the Watershed and Flood Prevention Operations Program (WFPO).

This advance notice will provide necessary information for qualifying offerors in preparation for the RFP that will seek to identify qualified/ licensed professional firm(s) to provide the services outlined in this document in compliance with the National Watershed Program Manual (NWPM) under the Natural Resources Conservation Service (NRCS).

These services will be funded by a federal grant provided by the Natural Resources Conservation Services (NRCS), under the United States Department of Agriculture (USDA) to the MRGCD. The planning documents must follow the policy set forth in NRCS Title 390, National Watershed Program Manual (NWPM), Part 505 and the NRCS National Engineering Manual, Part 511. This grant must also follow the Federal Uniform Guidance 2 CFR 200 under the Office of Management and Budget

OVERVIEW of OBJECTIVES

The overall goal of the Plan is to develop a comprehensive planning document that includes:

1. Technical Specification – Planning Services for the Belen Watershed Operation Plan- Environmental (NEPA) Document as described in the Specification section. This document must be prepared in accordance with the National Environmental Policy Act (NEPA) and related environmental and economic documentation requirements. Planning must follow the policy set forth in Title 390, National Watershed Program Manual (NWPM).
2. Requirements and Technical Specifications for Geologic and Geotechnical Investigations.
3. Meets the requirements of the US Department of Agriculture, Natural Resources Conservation Service, Middle Rio Grande Conservancy and the State of New Mexico.

Technical Specifications

For the purpose of contract administration and payments. The work is divided into the following four (4) Phases and related subsidiary items:

I. Phase I – Identify Problems and Determine Objectives

A. This phase will include but is not limited to determining MRGCD objectives and assisting the NRCS staff to determine, in consultation with the MRGCD, the local jurisdictions, and affected land users, the purpose and need for action. This phase will provide data showing the current and forecasted magnitude, extent, frequency and duration of flooding problems and associated natural resource concerns that are within the project scope such as flood damages to crops, homes, businesses, roads, bridges and other land and water quality issues. This phase will result in the preparation of a clear and concise purpose and need statement and supporting narrative that provides sufficient information to adequately demonstrate the underlying need and purpose for the proposed action. Although the specific needs and purpose may change during the planning process, it is anticipated that the primary categories of need for this project are as follows: flood protection and continued agricultural water management.

1. A need to relieve safety concerns resulting from the irrigation canals, originally constructed without any flood protection or water storage incorporated, not meeting NRCS and State safety standards for its current classification. As well as the maintenance thereof.
2. A need to continue the approximately 6,000 acre-feet of irrigation (agricultural water management).
3. A need to create flood prevention and continue irrigation water delivery, currently provided by the canal system in place, to a level to be determined in this phase of the work, with consideration minimally of the 100-yr storm event but, attenuating not less than the 25 year - storm event.

B. Subsidiary Items:

1. Evaluate Existing Site Conditions Including;

- a. Perform a record search of files of the NRCS, MRGCD, New Mexico Office of the State Engineer, Department of Transportation, local floodplain administrator, FEMA, and others as required for information relevant to planning to include:
 - i. best available base map/LiDAR data
 - ii. hydrologic and hydraulic files, design files, geology and geotechnical files
 - iii. irrigation canal system operation and maintenance plan, inspection reports, and reports of remedial actions
 - iv. irrigation canal system operational permit issued by the State
 - v. copies of deeds and easements
 - vi. project records and hydraulic models for potentially impacted bridges and culverts
 - vii. Flood Insurance Rate Maps (FIRMs), Letters of Map Revision (LOMRs), Conditional Letters of Map Revision (CLOMRs), Letters of Map Amendment (LOMAs) shall be obtained from FEMA's Map Service Center for upstream and downstream areas anticipated to be impacted by the project.
 - viii. Flood Insurance Studies (FISs) and the hydraulic models used in the FISs shall be obtained from FEMA if available for those same areas
- b. Perform a visual inspection of the watershed site (including the irrigation canals) in accordance with NRCS – New Mexico dam inspection procedures including all areas of embankments and non-earthen components including the culverts/conduits, gates, trash racks, spillways and outlet/transfer structures.
- c. Perform and record a closed caption television (CCTV) inspection of any conduits crossing state and/or county roads, railroads or interstate highways and a narrative report with photographs.

- d. Locate and determine elevations of established benchmarks on or near the canals and perform a topographic survey of the prominent watershed features from which profiles and cross sections of the impoundments, conveyance, overflows, and culverts can be derived as well as key elevations of potential flood water storage areas for evaluation of flood water storage, sediment settlement or other adverse movements and for hydraulic and other engineering analyses work. Also obtain typical canal/channel cross sections and configuration data at bridges and culverts needed for developing hydraulic models where as-built data is not available. Additional geologic survey requirements will be in the RFP and are part of that phase of work. Obtain elevations of the lowest adjacent grade of homes, roads, water sources, utilities, burial sites, and historical sites downstream of the irrigation canals that would be expected to be inundated by a probable maximum precipitation (PMP) event.
- e. Obtain elevations of the lowest adjacent grade, first point of entry, and lowest floor of habitable buildings and buildings containing valuable property located downstream of the irrigation canals that may be in the areas where it is anticipated the water surface profile for the irrigation canals and flood water storage structures in-place condition is higher than for the irrigation canals non-existent condition.
- f. Conduct a sediment survey of the reservoir including submerged and aerated sediment and compute the current submerged sediment capacity, aerated sediment capacity, floodwater-retarding capacity, and floodwater retarding pool. Using this sediment survey and as-built topographic information compute the historic sediment deposition and average annual rate of sediment deposition. Estimate a future sediment rate using NRCS guidance and forecasted land use in the drainage area of the irrigation canals and flood water storage structures. Consultation with the NRCS State Geologist or Engineer is required throughout this work item.
- g. Prepare a topographic map of the irrigation canals and flood water storage structures site. The reservoir area above the normal water surface and/or above areas of aerated sediment survey may rely on the best available topographic/LiDAR information. Topography shall extend to 10 feet above the existing top-of-canals elevation.

- b. Quantify current and future land uses based on NEH Part 630, chapters 8 and 9 guidance and create maps to be incorporated in the Plan-Environmental Document. Land uses within the watershed's (existing irrigation canals/planned flood water storage structures) drainage area shall be mapped manually based on the most recent aerial photography or other more recent sources. Land for the remaining watershed (downstream of the irrigation canals) may be based upon the most recent land-use / land-cover mapping available from New Mexico or other sources approved by the NRCS Government Representative and revised to NRCS land use classes described in NEH Part 630, Chapters 8 and 9. Land uses shall be identified for the fully developed condition based on current development trends and available forecast information from local government land planning and zoning offices and/or local and regional economic development organizations and based on environmental and social limitations through the life of the project (50 to 100 years). Provide GIS based maps showing future land use coverage.
- c. Develop NRCS weighted curve numbers with antecedent runoff condition II (ARC II) for existing and future conditions using the most recent NRCS procedures and hydrologic soil groups.
- d. Identify precipitation depths and distributions using TR-60, NEH Part 630 chapter 21, NOAA Atlas 14, and HMR 55A and/or NM-CO REPS (which ever provides the more conservative amounts in consultation with MRGCD and NRCS).
- e. Compute times of concentration (T_c) for existing and future conditions for sub-basins upstream of the irrigation canals and flood water storage structures and for major tributaries downstream of the irrigation canals, as needed to develop tributary hydrographs to account for hydrograph timing effects when routing downstream steady hydraulic models. Note however that steady discharge assumptions, such as base flow, may be made for tributary drainage areas significantly smaller than that of the irrigation canals and flood water storage structures.

- f. Develop stage-area/storage ratings as necessary based on the survey results using the calculated floodwater-retarding capacity of the irrigation canals and accounting for future end of life (50- to 100-years) aerated sediment. Use the NRCS SITES or Army Corps of Engineers (ACOE) HEC-HMS computer program to determine State-discharge ratings for standard covered risers, where applicable, where incorporates the procedures of TR-29, Hydraulics of Standard Covered Risers. Develop stage-area/storage ratings as necessary based on the survey results using the calculated floodwater-retarding capacity of the irrigation canals and accounting for future end of life (50- to 100-years) aerated sediment. Use the NRCS SITES or Army Corps of Engineers (ACOE) HEC-HMS computer program to determine Stage-discharge ratings for standard covered risers, where applicable, which incorporates the procedures of TR-29, Hydraulics of Standard Covered Risers
- g. Deliverable items include the above-mentioned maps and narrative for the appropriate sections of the Plan-Environmental Document.

4. Perform a beach inundation analyses as follows:

- a. The minimum breach discharges will be determined by the criteria in TR-60. Irrigation canals and flood water storage structures failure flood profiles and inundation maps shall be developed in HEC-RAS unsteady 1-d flow or 2-d flow models, or as determined by the NRCS in consultation with the MRGCD. Inundation areas will be mapped downstream to where irrigation canals and flood water storage structures failure profiles converge to within one foot of currently effective regulatory 100-year flood elevations or to within one foot of the 100-year flood elevations determined in Subsidiary Item I.7 "Frequency-based Flood Routings". The points of downstream routing termination must be concurred by NRCS for each inundation area modeled. Documentation shall include location and description of existing and forecasted development in the downstream valley (houses, commercial and farm structures, industrial facilities, utilities, highways, railroads, and also critical structures and facilities such as schools, hospitals, nursing homes, prisons, emergency response stations, hazardous material storage, critical transportation and utility facilities, etc.). Inundation maps showing and labeling the irrigation canals and flood water storage structures location and potential hazard locations shall be prepared using base maps with the latest high-resolution aerial photos or other high-resolution data. USGS quadrangle maps are not considered an acceptable high-resolution contour map.
- b. Minimum modes of failure for irrigation canals and flood water storage structures failure modeling and inundation mapping shall include:

- i. The hydrologic breach inundation area will be determined by routing a breach hydrograph downstream beginning just downstream of the irrigation canals and flood water storage structures. The constructed breach hydrograph shall use a minimum peak breach discharge computed in accordance with TR-60 assuming the worst-case reservoir water surface elevation at the crest of irrigation canals and flood water storage structures embankment or at the maximum water surface elevation obtained by routing a 6- or 24-hour inflow hydrograph developed using the probable maximum precipitation through the irrigation canals and flood water storage structures. A spreadsheet tool to compute TR-60 minimum peak breach discharges and to construct breach hydrographs is available from the NRCS upon request. Alternately, the process-based model WinDAM may be used.
 - ii. The static breach inundation area will be determined by routing a breach hydrograph downstream beginning just downstream of the irrigation canals and flood water storage structures. The constructed breach hydrograph shall use a minimum peak breach discharge computed in accordance with TR-60 assuming the reservoir water surface elevation is at the crest of the auxiliary spillway elevation or at the maximum reservoir water surface elevation obtained by routing a 100-yr-generated inflow hydrograph through the irrigation canals and flood water storage structures, whichever is higher.
 - iii. Seismic breaches will be computed by routing a breach hydrograph downstream beginning just downstream of the irrigation canals and flood water storage structures. The constructed breach hydrograph shall use a minimum peak breach discharge computed in accordance with TR-60 assuming the reservoir is at the crest of the principal spillway (permanent pool) elevation or in the case of significant base flows at the reservoir water surface elevation obtained by routing the base flow through the irrigation canals and flood water storage structures.
- c. Deliverable items include models and inundation maps and written narratives for the appropriate sections of the Plan-Environmental Document including revisions to the “Evaluation of Potential Rehabilitation Projects” worksheet. Electronic input and output files in their native formats for all models and ESRI Shapefiles of the breach inundation areas shall be delivered as part of the Project Folder Hazard Classification Evaluation.

5. Evaluate and recommend hazard classifications for the existing irrigation canals and flood water storage structures and proposed structural rehabilitation alternatives as follows:

- a.** The hazard classification evaluation shall consist of evaluating the existing and future upstream and downstream areas for potential hazards. This shall consist of using the breach mapping outlined above, downstream development, zoning, and identifying potential hazards. The irrigation canals and flood water storage structures shall be classified according to NMOSE definitions and NRCS definitions in the NEM Manual, Part 520, Subpart C – DAMS. In cases where the hazard classification cannot be clearly determined because it is not clear from available mapping whether habitable buildings or buildings containing valuable property are within the worst-case breach inundation zone or where property damage and population at risk cannot be estimated based on available mapping and existing surveys, a field survey of the lowest grade adjacent the structure along with other useful elevations depending on accessibility, such as the first point entry, first floor, and lowest floor (basement), will be made. Unless a structural alternative involves a feature that would increase or decrease the population at risk it will likely not be necessary to perform additional irrigation canals and flood water storage structures failure (breach) routings.
 - b.** Deliverable items include the written analyses for the appropriate sections of the Plan-Environmental Document.

6. Perform Hydrologic and Hydraulic Evaluation of the Existing Irrigation Canals

- a.** This activity includes performing hydrologic and hydraulic (H&H) analyses to evaluate the sizing and proportioning of the irrigation canals embankments and flood water storage structures with associated spillways and the stability and integrity of the existing irrigation canals for the current hazard classification in accordance with the criteria contained in TR-60 and in accordance with the NMOSE and applicable design code/criteria including special considerations for water systems/rights, if applicable.

 - a.** H&H analyses will be conducted using the NRCS SITES or Army Corps of Engineers HEC-HMS/RAS/RAS-2D computer programs, for determining compliance with TR-60 and other NRCS guidance.
 - b.** Deliverable items include the written narrative for the appropriate sections of the Plan-Environmental Document. Electronic input and output files in their native formats for all models shall be delivered as part of the Project Folder.

7. Perform Routings of Frequency-based Floods:

NRCS will need to determine the flood recurrence events to model based on the existing and future land use and other considerations. If the only concern is for agricultural flood damage to crops, routing unsteady 2-, 5-, 10-, 25-, 50-, and 100-year recurrence events is important. If there is concern about potential “urban” flood damages (buildings and infrastructure) the 100-year and 500-year steady routings and inundation maps are required. If there are critical structures and facilities (schools, hospitals, nursing homes, police and fire stations, prisons, critical transportation and utilities, water and waste-water treatment facilities, hazardous storage facilities, etc.) in the vicinity then the NRCS must identify and consider the need of providing protection for the 500-yr flood for those critical structures and facilities. Also, since MRGCD is required to comply with the National Flood Insurance Program requirements and rehabilitating irrigation canals and creating flood water storage structures can result in a physical hydrologic change (upstream and/or downstream), submittal of new H&H data to FEMA may be required so that risk premium rates and floodplain management requirements can be adjusted. Submittal of new information is done after (no later than 6 months) construction, however the “community” may request FEMA’s comment on whether the proposed project would justify a map revision (a Conditional Letter of Map Revision, CLOMR). Whether before or after construction a technical data submittal to FEMA may be required for the community and MRGCD to comply with the NFIP. This submittal must use the same recurrences as that used in any existing Flood Insurance Studies (FIS) in the affected reaches (upstream or downstream) such as the 10-, 50-, 100- and 500-year events. Refer to GM 410.25, regulation 7 CFR 650.25, and NFIP regulations 44 CFR 65.

This activity includes routing floods to determine flood impacts upstream and downstream for the purpose of informing NRCS, MRGCD, local jurisdictions, and affected land users of flooding conditions so that NRCS in consultation with those stakeholders can determine the purpose and needs of the project; and for the purpose of identifying, formulating and evaluating alternatives for Phase III. This activity will include:

- a. Routing unsteady 24-hour-duration 2-, 5-, 10-, 25-, 50-, and 100-year recurrence-interval floods downstream of the irrigation canals and flood water storage structures and evaluating agricultural flood damages for the existing-irrigation canals condition, the irrigation canals and flood water storage structures non-existent (decommissioned) condition, and for all alternatives identified in Phase II. The flood routings will be terminated at the furthest point downstream where all alternatives have no more discernible impact than that of the worst-case flood condition, the irrigation canals and flood water storage structures non-existent condition.

- b. Routing steady 24-hour-duration 10-, 25-, 50-, 100-, 200- and 500-year recurrence-interval floods downstream of the irrigation canals and flood water storage structures and evaluating urban flood damages for the existing-irrigation canals, the irrigation canals and flood water storage structures non-existent (decommissioned) condition, and for all alternatives identified in Phase II. The flood routings will be terminated at the furthest point downstream where all alternatives have no more discernible impact than that of the worst-case flood condition, the irrigation canals and flood water storage structures non-existent condition.
- c. Inflow hydrographs developed for the above hydraulic routings will be based on NOAA Atlas 14 precipitation values and the appropriate storm distributions developed by the NRCS.
- d. Inflow hydrographs and hydrologic routings through the existing irrigation canals and rehabilitated irrigation canals and flood water storage structures alternatives will use the NRCS SITES or Army Corps of Engineers HEC-HMS computer program. Downstream hydraulic routings will use the HEC-RAS computer program in steady or unsteady mode, as specified above, and 1-D or 2-D as is most appropriate. HEC-RAS models shall be created based on the best and most current maps and data available from NRCS – New Mexico, FEMA, New Mexico Department of Transportation, Valencia County, City of Belen, and concerned administrators of local communities such as Pueblos, etc., or be developed from the most recent high-resolution LiDAR data and/or additional field surveys. If a Flood Insurance Study (FIS) exists downstream of the irrigation canals and flood water storage structures, the hydraulic model will be obtained from FEMA and consideration given to using that model for these required routings to comply with NFIP regulation 44 CFR 65.6(8).
- e. Flood inundation maps for all recurrences and conditions will be developed in reach lengths that present a useful visual scale for identifying features including buildings, roads and critical facilities to assist the NRCS (in consultation with MRGCD, local jurisdictions, 13 of 24 August 2020 and affected land users) determination of the purpose and need for flood prevention/protection.
- f. Deliverable items include flood inundation maps and written narrative for the appropriate sections of the Plan-Environmental Document including the Investigations and Analyses Report provided in RFP. Electronic input and output files for all models and ESRI Shapefiles of the flood inundation areas shall be delivered as part of the Project Folder.

8. Public Participation and Scoping:

- a. Public participation during this subsidiary item will be conducted in accordance with an approved PPP (public participation plan) and will include early opportunities for public and agency input through scoping. Coordination with other Federal, State, or Tribal Governments shall be conducted during development of the plan environmental document. MRGCD will ensure draft letters of invitation for NRCS signature to agencies that have specific expertise or jurisdiction by law (such as permitting authority) to be cooperating agencies in the planning process and preparation of the NEPA document. Those agencies will likely include US Fish and Wildlife, the US Army Corps of Engineers (USACE), the Federal Emergency Management Agency, the New Mexico Office of the State Engineer, the State Department of Transportation, and affected local floodplain zoning administrators. Public meetings will be coordinated with the MRGCD and NRCS and will be publicized in accordance with NRCS policy. NRCS must officially be the lead for any public scoping meetings on the Draft and Final Plan-Environmental Document, however the MRGCD shall organize, manage, and take minutes of such meetings, with assistance from the NRCS. Results of public participation will be used to develop the scope of environmental document. Scoping will be used to identify the significant issues to be analyzed in detail and to eliminate from detailed study the issues that are not significant. In defining the scope of issues to be addressed in the plan-environmental document, detail and attention shall be focused on connected and cumulative actions associated with the proposed action such as regional water resource plans, bridge replacement planning, and active Conditional Letters of Map Revision. Public participation results will be documented and summarized in the "Consultation, Coordination and Public Participation" sections of the Plan-Environmental Document.
- b. A PPP will be developed, including development of a comprehensive mailing list of agencies, groups and individual stakeholders, in consultation with MRGCD and NRCS. The plan will outline agency, State Historic Preservation Office (SHPO) and Tribal consultations. MRGCD shall be the official lead for general public participation meetings on the project and responsible for organizing, managing, and taking minutes of such meetings, with assistance from MRGCD. The NRCS is the official lead for any NEPA scoping meetings on the Draft or Final Plan-Environmental Document; however, MRGCD will organize, facilitate, and take minutes of such meetings, with assistance from the NRCS.

II. Phase II – Inventory Resources and Analyze Resource Data

A. This phase may include, but is not limited to, conducting the resource inventories of the watershed by collecting information on the resources (environmental, economic, and social) that could be impacted by the project. Inventories will be adequate to establish ecological, archeological, and social baseline conditions which are linked to environmental laws, Executive Orders, Codified Federal Rules, scoping issues, and/or NRCS policy. All study/inventory should be commensurate to the level of concern associated with the resource. General descriptions of the various ecological resources will normally suffice. For example, complete inventory of all common species of plants, fish, and or invertebrates present is usually not needed or appropriate. This information will provide the basis for forecasting project effects. Public/agency scoping sessions may result in additional inventories. The types of resources to be considered can be found in the NWPM Part 501.24 B:

B. Subsidiary Items:

1. Environmental (refer to NRCS CPA-52)

- a. Identify soils that are pertinent to the rehabilitation alternatives and create a map to be incorporated into the Plan-Environmental Document. This may require on-site sampling of mapped soils for verification.
- b. Identify wetland types and approximate acres using the Cowardin System for areas upstream and downstream of the irrigation canals and flood water storage structures site that may be impacted by any of the alternatives identified in Phase II.
- c. Conduct wetland determinations and delineations and develop maps for wetlands that may be present and potentially impacted by the project. This may include upstream and downstream areas, and areas potentially impacted by construction activities (dikes, floodwalls, construction access roads, etc.). Current USACE methodology and/or NMOSE methods and requirements (as applicable) will be utilized. Wetland determinations will need to be flagged or surveyed in the field for the Plan-Environmental Document. To the extent appropriate, off-site wetland determination methodologies based on aerial photography and other sources will be utilized with appropriate field verification.
- d. Determine historic and current land use. Identify land use classification in acres (see NHCP).
- e. Establish air quality conditions. (Based on readily available information. Air quality testing should not be required).

- f. Identify water quality conditions in terms of designated uses. (Based on readily available information. Water quality testing should not be required).
- g. Identify highly erodible cropland.
- h. Characterize the floodplain impacted by any alternative upstream and downstream of the project area.
- i. Characterize fish and wildlife habitat and generally describe species composition (sampling usually not required).
- j. Identify Threatened and Endangered Species population(s), including State listed species in the project area.
- k. Conduct Phase 1 cultural resource investigation.
- l. Characterize federally listed Threatened and Endangered critical habitat as well as that related to State listed species.
- m. Characterize “Invasive Species” populations.
- n. Characterize water quantity concerns.
- o. Determine the topography of the project area.
- p. Determine the climate of the project area.
- q. Identify/characterize riparian areas.
- r. Identify natural areas. (Specially designated areas).

2. Social

- a. Document historic (at time of irrigation canals and flood water storage structures installation or 20 to 30 years ago) and current watershed demographics (population, income, and poverty) which is to include an identification of any Environmental Justice Communities and Tribal communities.
- b. Characterize public health and safety conditions.
- c. Characterize commercial and residential structures affected and to what extent.
- d. Characterize transportation networks and conditions.
- e. Identify social/political factors that may impact land use in for the life of the project.
- f. Identify any population centers.

3. Economic

- a. Quantify current on-site and off-site damages/effects (amount, extent, duration).
 - (i) Urban flood damages such as houses, commercial buildings, roads, bridges, rail, and utility damage.
 - (ii) Ag flood damages such as crops, farm structures, and other rural infrastructure damage.
 - (iii) Water Supply effects and costs for the most likely alternative without PL 83-566 assistance.

- (iv) Recreation analysis to include documenting current primary and secondary contact recreation user days by recreation activity.
 - b. Quantify enterprise input costs.
 - c. Quantify current productivity.
 - d. Quantify operations, maintenance and replacement costs.
4. Deliverable items include the written portions for the appropriate sections of the Plan-Environmental Document and data sources for of the plan; maps in paper and PDF versions, as part of the Project Folder; and ESRI shapefiles of resources that were mapped.

III. Phase III – Alternative Formulation, Evaluation, and Decision

A. This Phase will include but is not limited to; formulation of alternatives and evaluation including performing hydrologic and hydraulic analyses to determine upstream and downstream flood impacts to property and currently effective floodplain zoning, evaluation and comparison of the ecological, cultural, economic and social effects of alternatives, public participation called for in the PPP Plan, identification of the NEE Plan, MRGCD’S alternative, and the preferred alternative.

B. Subsidiary Items:

1. Public Participation

Public participation during this subsidiary item will be conducted in accordance with the PPP. Results of public participation will be documented as described in Phase I.

2. Formulate and Evaluate Alternatives

a. This activity includes development, evaluation, and comparison of reasonable alternatives. In addition, a no-action alternative describing the most likely action by others without federal assistance must be developed. All federally assisted alternatives are to be developed to address the purpose and need of the project. For structural rehabilitation alternatives, only those that rehabilitate the irrigation canals and flood water storage structures to NRCS and NMOSE Safety criteria will be considered.

Consideration shall be given to decommissioning the irrigation canals and flood water storage structures and to any applicable non-structural alternatives such as floodproofing or relocating upstream and/or downstream structures, floodplain regulation, acquisition of floodplain lands for recreational, fish and wildlife, and other public purposes, conversion of land use to forest, and relocating downstream hazard locations in the breach inundation area and purchasing flowage easements in the breach inundation area to preserve a lower hazard classification. Additionally, in accordance with PRG and/or NRCS regulation and policy, the following alternatives shall be identified:

- i. The locally preferred (MRGCD) alternative
- ii. A non-structural alternative (least-cost combination of structural and non-structural features)
- iii. Environmentally preferred alternative (for an EIS)
- iv. The Net Economic Efficiency (NEE) alternative

The MRGCD will document consideration of completeness, effectiveness, efficiency, and acceptability of the alternatives.

b. MRGCD will perform preliminary analyses and evaluations of alternatives and determine in consultation with the NRCS which alternatives can be eliminated from detailed study and which will be carried forward to detailed study. The No Action or Future without Project alternative will be carried forward to detailed study. An alternative that decommissions the irrigation canals and flood water storage structures and meets the purpose and need will be considered but may be eliminated from detailed study if found to be unreasonable.

Any alternative, except no-action, that does not meet the stated purpose and need for federal action will not be considered in detail. Alternatives that meet the need for action but do not achieve the purposes may be eliminated from detailed study. Alternatives that may appear reasonable but clearly become unreasonable because of exorbitant cost, logistics, existing technology, or environmental reasons will be eliminated from detailed study. Certain structural (irrigation canals and flood water storage structures) rehabilitation alternatives, may meet the irrigation canals and flood water storage structures safety need but result in increased maximum reservoir water surface elevations or increased downstream peak discharges and water surface elevations negatively impacting upstream and/or downstream floodplains. Those impacts may be determined by evaluation of flood routing results to judge whether an alternative is unreasonable or if it should be carried forward to detailed study.

Alternatives eliminated from detailed study will be documented in the Plan-Environmental Document and the reasons for elimination discussed. All considered alternatives will be documented as part of the administrative record.

- c. The following will be performed for alternatives to be studied in detail.
 - i. Alternatives will be described and compared in substantial and equal detail including the preparation of preliminary drawings showing existing and proposed features of the alternatives including borrow, spoil, and staging areas and including the preparation of refined cost estimates for installation, operation and maintenance, and cost sharing.

- ii. Preliminary structural analysis and embankment stability analysis will be performed to verify feasibility.
- iii. Economic analysis will be completed according to the requirements of the National Watershed Program Manual, the Principles, Requirements, and Interagency Guidelines for Water Resource Projects (PR&G) and the National Resource Economics Handbook part 611 – Water Resource Handbook for Economics and procedures applicable to monetary economic analysis contained in Chapter 2 of Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G).
- iv. Determine the economic benefits and costs of all reasonable alternatives, including the future Without Project (PR&G FWOFI). Evaluate costs associated with the irrigation canals and flood water storage structures and benefits retained, lost or added in the alternatives.
- v. Economic evaluations will be conducted using the current Federal Watershed Project Discount Rate. The rate changes in October of each year and can be found at http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/eco_n/
- vi. The project period of analysis (evaluation life plus implementation period) must be for the time over which any alternative has significant beneficial or adverse effects, usually 100 years for a NRCS high hazard potential irrigation canals and flood water storage structures, but not less than 50 years. Since sediment life is usually the limiting factor for evaluated life, an economic evaluation will be performed to determine the longest sediment life that continues to provide net benefits. A sediment rationale will be described for each structural rehabilitation alternative that spans the entire evaluated life.
- vii. Formulate project based on the principles outlined in the NRCS NWPM (In particular, Parts 501.11 A (2); 501.12. C; 505.35 B (1) (iii)-(iv); 505.35 E-F).
- viii. Determine average annual values for all costs and benefits associated with each evaluated alternative.
- ix. Determine net monetary benefits and benefit/cost ratios for all with project alternatives (Future with Federal Investment under PR&G) as compared to the no action (Future Without Federal Investment).
- x. Develop an economic section, Investigations and Analyses Report, that details the methods, assumptions, and data to support the economic analyses and results. Further, disclose any monetizable benefits that were not evaluated along with the rationale for not developing the values. As part of this section disclose how not developing these monetized benefits will not affect the identification of the correct NEE plan.

- x. Complete all required economic and structural tables per the NWPM Section 506, subpart B and NWPH Section 606, Subpart B and NWPH, Subpart B.
 - xi. The upstream and downstream flooding effects, damages, and hazards of all alternatives studied in detail will be determined and described using procedures described in Subsidiary Item 7 in Phase I.
 - xii. Where applicable and substantially changed from the existing irrigation canals and flood water storage structures condition, a description of the hazard potential of each alternative will be determined and a rationale for the hazard classification documented.
 - xiii. Major resource concern items to be used in the decision-making process will be evaluated, compared, and discussed in the Plan-Environmental Document including at a minimum those resource concerns determined to be relevant in the scoping process. The economic, environmental, and social effects will be discussed for each alternative studied in detail along with the significance of the effects and measures to reduce or eliminate adverse impacts.
- d. The preferred alternative will be identified as the reasonable alternative that maximizes net public benefits to society. Identification of the tentative Preferred Alternative and other identifications per PR&G for water resource projects will include:
- i. Identify the alternative that meets technical requirements and best addresses the environmental, social, and economic concerns for the rehabilitation of the structure, which is the one that maximizes public benefits relative to cost, as the Preferred Alternative.
 - ii. Work with MRGCD to determine the Preferred Alternative.
 - iii. Work with NRCS to identify the Non-Structural alternative, if it exists, that best meets the federal objectives and Guiding Principles of PR&G. The non-structural alternative is to be a reasonable alternative which will contain nonstructural works and may contain structural works.
 - iv. Work with NRCS to identify the Environmentally Preferred alternative if the environmental document is an EIS.
 - v. Work with NRCS to identify the NEE alternative. Use this alternative as a basis for comparison of other federally assisted alternatives to highlight their environmental and social trade-offs.
 - vi. Develop a Summary and Comparison Table to summarize the trade-offs of monetary and non-monetary benefits and costs of all alternatives. The analysis will include comparison of alternatives relative the PR&G federal objectives, and guiding principles, monetary and nonmonetary effects using an ecosystem services framework, and trade-offs of monetary and non-monetary effects among alternatives.
 - vii. The preferred alternative will be described along with rationale for the preference. Economic and structural tables will be prepared.

- e. Deliverable items include written narratives for all alternatives for the appropriate sections of the plan-environmental document, cost estimates, and preliminary drawings for all alternatives studied in detail, upstream and downstream floodplain inundation maps for the frequency-based floods modeled for each alternative studied in detail, economic and structural tables for the preferred alternative.

IV. Phase IV – Preparation of Plan-Environmental Document

A. This Phase will include but is not limited to: development of the Initial and Preliminary Plan-Environmental Document for technical review by NRCS – New Mexico, MRGCD, and others directly involved in the planning; review of the document by the NRCS National Water Management Center (NWMC); addressing comments from the NWMC review and preparation of the Draft and Final Plan-Environmental Document based on public and interagency comments. The Plan-Environmental Document will be presented in a document following the format as described in NWPM Part 501.31, Plan Format Outline and address each item as described in Sections 501.32 through 501.4

B. Subsidiary Items

1. Preparation of Initial Version of the Preliminary Plan-Environmental Document Report for NRCS\MRGCD Review

- a. Prepare initial version of Preliminary Plan-Environmental Document for review by NRCS – New Mexico, MRGCD, and others directly involved in planning.
- b. Provide NRCS – New Mexico with 2 hard drives or thumb drives, MRGCD with 2 hard drives or thumb drives for review and concurrence, or other agreed upon digital format.
- c. Respond to all NRCS – New Mexico and comments in writing.

2. Preparation of Preliminary Plan-Environmental Document for NRCS NWMC Review

- a. Prepare Preliminary Plan-Environmental Document, incorporating and addressing comments from NRCS and MRGCD's review of the initial version of Preliminary Plan-Environmental Document. Provide 2 hard drives or thumb drives to NRCS – New Mexico for review and concurrence.
- b. Once concurred by NRCS – New Mexico, provide NRCS – New Mexico 2 hard drives or thumb drives and 6 hard (printed) copies. NRCS – New Mexico will forward to the NWMC for an approximate 30 calendar day review. Additional supporting documentation may be requested by the NWMC and will be provided to NRCS – New Mexico upon request.

3. Address NWMC Comments and Concerns

- a. The NWMC will provide draft comments and concerns to NRCS – New Mexico. MRGCD will have the opportunity to comment on these draft comments before final NWMC Comments and Concerns are provided to the NRCS. A response will be provided in writing, to each of the final comments along with the required changes in the Plan-Environmental Document. The NWMC comments will be reviewed and addressed.
- b. The deliverables are the written response to the final NWMC comments incorporated into the draft document and also in a separate stand-alone document submitted to NRCS.

4. Preparation of Draft Plan-Environmental Document

- a. NRCS and MRGCD will meet to review responses to the NWMC comments on the Preliminary Plan-Environmental Document. MRGCD will incorporate NRCS's comments in the Draft Plan-Environmental Document.
- b. The deliverable is a Draft Plan-Environmental Document that incorporates the changes agreed to from the review and discussion of the NWMC comments. MRGCD will submit 2 hard drives or thumb drives to NRCS – New Mexico for review and concurrence.

5. Public Participation

- a. Facilitate a public and interagency review of the Draft Plan-Environmental Document as appropriate in accordance with the PPP.
- b. The deliverables include specific and summary responses to public and interagency comments of the Plan-Environmental Document (see NWPM 501.45A and NWPH 601.45A).

6. Preparation of Final Plan-Environmental Document

- a. NRCS and MRGCD meet to review comments from the public meeting and resolve the response to public comments on the Preliminary Plan-Environmental Document.
- b. The deliverable is a Final Plan-Environmental Document that incorporates the changes agreed to from the review and discussion of the public comments. MRGCD will submit 3 hard drives or thumb drives to NRCS – New Mexico for review and concurrence.

7. Identify Expected Permits and Mitigation

- a. MRGCD will identify and list expected permits required for the rehabilitation project.
- b. MRGCD will identify likely compensatory mitigation based on coordination with federal regulatory agencies such as U.S. Fish and Wildlife Service and U.S. Army Corps of Engineers.
- c. The deliverable for this item shall be a list of expected permits and mitigation requirement included in the Plan-Environmental Document.