REQUEST FOR QUALIFICATIONS

YADKIN COUNTY
NORTH CAROLINA

October 14, 2019

Professional Architectural Services
For the following project:

A: Watershed Rehabilitation Planning for Deep Creek Structures #19 & #21

Introduction
Yadkin County is located in the Yadkin Valley area of the state, just west of the piedmont triad area. The county is rural in nature with four municipalities and a population of approximately 38,000 people.

Project Summary
The Deep Creek Watershed project was started in 1957. Several watershed structures were constructed along North and South Deep Creek in order to reduce downstream flooding. These structures have met their projected lifespan and are in need of repair. This project will outline this need.
All local, state and federal laws, rules and ordinances must be followed during this project.

Issuing Officer / Contact
Questions and requests for clarification regarding this RFQ must be submitted in writing to in:

Jason Walker
PO Box 220
217 E. Willow Street
Yadkinville, NC 27055
Email: jwalker@yadkincountync.gov

General Comments

Architectural firms interested in responded to the RFQ must submit a **Letter of Intent** to the Issuing Officer/Contact no later than **October 25, 2019**. **A Letter of Intent is required in order to be considered.**

The County reserves the right to approve all personnel working on these projects. Key personnel may not be removed, reassigned or replaced without prior approval from the County.

Yadkin County encourages participation by minority and women-owned businesses and respondents should be prepared to provide evidence of such classification and/or attempt to engage such firms within the qualification's package.

Yadkin County will not be responsible for the failure of any email delivery service to deliver a proposal response prior to the due date and time. It is solely the Respondents' responsibility to: 1) ascertain that they have all required and necessary information, documents and addenda prior to submitting a response, 2) ensure that the response is received at the correct location and time (late responses, regardless of delivery means will not be accepted), and 3) the response is free of errors and complies with the request.

The County reserves the right to reject any and all RFQ submittals or any portions thereof, and to select the RFQ which in its opinion is in the best interest of the County. Proposals are not to include price or hourly rates. Price and contract negotiations will begin once the architectural firm(s) selection has been made.

Scope of Services

Please see Attached Plan of work. In addition to the deliverables listed in the plan of work, any other services customarily furnished by an Architect and its consultants on similar projects.

Amendment to the RFQ

If it becomes necessary to revise any part of this RFQ, addenda will be issued to all **professionals who have submitted a Letter of Intent to propose**. The Professional in the proposal must acknowledge all addenda. Additionally, only submitted written questions may be addressed in Addenda; verbal questions and responses are not official and in no way change the requirements of this RFQ. The RFQ may be amended or withdrawn at any time by Yadkin County.

Proposal Requirements

- Corporate background, experience and statement of qualifications
- Project staffing and organization including key principal and associate staff; identification of any associate firms and their key principal and associate staff and their responsibilities
- Identification of Team Project Manager
- Project Team organizational chart

- Detailed resumes of the project team members and relevant project experience
- Minimum five (5) client references from similar projects within the last 5-6 years including telephone number and email contact information
- Evidence of understanding the Scope of Work
- Describe the anticipated project approach including work plan, proposed meetings, schedule, scope of work and approach to project budget control including if a third-party cost control consultant will be utilized
- Describe in detail steps that will be taken by your team to guard the Owner against defects and deficiencies in the work of the contractors during the construction phase
- Explain how your team manages the process of reviewing subcontractor submittals, clarification requests, and issuance of bulletin drawings, reviews of contractors' cost proposals, review and justification of change orders, payment requests, final inspections and assembly of the project close-out documents.

Important Dates

- October 25, 2019 by 5:00pm Letter of Intent to propose submitted to the County
- Pre-Proposal Site Visit – November 1, 2019 at 10:00am.
- November 8, 2019 by 5:00pm RFQ submission deadline to the Issuing Officer

Selection Criteria

Yadkin County will use a combination of criteria in the evaluation process, including, without limitation, overall qualifications, relevant experience with comparable facilities, references and such other as Yadkin County may use in its sole discretion.

- Specialized, appropriate expertise for the type of project
- Organizational chart and project team expertise
- Proposed design approach and innovative design solutions for projects of these types
- Project quality control plan including recent experience with cost control, change orders, and maintaining design and construction schedules
- Current workload of the firm's personnel
- Record of successfully completed projects without major legal or technical problems.

NRCS WATERSHED REHABILITATION PROGRAM

PLAN OF WORK

SUPPLEMENTAL WATERSHED PLAN AND ENVIRONMENTAL DOCUMENT

FOR

DEEP CREEK WATERSHED - DAM #19A AND DAM #21
YADKIN COUNTY, NORTH CAROLINA

A. INTRODUCTION

This plan of work (POW) provides the requirements to complete a Supplemental Watershed Plan and Environmental Assessment, hereinafter referred to as the Plan-Environmental Document and all the necessary supporting data for Deep Creek Dam #19A and Deep Creek Dam #21. Planning must follow the policy set forth in the Title 390, National Watershed Program Manual (NWPM), which is incorporated by reference. A copy of NWPM can be downloaded from the USDA-Natural Resources Conservation Service (NRCS) eDirectives website http://directives.sc.egov.usda.gov .

The Plan-Environmental Document will describe alternatives, and examine reasonable alternatives in detail and identify the preferred alternative as the most technically, economically, socially and environmentally defensible alternative as determined by NRCS in consultation with the Project Sponsor. The Plan-Environmental Document must be prepared in accordance with the National Environmental Policy Act (NEPA) and related environmental and economic documentation requirements.

The Contractor shall complete an analysis of all reasonable alternatives that may include structural or non-structural measures for the dam site. Structural rehabilitation alternative shall be to be in compliance with NRCS and North Carolina Dam Safety criteria and performance standards for the appropriate hazard potential. Alternatives requiring analysis include, but are not limited to, the following:

- NEPA No Action (PR&G Future Without Federal Investment (FWOFI)),
- Decommissioning (developed to meet the purpose and need, usually combination of removal with relocations or floodproofing, etc.),
- Structural Rehabilitation,
- Sponsor's Alternative, and
- National Economic Efficiency (NEE) alternative under Economic and Environmental Principles, Requirements and Guidelines for Water and Related Land Resources Implementation Studies (PR&G).

The Preferred Alternative will be identified from the alternatives studied in detail.

The Contractor shall furnish all personnel, equipment, labor, materials, transportation, facilities other incidentals as required to perform the services described herein.

This work includes providing services as required to accomplish the development of all phases of the project from collection and analysis of information, formulation and evaluation of alternatives, and preparation of a Plan-Environmental Document until accepted by the NRCS as described in this POW. All engineering work will be performed under direct supervision of a registered Professional Engineer licensed in the state of North Carolina, who will affix his/her Professional Engineering stamp (seal) on all engineering drawings, documents and certifications.

B. DEFINITIONS

1. “Contractor” refers to the Architecture/Engineering firm or other entity selected or contracted to perform the work defined in the POW through work orders, agreements or other contracting methods.

2. “Project Manager” (PM) refers to the individual designated as the point of contact for the Contractor selected to perform the work defined in the POW through work orders, agreements or other contracting methods. All decisions and communication will be coordinated through the respective PM.

3. "Contracting Officer" (CO) is the individual with the NRCS authority to enter into, administer and/or terminate contracts and make related determinations and findings for the entity awarding the contract.

4. "Contracting Officer's Representative" (COR) is the individual assigned to this project by the CO to assist in the technical monitoring or administration of this project. The COR provides technical review of the work submitted by the Contractor and advises the CO as to the technical suitability of required deliverables.

5. “Quality Assurance/ Quality Control (QA/QC) Plan” refers to activities performed by the Contractor to ensure and document that the work performed have been properly developed and meet the minimum requirements of the contract. It is the Contractor’s responsibility to have a detailed and functional QA/QC Plan.

C. DESCRIPTION OF THE PROJECT SITE

Deep Creek Dam # 19A is located in Yadkin County, latitude 36.157382º, longitude -80.726944º. Deep Creek Dam # 19A was constructed in 1961 under Public Law 83-566 as a low hazard potential structure. Deep Creek Dam #19A is currently classified as a high hazard potential dam and was determined to be out of compliance with current NRCS and North Carolina dam safety criteria and

performance standards. The design service life of Dam #19A is 50 years. The dam has two auxiliary spillways for the structure.

Deep Creek Dam # 21 is located in Yadkin County, latitude 36.092550º, longitude -80.720725º. Deep Creek Dam # 21 was constructed in 1963 under Public Law 83-566 as a low hazard potential structure. Deep Creek Dam #21 is currently classified as a high hazard potential dam and was determined to be out of compliance with current NRCS and North Carolina dam safety criteria and performance standards. The design service life of Dam #21 is 50 years.

Black and Veatch Corporation completed a Dam Assessment Report on Deep Creek Dam # 19A on April 15, 2011. Schnabel Engineering completed a Dam Assessment Report on Deep Creek Dam #21 on September 1, 2016. No modifications have been completed on the structures.

D. AVAILABLE INFORMATION

The following information is available and will be will be provided to the Contractor within fourteen (14) calendar days of the date NRCS signs the agreement.

1. Dam Assessment Reports - Deep Creek Dam # 19A and 21.
2. As-built drawings and design folders.
3. Engineering Files and Reports.
4. Geologic Investigation Report.
5. Original and supplemental Watershed Work Plans.
6. Operation and Maintenance (O&M) Agreement and Plan.
7. Soil Mechanics Report Tests and Reports.
8. The past five (5) years of inspection reports.
9. National Inventory of Dams (NID) data.
10. Contact information for the Sponsor and NRCS local field office.
11. Spreadsheet titled “Evaluation of Potential Rehabilitation Projects.”
12. Spreadsheet titled “PAR Computation Worksheet.” (Dam Assessment)
13. Spreadsheet “Rehab Cost Computation.”

Any other existing information or existing materials that may be available from NRCS and deemed by the Contractor as necessary for completing this work must be requested in writing to the CO.

E. SCOPE OF WORK

The work consists of the performance of any part or all inventories, surveys, investigations, preliminary designs, meetings, coordination, and planning necessary

to complete an acceptable NRCS supplemental watershed Plan-Environmental Document.

All work performed for this POW will conform to NRCS regulations, policy, conservation practice standards, criteria and technical guidelines, and the Watershed Protection and Flood Prevention Act of 1954 (Public Law 83-566) as amended by the Small Watershed Rehabilitation Amendments of 2000 (Section 313 of Public Law 106-472).

The Plan–Environmental Document shall follow the policy outlined in DR 9500-013*, Conducting Analyses Under the Principles, Requirements, and Guidelines for Water and Land Related Resources Implementation Studies and Federal Water Resource Investments*, and other requirements set forth in the Council on Environmental Quality (CEQ) *Principles Requirements and Guidelines for Federal Investments in Water Resources* (PR&G), and *Interagency Guidelines* (IAG); and other PR&G guidance as developed through agency training or policy updates. The Plan–Environmental Document will meet all requirements set forth by the NEPA, Endangered Species Act and the National Historic Preservation Act.

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 in Sections 501.32 through 501.45.

NRCS Policy documents include, but are not limited, to the following:

- Title 180 Part 500 National Operations and Maintenance Manual (NOMM)
- Title 190, Part 410, General Manual (GM)
- Title 210 Part 500 National Engineering Manual (NEM)
- Title 390 Part 500 National Watershed Program Manual (NWPM)
- Title 400 General Manual (GM), Part 400 - Public Participation Policy.
- Economic and Environmental Principles, Requirements and Guidelines for Water and Related Land Resources Implementation Studies (PR&G).
- Department Manual 9500-013 for PR&G.

NRCS Technical Materials include but are not limited, to the following:

- Title 180 Part 600 National Planning Procedures Handbook (NPPH)
- Title 190 Part 610 National Environmental Compliance Handbook (NECH)
- Title 190 Part 601 National Cultural Resources Procedures Handbook (NCRPH)
- Title 200 National Resource Economics Handbook Part 611 Water Resources
- Title 200 Economics Technical Notes (TR)
- Title 210 Engineering Technical Releases (TR)

- Title 210 Engineering Technical Notes (TN)
- Title 210 National Engineering Handbooks (NEH)
- Title 450 National Handbook of Conservation Practices (NHCP)
- Title 390 Part 600 National Watershed Program Handbook (NWPH)

NRCS policy and technical materials can be accessed from the NRCS eDirectives website http://directives.sc.egov.usda.gov/ .

Engineering surveys, engineering hydrologic and hydraulic analyses and geologic activities must be performed in accordance with NRCS and the North Carolina Dam Safety standards.

If during project planning additional analyses, evaluations, environmental compliance activities, and documentation are needed that are beyond the requirement detailed in this POW, NRCS, in consultation with the Contractor and other affected parties, will determine the need and extent of the work. If it is decided the additional work is needed, NRCS will determine the avenue by which additional work will be completed. If funding is available, NRCS will acquire the needed work by negotiating with the current Contractor or utilizing another Contractor, Sponsor resources or NRCS staff.

F. PERSONNEL

1. The Contractor shall designate in writing to the Contracting Officer (CO) a principal member of the Contractor's Team who will serve as the Project Manager (PM) for the project and responsible for supervising the work. Contractor's PM shall be fully cognizant of the contract requirements, performance of the work, and schedule requirements.

2. Contractor will provide all project management and coordination necessary for completion of all activities outlined in this POW. Contractor will also monitor labor utilization, project schedule, and project budget on a regular basis. Contractor's PM will be responsible for ensuring that the project budget is being strictly adhered to and that deliverables are submitted in accordance with the approved performance schedule. Contractor's PM will be fully responsible for performance of Contractor's personnel, including sub-consultants. Contractor's PM will provide progress reports as described in Section I.

3. The Contractor shall submit for the CO's approval the names and qualifications of all personnel who will be supervising and performing work on this contract. The work detailed by this POW shall be performed by the personnel who have been approved by the CO to perform the work. Less experienced and/or less qualified personnel shall not be utilized for the performance of this contract unless approved in advance by the CO. The required information shall be submitted within thirty (30) calendar days of the issuance of the Notice-To-Proceed (NTP).

4. The employees designated by the Contractor shall serve in these capacities throughout the life of the project. If an assigned employee must be replaced by the Contractor, the replacement candidate must have the same or greater qualifications as the original employee. The Contractor shall submit documents supporting the replacement candidate's qualifications. The CO will have fourteen (14) calendar days after submission of all documentation to evaluate and approve or disapprove the replacement candidate.

5. The Contractor shall submit for the CO's approval the names and qualifications of all subcontractors who will be performing work on this contract. If an assigned subcontractor must be replaced by the Contractor, the replacement candidate must have the same or greater qualifications as the original subcontractor. The Contractor shall submit documents supporting the replacement subcontractor's qualifications. The CO will have fourteen (14) calendar days after submission of all documentation to evaluate and approve or disapprove the replacement subcontractor.

6. All work must be conducted by experienced interdisciplinary staff under the direct supervision of a Professional Engineer currently licensed in the State of North Carolina and recognized as an Engineer of Record by the North Carolina Dam Safety Program.

G. TASKS AND DELIVERABLES

For the purpose of contract administration and payments, the work is divided into four (4) Principal Phases of work described below as Phase I, II, III, and IV. Required items and subsidiary items, details, and deliverables for each Principal Phase are described in Attachment 1 - *Technical Specifications - Planning Services for Supplemental Watershed Rehabilitation Plan-Environmental Document* and in Attachment 2 - *Requirements and Technical Specifications for Geologic and Geotechnical Investigations*.

Due dates and a project schedule are provided in Attachment 4 – Schedule of Work and Timeline. The Plan- Environmental Document shall follow the policy outlined in DR 9500-013*, Conducting Analyses Under the Principles, Requirements, and Guidelines for Water and Land Related Resources Implementation Studies and Federal Water Resource Investments*, and other requirements set forth in the Council on Environmental Quality (CEQ) *Principles Requirements and Guidelines for Federal Investments in Water Resources* (P&G), and *Interagency Guidelines* (IAG); and other PR&G guidance as developed through agency training or policy updates.

1. Phase I—Identify Problems and Determine Objectives. — This Phase includes determining Sponsor objectives and the purpose and need for the project, performing inspections and topographic surveys as needed to evaluate the dam and conduct hydrologic and hydraulic (H&H) analysis and determining sediment life; performing H&H analyses to determine flood

prevention/protection needs, to evaluate the dam and to formulate and evaluate alternatives; identifying resource problems and opportunities; identifying social issues; and performing any necessary geological and geotechnical investigations to evaluate alternatives for comparison.

Phase I also includes the scoping, interagency consultation, and the development and implementation of a Public Participation Plan (PPP) in conformance with Title 400 General Manual Part 400 (see Exhibit 3 for example) and implementation of the PPP. Public participation activities will be conducted according to the approved PPP. Public participation work may include, but not limited to the following activities: assistance with any public meeting for initial public meeting, Draft and Final Plan-Environmental Document, transcription of the meetings, any Government to Government consultations or Environmental Justice public participation activities.

See Attachments A and B for details of Phase I requirements and deliverables.

2. Phase II—Inventory Resources and Analyze Resource Data.— This phase includes inventorying relevant, and as appropriate, watershed resources for environmental, economic and social (e.g. air quality, water quality, threatened and endangered species, wetlands, etc.) resource concerns and conducting environmental evaluations. This information will provide the basis for forecasting project effects.

3. Phase III—Alternative Formulation Evaluation and Decision. — This Phase includes formulation and development of all reasonable alternatives including performing H&H analyses to determine upstream and downstream flood impacts and impacts to currently effective floodplain zoning, evaluation and comparison of the ecological, cultural, economic and social effects of alternatives, cost estimates, and development of a NEE alternative (required for water resource projects and must be evaluated according to PR&G (2013) and DM 9500-013 completed in 2017).

   The preferred alternative will be identified as the reasonable alternative that maximizes net public benefits to society.

   Public participation activities for Phase III will be conducted according to the approved PPP.

   See Attachment A for details of Phase III requirements and deliverables.

3. Phase IV—Preparation of Watershed Plan-Environmental Document. — This Phase includes development of the Preliminary, Draft and Final Plan-Environmental Document for technical review by NRCS-North Carolina, NRCS National Water Management Center (review Preliminary copy only), Sponsor, and others directly involved in the planning of the project.

See Attachment A for details of Phase IV requirements and deliverables.

H. QUALITY OF WORK

Contractor will follow his/her Quality Assurance/Quality Control Plan (QA/QC) for the Project. A copy of the Contractor's QA/QC Plan will be submitted to NRCS at the Project Kick-Off Meeting. The Contractor's QA/QC officer will be charged with responsibility of the Plan's implementation and documentation of current QA/QC activities. An update on all QA/QC activities will be reported in the progress reports. All work performed by the Contractor's personnel, including sub-consultants, will be in accordance with the Contractor's QA/QC Plan.

All submittals, including memoranda, reports and studies, will undergo quality management reviews in accordance with the Contractor's documented QA/QC processes for the Project. The purpose of the QC review is to verify that the resulting work products meets acceptable practice standards and that the documents have been properly coordinated to the satisfaction of the NRCS. The QC reviewer will inform the Project team of any exception or proposed improvement that may be noted. QC reviews will be provided for all submittals. The QC reviews will be conducted prior to submittal to allow time for incorporation of any recommended revisions.

Deliverables and submittals will meet the following criteria:

1. All work will be performed in a professional manner in accordance with all policy, rules, laws, technical criteria, and procedures reference in this POW.

2. Text material of reports and design memorandums and computation sheets will be prepared on standard letter size sheets (8-inches by 11-inches). Fonts will be 12-pt Times New Roman and paragraph format will be single space. Reports will be prepared in Microsoft Office 2016 for personal computers. Drawings, graphs, photos, etc., for reports and memoranda that are required to be bound will have a binding edge 11 inches in length.

3. All maps that are geo-referenced will use NAD 1983 State Plane North Carolina (US Feet) (FIPS 3200) coordinate system. Any maps created in ArcGIS, when submitted to NRCS in electronic files, will include all shape files and all associated accessory files such as .dbf, .prj, .shp, and .shx files.

4. All field notes, computations, drawings, maps, sketches, and other data will be complete, recorded neatly, checked by persons as equally qualified as those performing the original computations, and organized in a manner that will allow reproduction of copies and incorporation in reports with a minimum of editing and revision.

5. Drawings, diagrams, graphs, sketches or other pictorial representations will be physically incorporated into the planning file whenever the size and scale are appropriate. Drawings that must be drawn on larger-sized sheets and cannot be

folded to computation sheet size will be cited at the appropriate place in the computations by a notation that fully identifies the drawing and its file location.

6. The input files and output files of computer programs used in planning will be provided in hard copy and electronic format. The files will be fully documented and presented to the COR.

I. REVIEWS

1. The Contractor shall schedule reviews with the COR on the Initial, Preliminary, Draft, and Final Plan-Environmental Document.

2. The Plan-Environmental Documents will be reviewed and verified for accuracy and conformance to NRCS policy by Contractor's personnel prior to submittal to the COR.

3. NRCS will review and determine if the Plan-Environmental Documents are technically acceptable and return comments to Contractor within thirty (30) calendar days of the submittal. During NRCS' review, Contractor will respond to questions and provide clarification to NRCS' comments. If requested, Contractor and Contractor's key technical staff be available at designated times during the review period to respond to questions from NRCS, either in person, by phone, and/or email.

4. Work, that in the opinion of the CO does not require conference discussions, may be reviewed and approved by correspondence. Where conferences are required, the Contractor shall notify the CO at least seven (7) days in advance of the time of each conference and shall provide, at the time of such notification, an agenda of the questions to be considered. The Contractor shall prepare minutes of the conference and decisions reached. Minutes of the conference shall be submitted to the COR within seven (7) calendar days after the review conference.

H. MEETINGS AND CONFERENCES

Meetings and conferences are as described below. Meetings will be in-person at the Yadkin Soil and Water Conservation Field Office in Yadkinville, North Carolina unless otherwise stated here, or other locations agreed to by the CO and Contractor. Conferences may be in-person, teleconferences, or web meetings, based on the content needed to be shared/discussed.

The Contractor is responsible for making arrangements and announcements for such meetings and conferences, in consultation with the COR.

The Contractor shall prepare minutes of all meetings and conferences summarizing discussions, decisions reached, and action items determined. Contractor shall provide a copy of the minutes to the COR within seven (7) calendar days of the meeting.

Work that, in the opinion of the CO in consultation with the COR, that does not require meetings or conferences may be reviewed and concurred by NRCS in writing (email, mail, or fax).

Meetings

1. There will be four (4) internal meetings between the Contractor and NRCS during the course of the work detailed in this POW. Meetings will be initiated by the Contractor in accordance with the specified time frames listed below.

   Meeting dates will be coordinated with NRCS. The Contractor shall notify the CO of the date, time and location of the meeting at least fourteen (14) calendar days in advance of each meeting. The Contractor shall provide a draft agenda, any draft presentations, and/or other materials to NRCS for review seven (7) calendar days in advance of each meeting.

   a. Project Kick-Off –The meeting will be used to get acquainted, discuss the details of the contract, review examples and guidance, develop a mutual understanding regarding the scope of work, become familiar with the personnel to be involved, discuss day-to-day working arrangements and discuss any items of concern. It will be held at a location and time convenient for the Contractor and NRCS.

   b. Phase I Completion – The meeting shall be held prior to completion of the Phase 1. The purpose of the meeting is to review project status and discuss any issues, problems and opportunities identified during the inventory and analysis. This meeting can be an in-person meeting or teleconference at the discretion of NRCS.

   c. Alternatives – The meeting shall be held prior to completion of Phase II. The Contractor will present an update on the project status and a comparison of the effects on the alternatives considered. This meeting will be held at a location and time convenient for the Contractor and NRCS.

   d. Final Plan-Environmental Document Review – The Contractor will present the following information:

      (i) Final Plan-Environmental Document.

      (ii) Documentation as required by the contract.

2. The Contractor will attend three (3) external meetings during the course of the work detailed in this POW. The meetings will be initiated by the CO with NRCS in attendance. Issues identified in the first two internal meetings will be considered in the development of the Alternatives in Phase II. All of the meetings will be held at Yadkin Soil and Water Conservation Field Office in Yadkinville, North Carolina. NRCS will take notes and provide them to the Contractor within 10 calendar days of the meetings. The Contractor will consider the identified public concerns throughout the entire process.

a. Public/agency scoping – This meeting will be held early during Phase I. No presentation from the Contractor is required.

b. Initial public meeting – This meeting will typically be held during the evening of the same day as the public/agency scoping meeting.

c. Near the end of Phase II – The Contractor will present the evaluated alternatives for discussion. The recommended alternative will also be presented.

Conferences

1. Project Update Conferences – These conferences will be held monthly for the Contractor to keep the COR and CO informed on the progress of completing project Phases and subsidiary items. Draft agendas, presentations, and materials shall be submitted to the CO at least seven (7) calendar days prior to conferences. These meetings may be held in the NRCS State Office, or other location approved by NRCS. These meetings may be in-person, net meetings, or teleconferences at the discretion of NRCS.

2. "As-needed" – These conferences will be held whenever requested by the CO, COR, or Contractor to discuss issues relating to the project, work previously performed will be reviewed, and decisions made with a view toward expediting the completion of the contract. These meetings may be held in the NRCS State Office, or other location approved by NRCS. These meetings may be in-person, net meetings, or teleconferences. The Contractor is responsible for making arrangements and announcements for such meetings.

3. Public Scoping – These conferences will be held prior to the public scoping process. The purpose of the meeting is to review project status, agree on details of the scoping process, materials and types of information to be shared and acquired.

4. Geologic Investigation – The contractor will participate in a conference with the NRCS State Conservation Engineer, Contracting Official Representative (COR)/Contracting Officer (CO), NRCS Regional Geologist, and other appropriate NRCS staff, will be held as prior to the start of any geological investigation to discuss the geological investigation plan. This conference may be held via teleconference or web meeting, or site walk-through if requested in advance.

5. Plan-Environmental Document Review – These conferences will be held upon NRCS and Sponsor reviews of the Initial, Preliminary, Draft, and Final Plan-Environmental Document.

I. PROGRESS REPORTS

Contractor will submit a progress report to NRCS by email by close of business on the last Friday of each month. The progress report shall include, but not be limited to, the following:

a. activities accomplished during the previous month,

b. any problems, issues, or concerns encountered in the development of the Supplemental Watershed Plan-Environmental Document, and

c. planned actions for the next month.

J. SUPPORTING DATA

All notes, computations, design assumptions, drawings, sketches, and other data shall be checked and initialed by a competent person. This information shall be recorded neatly and organized in a manner that will allow reproduction of copies and incorporation in reports with a minimum of editing and revision. Data will be sorted by discipline and indexed. All text documents, spreadsheets, etc., shall be developed using Microsoft Office programs including 2016 Microsoft Word and 2016 Microsoft Excel. All documents will be transmitted to the NRCS in a readable and writeable digital format.

The NRCS acknowledges that the supporting data and documentation generated by the Contractor are instruments of professional service. However, all documents, including resource inventory data; survey data; engineering, hydraulic, hydrologic, and economic model outputs; geology investigation reports; drawings; maps; estimates; and all other data used in the preparation of the Plan-Environmental Document are the property of NRCS and are to be provided to NRCS upon request.

K. MEASUREMENT AND PAYMENT

1. All phases have subsidiary items that will be used to identify payment increments. The Contractor will submit a firm fixed price for each of the subsidiary items of work identified in Phases I through III. The Contractor will also provide the following information to support their firm fixed price:
   a. Detailed listing of personnel position (*e.g.* Engineer VI, etc.) and hours worked for each phase and subsidiary item.
   b. Detailed listing of direct costs, in addition to labor costs, associated with each phase.

2. The Contractor will submit invoices for payment for an item of work after all the work for that item is completed. All required certifications for the item will be submitted along with the invoice. A detailed breakdown of personnel time and direct costs will not be required for the invoice.

3. Payment will be made for the firm fixed price for an item only after the item is completed and required certifications are provided and approved. Payments will be prorated as defined in the contract payment schedule. Such payments will constitute full compensation for all labor, equipment, tools, supplies and all other items necessary and incidental to the completion of the work including plotting, drafting, printing and reproduction services of the specified number of copies.

L. PERFORMANCE TIME

1. The performance time for the project is seven hundred-thirty (730) calendar days from the issuance of the NTP. This performance time includes all planning services, meetings, conferences, and reviews. Time frames for individual milestones are shown on Attachement 4.

2. The Contractor shall complete items for each Phase and subsidiary items according to the times shown in Attachment 4. NRCS will have forty-five (45) calendar days from the day of receipt to review the Initial, Preliminary, Draft, and Final Plan-Environmental Document . Additional time for review of resubmittals may be necessary if unresolved issues arise during the review period.

3. It is acceptable and preferred for the Contractor to complete individual deliverable items early to reduce review times and revisions of subsequent work.

4. Contractor's request to change the project schedule must be submitted in writing (e-mail, fax, mail) to the CO with a justification for the change. The CO will notify the Contractor within fourteen (14) calendar days of the decision whether the requested change to the project is approved.

5. It may be possible to work on several subsidiary items concurrently. Generally, all critical items in each Phase should be completed and concurred with by NRCS before starting the next Phase. The Contractor will coordinate with the COR to ensure the project progresses on schedule while avoiding starting subsidiary items that may depend on data or decisions from a prior Phase.

6. Start and finish dates shall adhere to the overall performance time stated in this POW and shown in Attachment 4.

M. TERMINATION CLAUSE

The contract may be terminated for failure to successfully complete items in the Task Order or adhere to project schedules.

N. LIST OF ATTACHMENTS

Attachment 1 – Technical Specifications - Planning Services for Supplemental Watershed Rehabilitation Plan-Environmental Document

Attachment 2 – Attachment 2 - Requirements and Technical Specifications for Geologic and Geotechnical Investigations

Attachment 3 – Public Participation Plan

Attachment 4 - Schedule of Work and Timeline

Attachment 1 - Technical Specifications - Planning Services for Supplemental Watershed Rehabilitation Plan-Environmental Document

A. GENERAL

This Technical Specification describes the details and requirements of the Phases and subsidiary items described in the plan of work (POW). Requirements for geologic and geotechnical investigations are described in Attachment 2 - *Requirements and Technical Specifications for Geologic and Geotechnical Investigations.*

Deliverable items for each Phase and subsidiary items are due according to Attachment 4 - *Schedule of Work and Timeline*.

Engineering surveys, engineering hydrologic and hydraulic analyses, and geologic activities must be performed in accordance with NRCS-North Carolina, North Carolina , dam safety, and OSHA standards. The Contractor must certify that all surveys and analyses meet the required criteria.

All activities shall comply with the Watershed Protection and Flood Prevention Act of 1954 (Public Law 83-566) as amended by the Small Watershed Rehabilitation Amendments of 2000 (Section 313 of Public Law 106-472).

All modeling and mapping shall use North Carolina State Plane NAD83 datum US feet horizontal coordinates and NAVD88 US feet vertical datum. All map sheets and tables showing real world elevations shall include the datum and coordinate system used. All models shall make note of the elevation datum used in the mode descriptions. All existing elevations used in this analysis having the NGVD29 datum shall be converted to NAVD88. *(Note: Most regulatory flood Insurance Rate Maps (FIRMs) now use NAVD88 so unless the currently effective FIRMs are referenced to vertical datum NGVD29 all elevations should be referenced to NAVD88 and elevations from project records and as-built drawings shall be converted to NAVD88.)*

The deliverable items for each Phase and subsidiary items may be portions of the Plan-Environmental Document or stand-alone items as part of the Project Folder as described. For Phases II and III deliverables that are portions of the Plan-Environmental Document, draft versions shall be submitted for NRCS-North Carolina for review and comment.

B. REFERENCE MATERIALS

The following is a list of potential NRCS reference materials that may be required for prosecution of the work. Most of these reference materials are available on the NRCS Website. The address for these documents is: https://directives.sc.egov.usda.gov/ . The CO will furnish the NRCS reference materials not available on the NRCS Website upon request from the Contractor. Non-NRCS documents will be obtained by the Contractor.

1. Title 390, Part 500 NRCS National Watershed Program Manual (NWPM)

2. Title 210, Part 500 NRCS National Engineering Manual (NEM)
3. Title 180 Part 500 NRCS National Operations and Maintenance Manual (NOMM)
4. Title 180 Part 600 NRCS National Planning Procedures Handbook (NPPH)
5. Title 190, Part 410, Section 410.25 2General Manual (GM)
6. Title 390, Part 600 NRCS National Watershed Program Handbook (NWPH)
7. Title 200 NRCS National Resource Economics Handbook Parts 610, 611 and 612
8. Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies U.S. Water Resources Council. Washington, D.C. March 10, 1983
9. Principles, Requirements, and Guidelines for Water and Land Related Resources Implementation Studies and Federal Water Resource Investments, Council of Environmental Quality, Washington, D.C. March 2013
10. Title 190 Part 610 National Environmental Compliance Handbook (NECH)
11. Title 190 Part 601 National Cultural Resources Procedures Handbook (NCRH)
12. Title 210 NRCS National Engineering Handbook (NEH), Parts 624, 628, 630, 631, 633, 636, 637, 641, 642, 650, 651, 653 and 654; Sections 3, 5, 6, 8, 11, 14, 15 and 16
13. NRCS Technical Releases (TR):

TR 5	Structural Design of Underground Conduits
TR 17	Geologic Investigation for Watershed Planning
TR 18	Computation of Joint Extensibility Requirements
TR 25	Design of Open Channels
TR 25A	Design of Open Channels, Appendix A, Stream Armor Design Concepts
TR 29	Hydraulics of Two-Way Covered Risers
TR 30	Structural Design of Standard Covered Risers
TR 31	Structural Analysis and Design at Low Stage Inlets
TR 33	Simplified Method for Determining Floodwater Storage
TR 35	Method of Reservoir Flood Routing
TR 37	Structural Analysis and Design at Base of Riser with Conduit Openings in Both Endwalls
TR 39	Hydraulics of Broad-Crested Spillways
TR 47	Classification System for Varied Flow in Prismatic Channels

TR 48	SITES Water Resource Site Analysis Computer Program User's Guide
TR 49	Impact Basins Associated with Full Flow in Pipe Conduits
TR 50	Design of Rectangular Structural Channels
TR 54	Structural Design of SAF Stilling Basins
TR 54-1	Structural Design of SAF Stilling Basins, revised wingwall design, Amendment 1
TR 55	Urban Hydrology for Small Watersheds
TR 56	A Guide for Design & Layout of Vegetative Wave Protection for Earth Dam Embankments
TR 57	Flood Proofing
TR 59	Hydraulic Design of Riprap Gradient Control Structures
TR 59-1	Graphical Solution for the Hydraulic Design of Riprap Gradient Control Structures, Amendment 1
TR 59-2	Water Surface Profiles and Tractive Stresses for Riprap Grade Control Structures, Supplement 1
TR 59-3	Water Surface Profiles and Tractive Stresses for Riprap Grade Control Structures, Revised Pages, Supplement 2
TR 60	Earth Dams and Reservoirs
TR 62	Engineering Layout, Notes, Staking and Calculations
TR 63	Structural Design of Monolithic Straight Drop Structures
TR 65	Procedures to Establish Priorities in Landscape Architecture
TR 66	Simplified Dam-Breach Routing Procedure
TR 67	Reinforced Concrete Strength Design
TR 68	Seismic Analysis of Risers
TR 69	Riprap for Slope Protection Against Wave Action
TR 70	Hydraulic Proportioning of Two-Way Covered Baffle Inlet Riser
TR 74	Lateral Earth Pressures
TR 75	Reservoir Storage Volume Planning
TR 78	The Characterization of Rock for Hydraulic Erodibility

11. Hydrologic and Hydraulic Computer Models (use most current version): Hydrology: NRCS-Win TR20; NRCS-Win TR55; NRCS-SITES; HEC HMS Stream Hydraulics; US Army Corps of Engineers-HEC RAS Dam Breach Analysis; US Army Corps of Engineers-HEC1; NRCS TR 60; NRCS TR 66
12. NRCS Technical Notes (TN): Design Notes 6, 8, and 24

13. NRCS National Bulletin 190-13-11, Release of Revised Form CPA-52, "Environmental Evaluation Worksheet"

C. QUALITY OF WORK

Contractor will follow his/her Quality Assurance/Quality Control Plan (QA/QC) for the Project. Quality of work will be as described in this POW.

D. REVIEWS AND APPROVALS

Review and approval of submittals will be as described in the POW for this project.

E. DESCRIPTION OF WORK:

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 sponsor objectives and assisting the NRCS staff to determine, in consultation with the sponsors, 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:

1. A need to relieve a dam safety concern resulting from the dam, originally constructed as a low hazard dam, not meeting NRCS and North Carolina dam safety criteria and performance standards for its current high-hazard classification.
2. A need to continue flood prevention, currently provided by the dam's ability to attenuate peak flood flows, to a level to be determined in this phase of the work.

B. Subsidiary Items:

1. <u>Evaluate Existing Site Conditions Including</u>

a. Perform a record search of files of the NRCS, sponsor, North Carolina Dam Safety Office, 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) original watershed plan and applicable supplements,

(iii) hydrologic and hydraulic files, design files, geology and geotechnical files,

(iv) operation and maintenance agreement, inspection reports, and reports of remedial actions

(v) dam operation permit issued by the State

(vi) copies of deeds and easements,

(vii) project records and hydraulic models for potentially impacted bridges and culverts

(viii) 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.

(ix) 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 dam site in accordance with NRCS-North Carolina formal dam inspection procedures including all areas of embankment and non-earthen components including the principal spillway riser, gates, trash rack, conduit, and outlet structure.

c. Perform and record a closed caption television (CCTV) inspection of the principal spillway conduit and a narrative report with photographs.

d. Locate and determine elevations of established benchmarks on or near the dam site and perform a topographic survey of the site from which profiles and cross sections of the embankment and auxiliary spillway can be derived as well as key elevations of spillway components for evaluation of settlement or other adverse movements and for hydraulic and other engineering analyses work. Also obtain typical stream 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 are included in Attachment 2 and are part of that phase of work. For all surveys horizontal coordinates will reference the State Plane US Feet NAD83 datum with a current reference frame. Corrections shall be made using either post processing of

the base points in OPUS or by surveying NGS or North Carolina GS benchmarks. Note that North Carolina GS horizontal control in COR96 will need to be updated to a more modern reference frame. The reference frame and geoid used, and correction method shall be documented in the project folder. All elevation data shall be reported using the NAVD 88 US Feet and Geoid 2012A or newer datum. Elevations reported from project records shall be converted to the NAVD 88 datum. Any omission, discrepancies or inadequacies in data furnished as a basis for surveys shall be reported promptly. Should the need for supplementary data become apparent during the development of the surveys, the Contractor shall promptly report such needs. Such reports shall contain suggestions for corrective actions required to secure adequate data.

e. Obtain elevations of the lowest adjacent grade of homes, roads, water sources, utilities, burial sites, and historical sites upstream of the dam that would be expected to be inundated by a probable maximum precipitation (PMP) event. 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 dam that may be in the flowage area of the auxiliary spillway (areas where it is anticipated the water surface profile for the dam in-place condition is higher than for the dam 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 dam. Consultation with the NRCS State Geologist is required throughout this work item.

g. Prepare a topographic map of the dam site and reservoir. 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-dam elevation or 5 feet above the maximum reservoir elevation during a probable maximum precipitation event, whichever is lower.

h. Deliverable items include a narrative report of dam inspection and CCTV inspection with photographs and plotted cross sections and profiles, a video recording of the principal spillway, a narrative report describing the methods, assumptions, calculations and results of the sediment survey that may later be used to draft required information for the Affected Environment section and for the Investigation and

Analysis Report (Appendix D) of the Plan-Environmental Document, and a topographic map of the surveyed dam site and reservoir area including bathymetric data obtained during the sediment survey, and text files of all surveyed points. The maps shall be delivered as part of the project folder as paper drawings and pdf files at a scale appropriate for 11" x 17" exhibits in the Plan-Environmental Document, as well as AutoCAD drawings in dwg format including all points, surfaces and externally referenced files.

2. Perform geologic and geotechnical investigations including:
   a. Investigations, soils laboratory testing, and furnishing a geologic and geotechnical report for areas as defined in Attachment 2.
   b. In consultation with the North Carolina-NRCS State Geologist determine geologic parameters required by the NRCS SITES computer program for determination of stability and integrity of the auxiliary spillway.
   c. In consultation with the North Carolina-NRCS State Geologist determine the stability of the dam embankment in accordance with TR-60 and other applicable NRCS requirements.
   d. Evaluate the feasibility of using previously identified borrow areas as possible sources of material for structural rehabilitation alternatives using existing geology reports and as-built drawings and quantity information.
   e. Details, specific requirements, and deliverables for this subsidiary item are described in Attachment 2.
3. Perform general data collection for hydrologic analyses including:
   a. Delineate drainage area of dam based on best available mapping/LiDAR data including any necessary field inspections.
   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 dam's 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 dam) may be based upon the most recent land-use / land-cover mapping available from North Carolina or other sources approved by the COR 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 51 and 52.

e. Compute times of concentration (Tc) for existing and future conditions for sub-basins upstream of the dam and for major tributaries downstream of the dam, 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 dam.

f. Revise existing stage-area/storage ratings as necessary based on sediment survey results using the updated floodwater-retarding capacity and accounting for future end of life (50- to 100-years) aerated sediment. Use the NRCS SITES program to determine Stage-discharge ratings for standard covered risers 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. Dam 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 Contractor. Inundation areas will be mapped downstream to where dam 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 dam 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 dam 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 dam. 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 dam 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 dam. 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 dam. 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 dam, whichever is higher.

(iii) Seismic breaches will be computed by routing a breach hydrograph downstream beginning just downstream of the dam. 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 dam.

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 dam 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 dams shall be classified according to North Carolina Dam Safety 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 rehabilitation alternative involves a major change that would increase or decrease the population at risk it will likely not be necessary to perform additional dam 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 Dam

   a. This activity includes performing hydrologic and hydraulic (H&H) analyses to evaluate the sizing and proportioning of the dam embankment and spillways and the stability and integrity of the existing auxiliary spillway for the current hazard classification in accordance with the criteria contained in TR-60 and in accordance with the State of North Carolina including special considerations for dams in series if applicable.

   b. H&H analyses will be conducted using the NRCS SITES computer program which is especially suited for evaluating NRCS-assisted dams for compliance with TR-60 and other NRCS guidance.

   c. 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:

   This activity includes routing floods to determine flood impacts upstream and downstream for the purpose of informing the NRCS, Sponsors, 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 dam and

evaluating agricultural flood damages for the existing-dam condition, the dam 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 dam non-existent condition.

b. Routing steady 24-hour-duration 10-, 25-, 50-, 100-, 200- and 500-year recurrence-interval floods downstream of the dam and evaluating urban flood damages for the existing-dam condition, the dam 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 dam 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 dam and rehabilitated dam alternatives will use the NRCS SITES 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-North Carolina, FEMA, North Carolina Department of Transportation, NC OneMap GeoSpatial Portal, Flood Risk Information System (FRIS), the Town of Yadkinville, 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 dam, 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 sponsors, local jurisdictions, 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 in Appendix D of that document. 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 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. The Contractor shall 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 State Dam Safety Official, the State Department of Transportation, and affected local floodplain zoning administrators. Public meetings will be coordinated with the Sponsor 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 Contractor 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 the Sponsor and NRCS. The plan will outline agency, State Historic Preservation Office (SHPO) and Tribal consultations. The Sponsor shall be the official lead for general public participation meetings on the project, but the Contractor is responsible for organizing, managing, and taking minutes of such meetings, with assistance from the Sponsor. The NRCS is the official lead for any NEPA scoping meetings on the Draft or Final Plan-Environmental Document; however, the Contractor will organize, facilitate, and take minutes of such meetings, with assistance from the NRCS.

   c. The PPP Plan must note the inclusion of affected Environmental Justice Communities. The PPP will conform to or be equivalent to

Attachment 3 - Sample Public Participation Plan. Based on the scoping process, there may need to be additional public engagement for any affected Environmental Justice Community or Tribal Government.

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 does not necessarily require on-site sampling of mapped soils.)

   b. Identify wetland types and approximate acres using the Cowardin System for areas upstream and downstream of the dam 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 North Carolina methods and requirements (as applicable) will be utilized. Wetland determinations do not need to be flagged or surveyed in the field for the rehab Plan-Environmental Document. To the extent appropriate, off-site wetland determination methodologies based on aerial photography and other sources will be utilized with limited 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 dam 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 Appendix D 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, the sponsor'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

dams to NRCS and North Carolina Dam Safety criteria and performance standards will be considered. Consideration shall be given to decommissioning the dam 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 (sponsor's) 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 Contractor will document consideration of completeness, effectiveness, efficiency, and acceptability of the alternatives.

b. The Contractor 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 dam 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 (dam) rehabilitation alternatives, may meet the dam 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 dams 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 dam, 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 for Appendix D, 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.

(xi) Complete all required economic and structural tables per the NWPM Section 506, subpart B and NWPH Section 606, Subpart B and NWPH, Subpart B.

(xii) 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.

(xiii) Where applicable and substantially changed from the existing dam condition, a description of the hazard potential of each alternative will be determined and a rationale for the hazard classification documented.

(xiv) 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 Sponsors to determine the Sponsor 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 non-monetary 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-North Carolina, the Sponsors, 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 501.45.

B. Subsidiary Items

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

   a. Prepare initial version of Preliminary Plan-Environmental Document for review by the CO, NRCS-North Carolina, the Sponsors, and others directly involved in planning.

   b. Provide NRCS-North Carolina with two (2) thumb drives, 2 DVDs for the CO, and two DVDs Yadkinville Soil and water Conservation District.

   c. Respond to all NRCS-North Carolina and CO 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 Sponsor's review of the initial version of Preliminary Plan-Environmental Document. Provide two (2) thumb drives to NRCS-North Carolina, two (2) DVD's to the CO and two (2) DVDs to the Sponsors for review and concurrence.

   b. Once concurred by NRCS-North Carolina and the CO, provide NRCS-North Carolina two (2) thumb drive and 6 hard copies. NRCS North Carolina 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 North Carolina upon request.

3. Address NWMC Comments and Concerns

   a. The NWMC will provide draft comments and concerns to NRCS North Carolina. The Contractor will have the opportunity to comment on these draft comments before final NWMC Comments and Concerns are provided to the NRCS. The Contractor must respond, in writing, to each

of the final comments and make required changes in the Plan-Environmental Document. The NWMC comments will be reviewed and addressed by the Contractor.

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 the Contractor will meet to review Contractor's response to the NWMC comments on the Preliminary Plan-Environmental Document. Contractor 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. The contractor will submit two (2) thumb drives to NRCS-North Carolina and 2 DVDs to the CO for review and concurrence.

5. Public Participation

a. The Contractor will 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 in Appendix A of the Plan-Environmental Document (see NWPM 501.45A and NWPH 601.45A).

6. Preparation of Final Plan-Environmental Document

a. NRCS and the Contractor will meet to review comments from the public meeting and resolve the Contractor's 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. The contractor will submit two (2) thumb drives to NRCS-North Carolina and 2 DVDs to the CO for review and concurrence.

7. Identify Expected Permits and Mitigation

a. Contractor will identify and list expected permits required for the rehabilitation project.

b. Contractor 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.

Attachment 2 - Requirements and Technical Specifications for Geologic and Geotechnical Investigations

Deep Creek Watershed - Dam #19A and Dam #21
Yadkin County, North Carolina

A. INTRODUCTION

The work consists of conducting a geologic and geotechnical investigations (GI/SM) for Deep Creek Watershed Dam # 19A and Dam #21. Dam # 19A was constructed in 1961 and Dam #21 was constructed in 1963. Dams 19A and Dam 21 were constructed for flood control, and to reduce the potential for flood damages downstream.

The work consists of conducting a geologic and geotechnical investigation for two (2) existing earthen embankment dam structures and their related components located in Yadkin County, North Carolina.

The geotechnical investigation includes auger drilling, rock coring, testing, sampling, measuring, pressure testing, and grouting. The geotechnical investigation shall be performed at various locations that include the existing auxiliary spillways, potential spillway expansion areas, existing spillway exit areas, top of dams, side slopes of the embankments, and along the downstream toe of the embankments. Rock coring is anticipated in the auxiliary spillways and in the downstream toe areas of the existing structures. Access to the structures and some areas is via unimproved roads. A track-mounted rig is recommended for this work.

All boreholes will be grouted according to specifications and the North Carolina Department of Environment and Natural Resources, Well Construction Standards, Subchapter 2C, Section .0100 upon completion of the work. The qualified drilling sub-contractor acquired by the Contractor shall be capable of mobilizing a drill rig, a driller and drill helper, all equipment, materials and labor necessary to perform the required drilling services. The Contractor shall be responsible for providing fulltime on-site oversight of geologic drilling and sampling operations.

The Contractor is also responsible for contacting Call- Before-You-Dig at 811 North Carolina 811) (1-800-632-4949) at least 3 to 12 working days prior to beginning work.

The Contractor shall provide all required geotechnical and geological services, oversight and quality control of drilling services, selection of a qualified and accredited laboratory facility to perform requisite sample analysis, and special geotechnical analysis services as required.

B. REFERENCE MATERIALS

1. The following is a list of potential NRCS reference materials that are required for prosecution of the work. Most of these reference materials are available on the NRCS Website. The documents can be downloaded from the website

https://directives.sc.egov.usda.gov/ . The CO will furnish the NRCS reference materials not available on the NRCS Website upon request from the Contractor. Non-NRCS documents will be obtained by the Contractor.

a. Title 210-National Engineering Manual (NEM)
   (1) Part 503 - Safety
   (2) Part 531 - Geology
   (3) Part 533 - Geotechnical Engineering

b. Title 210 – National Engineering Handbook (NEH)
   (1) Part 624 - Water Table Control
   (2) Part 628 - Dams
   (3) Part 631 - Geology
   (4) Part 633 - Soil Engineering
   (5) Part 650 - Engineering Field Handbook
   (6) Part 653 - Stream Corridor Restoration: Principle, Processes, and Practices
   (7) Part 654 - Stream Restoration Design

c. NRCS Technical Releases (TR)
   (1) TR-210-17 - Geologic Investigation for Watershed Planning
   (2) TR-210-48 - SITES Water Resource Site Analysis Computer Program User's Guide
   (3) TR-210-60 - Earth Dams and Reservoirs

d. NRCS - Technical Notes (TN) – Title 210 – Engineering
   (1) Geology
      a) TN 210-GN-04 – Photography of Rock Core Samples
      b) TN 210-GN-05 – Soil Sample Size Requirements for Soil Mechanics Laboratory Testing
   (2) Soil Mechanics Notes (SMN)
      a) TN 210-SMN-03 – Soil Mechanics Considerations for Embankment Drains
      b) TN 210-SMN-04 – Preparation and Shipment of Undisturbed Core Samples
      c) TN 210-SMN-13 – Dispersive Clays

e. Dam/Principal & Auxiliary Spillway Evaluation: NRCS-SITES computer program.

f. ASTM International (formerly American Society for Testing and Materials)
   (1) Drilling
      a) ASTM D1586 Standard Penetration Test (SPT)
      b) ASTM D1587 Thin-Walled Tube Sampling
      c) ASTM D2113 Rock Core Drilling
      d) ASTM D6151 Hollow-Stem Augering

(2) Soil Mechanics Testing
   a) ASTM D698 Standard Proctor Test
   b) ASTM D4318 Atterberg Limits
   c) ASTM D4767 and ASTM 7181 Triaxial Shear Test
   d) ASTM D2487 and D2488 Classification of Soils
   e) ASTM D7263 Dry Density
   f) ASTM D7928 Particle Size Gradation with Hydrometer Analysis
   g) ASTM D2435 Consolidation Settlement Testing
   h) ASTM D4221/D6572 Dispersion/Crumb Test

C. PERSONNEL

Personnel used for geotechnical investigations shall be as stated in the plan of work (POW) Item E "Personnel" with the following additional requirements.

1. All geologic work must be conducted by a professional geologist, registered as a Professional Geologist by the State Board of Registration in the State of North Carolina, who will affix his/her Professional Geologist stamp (seal) on all geologic drawings and documents. In the absence of State registration requirements or a State definition of geologist for the practice of geology, the geologist must be certified as a professional geologist by the American Institute of Professional Geologists.

2. All aspects of the field investigation shall be overseen by a professional geologist with experience in geotechnical investigations. This person shall not serve as a member of the drill crew.

D. EQUIPMENT

1. The Contractor must provide a list of all equipment that will likely be used to complete the field investigation. Site preparation equipment shall be included. Appropriate field testing equipment shall be included.

2. A track-mounted rig is recommended for this work. Access to the structures and some areas is via unimproved roads.

E. SCHEDULE

The timeline to complete the tasks herein must be generated by the Contractor for approval by the NRCS CO prior to initiation of work. The timeline to complete the geological investigation will be during Phase I.

F. PRE-INVESTIGATION CONFERENCE

Attend a pre-investigation conference with the NRCS State Conservation Engineer, Contracting Official Representative (COR)/CO, NRCS Geologist, and other NRCS staff, as appropriate prior to the start of any work. This may be held at the

Yadkinville Field Office, via teleconference or web meeting, or site walk-through if requested in advance.

G. GEOLOGICAL INVESTIGATIONS

1. General Drilling Plan Guidance and Requirements

   The geotechnical investigation includes auger drilling, standard penetration testing, rock coring, testing, sampling, measuring, and grouting. The geotechnical investigation shall be performed at various locations that include the existing auxiliary spillways, potential spillway expansion areas, existing spillway exit areas, top of dams, side slopes of the embankments, along the downstream toe of the embankments and potential borrow areas. The geotechnical investigation should gather enough information and testing so that an alternative for repair can be determined.

   Boreholes in embankment fill shall be advanced by hollow-stem augers. Wash boring shall not be used in these investigations. All, borehole will be left open using a tremie pipe for 24-hours for a water level reading. After the 24-hour water level reading is measured and recorded the borehole shall be filled to a settled depth within 12-inches of the ground surface. The upper borehole can be filled with soil then seeded and mulched.

2. Dam

   One (1) borehole will be drilled at the centerline of each dam to a depth of the approximate original ground. Boreholes shall be drilled on the upstream and downstream slopes. The borehole shall not penetrate through the embankment fill or core trench into original ground. The upstream slope borehole shall not penetrate the foundation drain of the dams. Testing shall include continuous standard penetration testing in the upper ten (10) feet then continue with SPT on 5-foot centers. Two (2) undisturbed samples shall be taken at each embankment zone or a sufficient number to characterize the embankment fill. The tremie pipe shall be inserted in the borehole after drilling and the hole shall be left open 24-hours for a water level reading. After measuring and recording the water level, the boreholes shall be grouted with a concrete and bentonite grout to within 12 inches of the ground surface.

3. Downstream Toe/Foundation

   One (1) borehole will be drilled at the downstream toe of each dam. Testing shall include continuous standard penetration testing (SPT) in the upper ten (10) feet

then continue with SPT on 5-foot centers to rock or sufficient depth for embankment planning.

4. Principal Spillway

   If the principal spillway does not have adequate hydraulic capacity and the riser and principal spillway pipe is replaced, a sufficient number of boreholes should be drilled to investigate the alignment of the new principal spillway. The boreholes should provide designers with information about bearing strengths, depths to rock, shear values and any parameters for design.

5. Auxiliary Spillway

   A minimum of two (2) boreholes will be drilled in each of the dams' auxiliary spillways. Dam #19A has two auxiliary spillways with one on each abutment. Boreholes will be drilled on the inside edge of the spillway. One (1) borehole will be drilled at the control section to the elevation of the floodplain. A second borehole will be drilled in the outlet end of the auxiliary spillway to auger refusal or the flood plain elevation. Borehole will have continuous Standard Penetration Testing (SPT) in the upper 10 feet followed by SPT on 5-foot centers. At auger refusal, a minimum of 10 feet of rock coring should be completed. Geotechnical investigation should gather sufficient information for headcut erodibility index determinations for each layer identified during the drilling. Sufficient soil samples should be tested for graduation, Atterberg Limits, dispersion for SITES analysis of the auxiliary spillway layers.

6. Borrow Areas

   Investigate borrow areas as need to provide embankment materials to raise embankment and block or fill present auxiliary spillways. Contractor shall work with the CO and Yadkinville Field office to identify and secure land rights for boreholes and sampling. The number of borehole should be sufficient to accurately estimate type and quantities of the materials present. Materials should be tested for graduation and Atterberg's classification, natural moisture content, compaction and dispersion.

H. DELIVERABLES

Deliverables shall be a detailed geologic investigation and a geotechnical report signed and sealed by a professional engineer licensed in the State of North Carolina, but is not limited to:

1. Plan view map of the site that illustrates the location of all boreholes and test pits.

2. Detailed, type-written, complete borehole and test pit logs.

3. Profiles of the auxiliary spillways showing layers, sample locations, "n" values and headcut erodibility values for each layer.

4. Profiles of the embankment showing layers or zones, sample locations and “n” values.

5. Profiles of the embankment showing layers or zones, sample locations and “n” values.

6. Complete rock core samples contained in labeled boxes conforming to NEH Part 631, Chapter 5.

7. Photographs of rock core samples conforming to NEH Part 631, Chapter 5.

8. Printouts for the computer modeling runs or results for the seepage and slope stability evaluations.

9. Complete printouts, forms, and/or calculation sheets of all soil laboratory tests conducted. This shall include all the appropriate input values required for complete calculation sheets from NEH Part 628 Chapter 52 Appendices 52B and 52C, Field Procedures Guide for the Headcut Erodibility Index, for the soil and rock properties in the auxiliary spillway footprint.

10. Geologic Investigation and Soil Mechanics Testing are to be in separate reports.

Attachment 3 - Development of Public Participation Plan

Work with sponsor and NRCS to develop Public Participation Plan (PPP) (see Example).

1. Determine purpose and objectives for the PPP

2. Develop mailing list of stakeholders (agencies, groups, individuals, landowners, including those in the breach inundation zone of the dam). NRCS and Sponsor will assist by providing available stakeholder contact information. Follow requirements from EO-10584 to contact other Water Resource Planning agencies based on coverage of the watershed area.

3. Determine what the public/agencies will be asked to comment on, when and by what methods.

4. Determine what information needs to be provided to the public, when and by what methods.

5. As a minimum, public inputs should be obtained on the scope of concerns/issues to be addressed, alternatives to be considered, environmental, social, cultural and economic concerns to be evaluated and the selected plan from the following.

    - Yadkin Soil and Water Conservation District
    - Yadkin County Planning Department
    - Yadkin County Commissioners
    - Yadkin County Emergency Services

6. Complete PPP plan for Sponsor and NRCS review and concurrence.

7. Finalize and update as needed.

Applicable Plan-Environmental Document Sections: Scope of the EA or Scope of the EIS -Consultation and Public Participation.

EXAMPLE

PUBLIC PARTICIPATION PLAN
for
Deep Creek Watershed - Dam 19A and 21

Watershed Rehabilitation Program

OBJECTIVES OF THE PUBLIC PARTICIPATION PLAN

1. Ensure that the general public, including private groups, and government agencies; at local, county and state levels are thoroughly familiarized with the proposed Deep Creek Watershed Dam rehabilitation project.
2. Provide a forum for the reception and consideration of public input regarding the project. The desired input includes not only opinion, but also uncollected data.
3. Clarify the effects of the diverse alternatives under consideration.
4. Collect pre-existing resource data regarding the Deep Creek Watershed. The data will be collected from a multitude of agencies and citizens.
5. Incorporate written and verbal comments into the decision making process.

TECHNIQUES TO ENSURE PUBLIC PARTICIPATION

1. Hold a meeting between NRCS and the Sponsor to explain the Dam Rehabilitation Program and process.
2. Contact local agencies and illustrate the rehabilitation program and request existing resource data about the watershed.
3. Determine if participation by potential National Environmental Policy Act (NEPA) Cooperating Agencies is needed and if so, the required scope and extent of their participation
4. Contact local media representatives to request their assistance informing the public
5. Provide opportunities to share information and obtain input from all project Sponsors
6. Post notices in local stores, township buildings and other gathering places to announce public meetings
7. Discuss ongoing developments at meetings to explain the rehabilitation process and seek input regarding the project problems and opportunities, the range of alternatives, and the potential project impacts.
8. Develop an email address list to facilitate electronic notification and updates as needed

INFORMATION PROVIDED AND OBTAINED

1. Early in the Planning Process

   a. Information Provided:

      i. NRCS Dam Rehabilitation Program Outline
      ii. Objectives of the Deep Creek Watershed Plan-Environmental Document
      iii. Known watershed problems and opportunities
      iv. Discussion of the included alternatives
      v. Explanation of the process through completion

   b. Information Obtained:

      i. Watershed natural resource problems that should be addressed
      ii. Data and other information that may be pertinent to the planning activities
      iii. Alternatives that should be considered and how the diverse alternatives may affect their property and lives.
      iv. Range of effects that should be determined relative to the evaluated alternatives.

2. Later in the Planning Process

   a. Information Provided:

      i. Identified problems and opportunities
      ii. Sponsor objectives
      iii. Alternatives considered
      iv. Alternatives evaluated including a comparison of effects (ecological, economic, social, physical, cultural, etc.)
      v. Preferred alternative
      vi. Draft Supplemental Plan–Environmental Document
      vii. Finding of No Significant Impact (FONSI) for an Environmental Assessment (EA) or Record of Decision (ROD) for an Environmental Impact Statement (EIS)

   b. Information Obtained:

      i. Verbal and written feedback/comments on the above items

      .

SCHEDULE OF PUBLIC PARTICIPATION SUPPORT ACTIVITIES AND CONTACTED PARTY (Dates and Entity to be Determined)

1. First planning meeting
   Date – *<Enter Date>*
   Location – Yadkin County
   Responsibility – *<Enter Responsibly Entity>*

2. Public/Interagency Early Scoping Meeting.
   Date – *<Enter Date>*
   Location – Yadkin County
   Responsibility – *<Enter Responsibly Entity>*

3. Technical Review of Preliminary Plan-Environmental Document
   Date – *<Enter Date>*
   Responsibility – NRCS/NWMC

4. Alternatives Meeting.
   Date – *<Enter Date>*
   Location – Yadkin County
   Responsibility – *<Enter Responsibly Entity>*

5. Public Review and 45-day Public Comment Period.
   Date – *<Enter Date>*
   Responsibility – NRCS *and* *<Enter Responsibly Entity>*

6. Final Plan-Environmental Document
   Date – *<Enter Date>*
   Responsibility – NRCS *and* *<Enter Responsibly Entity>*

7. Publish Finding of No Significant Impact (FONSI)
   Date – *<Enter Date>*
   Responsibility – NRCS *and* *<Enter Responsibly Entity>*

MONITORING AND PLAN REVISIONS

At the completion of each of the following milestones a review of the Public Participation Plan will be made and any needed changes will be made at that time.

MILESTONES:

1. Public/Interagency Scoping Meeting
2. Sponsor decides on preferred alternative
3. Technical review of Preliminary Plan-Environmental Document
4. Public review of Draft Plan-Environmental Document
5. Completion of Final Plan-Environmental Document

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Attachment 4 – Schedule of Work and Timeline

Phase and Deliverables	Duration (Days)	Days from NTP	Date
Phase I - Identify Problems and Determine Objectives			
1. Evaluate Existing Site Conditions	30	30	
2. Perform geologic and geotechnical investigations	60	90	
3. Perform general data collection for hydrologic analyses	40	130	
4. Perform a beach inundation analyses	30	160	
5. Evaluate and recommend hazard classifications for the existing dam and proposed structural rehabilitation alternatives	30	190	
6. Perform Hydrologic and Hydraulic Evaluation of the Existing Dam	30	220	
7. Perform Routings of Frequency-based Floods	30	250	
8. Public Participation and Scoping	40	290	
Performance time for Phase I	290	290	
Phase II – Inventory Resources and Analyze Resource Data			
1. Environmental	30	320	
2. Social	30	350	
3. Economic	30	380	
Performance time for Phase II	**90**	**380**	
Phase III – Alternative Formulation, Evaluation, and Decision			
1. Public Participation	**40**	**420**	
2. Formulate and Evaluate Alternatives	**40**	**460**	
Performance time for Phase III	**80**	**460**	
Phase IV - Preparation of Plan-Environmental Document			
1. Preparation of Initial Version of the Preliminary Plan-Environmental Document Report for NRCS/Sponsor Review	**40**	**500**	
2. Preparation of Preliminary Plan-Environmental Document for NRCS NWMC Review	**40**	**540**	
3. Address NWMC Comments and Concerns	**40**	**580**	
4. Preparation of Draft Plan-Environmental Document	**50**	**630**	

Phase and Deliverables	Duration (Days)	Days from NTP	Date
5. Public Participation	**40**	**670**	
6. Preparation of Final Plan-Environmental Document	**60**	**730**	
Performance time for Phase IV	**280**	**730**	
Total Performance time for All Phases		**730**	