DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SOUTH ATLANTIC DIVISION
60 FORSYTH STREET SW, ROOM 10M15
ATLANTA, GA 30303-8801

CESAD-PDP

29 March 2021

MEMORANDUM FOR Commander, Mobile District, 109 St. Joseph Street, Mobile, AL 36602

Subject: Approval of the Revised Review Plan for the Selma, Alabama, Flood Risk Management Feasibility Study

1. References:

a. Mobile District, CESAM-PD-FP memorandum (Request for Approval of the Review Plan (RP) for Selma, Alabama, Flood Risk Management Feasibility Study), 9 November 2020.

b. HQ USACE, CECW-PX memorandum (Revised Delegation of Authority in Section 2034(a)(5)(A) of the Water Resources Development Act of 2007 (WRDA 2007), as amended (33 U.S.C. 2343)), 9 November 2020.

2. Mobile District prepared the revised review plan (enclosed) for the Selma Flood Risk Management Feasibility Study consistent with EC 1165-2-217. The revised review plan documents the risk-informed decision not to conduct Type I Independent External Peer Review. The District coordinated the revised review plan with the Flood Risk Management Planning Center of Expertise (FRM-PCX), which is the lead office to execute this review plan. The FRM-PCX assigned Michelle Kniep as the FRM-PCX Regional Manager for South Atlantic Division's flood risk management studies.
Ms. Kniep can be contacted at (314) 331-8404.

3. I approve this revised review plan. After removing team roster attachments, Mobile District shall post the enclosed review plan to their district website. The approved review plan is subject to change as circumstances require, consistent with study development under the project management business process. Subsequent revisions to this approved review plan, due to significant changes in the study, study scope, or level of review, will require new written approval from this office.

4. The point of contact for this action is David Bauman at (404) 562-5202 or David.J.Bauman@usace.army.mil.

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JASON E. KELLY, PMP
Colonel, EN
Commanding

SELMA FLOOD RISK MANAGEMENT (FRM) REVIEW PLAN
5 March 2021

Project Name: City of Selma, Alabama Flood Risk Management (FRM) Study

P2 Number: 473358

Decision Document Type: Feasibility Report

Project Type: Flood Risk Management

District: Mobile

District Contact: Plan Formulator – (251) 690-2558

Major Subordinate Command (MSC): South Atlantic Division (SAD)

MSC Contact: SAD Point of Contact – (404) 562-5202

Review Management Organization (RMO): Flood Risk Management Planning Center of Expertise

RMO Contact: FRM-PCX SAD Regional Manager – (314) 331-8404

Table A: Key Review Plan Dates

Action	Status
Date of RMO Endorsement of Review Plan	14 February 2019; 22 July 2020
Date of MSC Approval of Review Plan	03 March 2019
Date of IEPR Exclusion Approval	Pending
Has the Review Plan Changed Since PCX Endorsement?	No significant changes; minor edits by SAD
Date of Last Review Plan Revision	5 March 2021
Date of Review Plan Web Posting	17 March 2019
Date of Congressional Notifications	Pending

Table B: Milestone Schedule

Milestone	Scheduled	Actual	Complete
Alternatives Milestone	16 Jan 2019	16 Jan 2019	Yes
Tentatively Selected Plan	22 Jul 2020	22 Jul 2020	Yes
Release Draft Report to Public	17 Sept 2020	17 Sept 2020	Yes
Agency Decision Milestone	11 Dec 2020	15 Dec 2020	Yes
Final Report Transmittal	09 Apr 2021		No
Senior Leaders Briefing	28 Jun 2021		No
Chief's Report or Director's Report	07 Oct 2021		No

SELMA FRM PROJECT FACT SHEET
June 2020

Project Name: City of Selma, Alabama Flood Risk Management (FRM) Study

Location: Selma, Alabama

Authority: The study's authority is contained in the House of Representatives Resolution adopted on 7 June 1961 by the Committee of Public Works.

Sponsor: City of Selma, Alabama

Type of Study: Feasibility Flood Risk Management Study and Environmental Assessment

SMART Planning Status: The study is 3x3x3 compliant

Project Area: The City of Selma is located on the Alabama River in south central Alabama. The city is one hour west of Montgomery, Alabama on US Highway 80. The city is approximately 30 miles downstream of the USACE Robert F. Henry Lock and Dam Navigation Project and 60 miles upstream of Miller's Ferry Lock and Dam Navigation Project.

Problem Statement: Rainfall events cause flooding and riverbank erosion from and along the Alabama River, increasing the flood risk and damages to the national historically significant and vulnerable community of Selma, Alabama. This includes preregulation development within the current FEMA designated floodplains. The 0.2% flood plain includes one school, one fire department, and a total of 2,310 structures.

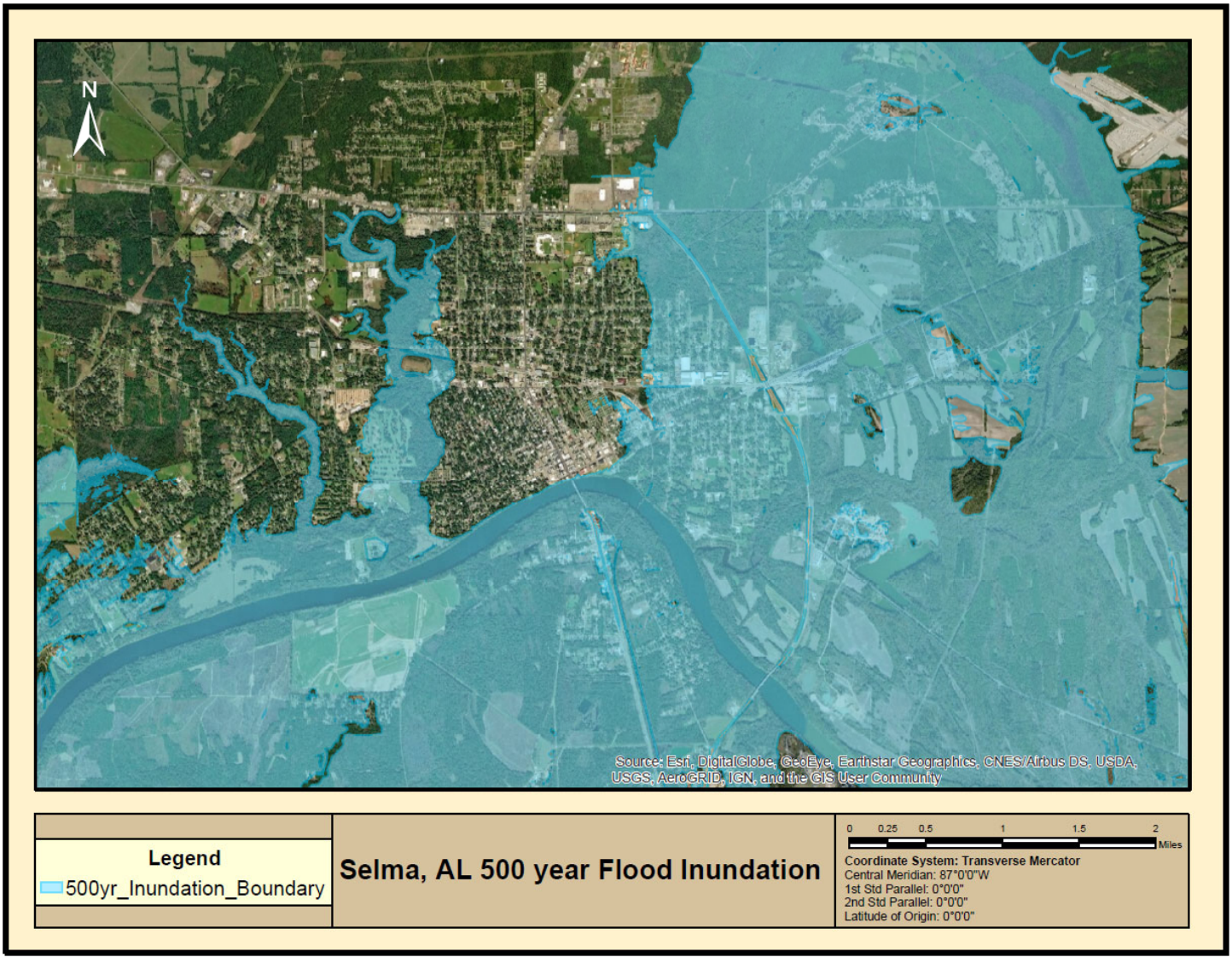
Federal Interest: Federal interest in flood risk management is to increase net National Economic Development (NED), and public and life safety benefits. Potential FRM measures include both structural and nonstructural measures. Structural measures may include construction of levees, floodwalls, bank stabilization, sluice gate and pump station. Nonstructural floodplain management measures would include assisting the non-Federal sponsor with land acquisitions and relocations in accordance with P.L. 91-646, Uniform Act, as amended, land use management and flood warning systems in areas where needed. In addition, flood proofing and/or elevation of structures will be considered. 2,310 structures within the 0.2% ACE floodplain of the study area are estimated to have a structural value of over $221 million. The estimated total project cost is not likely to be greater than $200 million.

Risk Identification: There are currently historic structures (buildings) in the area that sit along the eroding bankline of the Alabama River in Selma, AL. Some of the structures have been condemned in the past and demolished due to immiment threat of bankline failure in those locations. The City of Selma and property owners took proper precautions to ensure public safety and continue to monitor the stability of the remaining

structures to reduce immenent threats to human life or safety. A brief analysis of the bankline and historic building stability will be discussed in the draft report. There are no structures (dam, levees) constructed in the floodplain that pose a significant or immediate threat to human life or safety in the study area. All of the critical infrastructure is outside of the FEMA 100 year floodplain. At this time the study, implementation, and performance risk are low to medium.

While there is a high level of visibility and interest in this study due to its historic geographic location, controversy is not expected. The integrated Feasibility Report and NEPA document will be an EA. Study assessments have determined that mitigation is not necessary and there are no impacts to threatened and endangered species. Due to extenuating agency circumstances, and with coordination of the vertical team, it is understood that there may not be a Fish and Wildlife Coordination Act Report provided.

Figure 1: Study Area Map



FACTORS AFFECTING THE LEVELS OF REVIEW

1. Scope of Review. This section discusses factors affecting the risk informed decisions on the appropriate levels of review.

a. Will the study likely be challenging? Economically justifying the study presented a challenge, however the PDT submitted an NED Exception Memo that was approved 10 June 2020 and allows for assessment of Other Social Effects Account to justify the project.

b. Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks.

(1) While the Fish and Wildlife Alabama Ecological Services Office would not provide a Fish and Wildlife Coordination Act Report or Planning Aide Letter it is not anticipated to increase study time or cost.

(2) The risk of impacting a cultural site is a concern since Selma is a city of historical significance. The PDT plans to conduct a Phase I survey during Project Engineering and Design Phase of the study. If a cultural impact is found, mitigation may occur which may impact study schedule and implementation costs during that phase.

(3) Maintenance efforts and costs for several alternatives are potentially high and would be assumed by the City. No action could have the potential to adversely affect the historic and cultural viewshed setting in Selma. This uncertainty presents a moderate to high risk for the project.

c. Is the project likely to be justified by life safety or is the study or project likely to involve significant life safety issues? The project is not likely to be justified by life safety and has a minimal life safety issue. There are no known recorded deaths associated with any modern flood event in the study area in the last 20 years. While the depths along the river can reach 13 feet, it does not reach maximum depth levels uniformly through densely populated areas and is primarily confined to low laying areas.

(1) During the 1% ACE event, the average channel velocity is 6 feet per second and up to 1 feet per second in the floodplain. The water depths vary up to a maximum of 13 feet inside the 1% ACE floodplain. Further, there are 1,305 structures in the 1% ACE floodplain. Population at risk in the 1% ACE is estimated to be about 3,315 during the day and about 4,806 at night based on HAZUS data.

(2) During the 0.2% ACE event, the average velocity is 7 feet per second and up to 1 feet per second in the floodplain. The water depths vary up to a maximum of 14 feet inside the 0.2% ACE floodplain. There are an estimated 2,310 in the .2% ACE floodplain. Population at risk in the .2% ACE is estimated to be about 5,365 during the day and about 7,254 at night based on HAZUS data.

(3) As part of the study analysis, threats to human life and safety will be assessed. The District Engineer finds that life and safety are not likely to be a significant issue with this study. Flooding from the Alabama River occurs with ample warning time, usually on the order of 2-3 days. Stream gages located along the river acting as forecast points also provide warning of future floods. Furthermore, only Wards 6 and 8, located on the upstream right bank from downtown, have depths and velocities that could possibly trigger a life safety risk. Adequate evacuation plans for these wards, such as road closures in low laying areas during flood events, would eliminate nearly all life safety risk which are minimal. Detailed plans are being reviewed and updated as part of this study.

d. Has the Governor of an affected state requested a peer review by independent experts? The Alabama Governor has not requested a peer review by independent experts.

e. Will the study likely involve significant public dispute as to the project's size, nature, or effects? Given the national significance of the area, much attention may arise; however, the project is not likely to involve significant public dispute unless negative viewpoints originate from the community regarding proposed alternatives such as buyouts. Alternatives were provided to the public for review with few opposing very limited buyouts.

f. Is the project/study likely to involve significant public dispute as to the economic or environmental cost or benefit of the project? The study will not likely involve significant public dispute as to the economic or environmental cost or benefit of the project since it is not likely to negatively impact the local environment or economy.

g. Is the information in the decision document or anticipated project design likely to be based on novel methods, involve innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices? It is not likely that any of the information in the decision document will be based on novel methods or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices.

h. Does the project design require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule? The project is not anticipated to require unusual redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule.

i. Is the estimated total cost of the project greater than $200 million? The anticipated total cost of the project is less than $200 million.

j. Will an Environmental Impact Statement be prepared as part of the study? It is anticipated that there will not be significant environmental impacts and that an Environmental Assessment will be prepared.

k. Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources? Due to the national historic importance of the City of Selma, particularly in events such as the Civil War and the Civil Rights Movement, cultural and historic resources in the area have been well documented. The study will seek to avoid these known significant cultural, historic, and tribal areas where possible. In accordance with Section 106 of the National Historic Preservation Act, a reasonable and good faith effort will be made to identify any unknown cultural or historic resources, consultation with the Alabama State Historic Preservation Office and Interested Tribes will be conducted, and if necessary, mitigation plans and measures will be formulated collaboratively. Therefore, it is anticipated the project will not have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources.

l. Is the project expected to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures? Since the incorporation of the City of Selma in 1820, the wildlife habitat within the study area has experienced environmental degradation due to urban development, industry, and farming practices; consequently, wildlife species throughout the study area have acclimated to urban ecosystems. Therefore, the project is not expected to have substantial adverse impacts on fish and wildlife species and their habitat.

m. Is the project expected to have, before mitigation measures, more than a negligible adverse impact on an endangered or threatened species or their designated critical habitat? The project is not expected to have a negligible adverse impact on endangered or threatened species and their habitat. These impacts would be temporary during construction.

REVIEW EXECUTION PLAN

1. This section describes each level of review to be conducted. Based upon the factors discussed in Section 1, this study will undergo the following types of reviews:

a. District Quality Control**.** All decision documents (including data, analyses, environmental compliance documents, etc.) undergo DQC. This internal review process covers basic science and engineering work products. It fulfils the project quality requirements of the Project Management Plan.

b. Agency Technical Review. ATR is performed by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. These teams will be comprised of certified USACE personnel. The ATR team lead will be from outside the home MSC. If significant life safety issues are involved in a study or project a safety assurance review should be conducted during ATR.

c. Cost Engineering Review. All decision documents shall be coordinated with the Cost Engineering Mandatory of Expertise (MCX). The MCX will assist in determining the expertise needed on the ATR and IEPR teams. The MCX will provide the Cost Engineering certification. The RMO is responsible for coordinating with the MCX for the reviews. These reviews typically occur as part of ATR.

d. Model Review and Approval/Certification. EC 1105-2-412 mandates the use of certified or approved models for all planning work to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions.

e. Policy and Legal Review. All decision documents will be reviewed for compliance with law and policy. ER 1105-2-100, Appendix H provides guidance on policy and legal compliance reviews. These reviews culminate in determinations that report recommendations and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the home MSC Commander. These reviews are not further detailed in this section of the Review Plan.

Table 1 provides the schedules and costs for reviews. The specific expertise required for the teams are identified in later subsections covering each review. These subsections also identify requirements, special reporting provisions, and sources of more information.

Table 1: Levels of Review

Product(s) to undergo Review	Review Level	Start Date	End Date	Cost	Complete
Draft Feasibility Report and EA	District Quality Control	08/24/20	09/11/20	$50,000	No
Draft Feasibility Report and EA	Agency Technical Review	09/17/20	10/29/20	$60,000	No
Draft Feasibility Report and EA	Policy and Legal Review	09/17/20	10/29/20	n/a	No
Final Feasibility Report and EA	District Quality Control	01/25/21	02/12/21	$40,000	No
Final Feasibility Report and EA	Agency Technical Review	02/22/21	03/19/21	$40,000	No
Final Feasibility Report and EA	Policy and Legal Review	02/22/21	03/19/21	n/a	No

NOTE: This table may also be used to identify future review work in follow-on phases of a project. This may include products prepared during the pre-construction engineering and design phase or products prepared as part of planning for the Operations and Maintenance phase of a project.

DISTRICT QUALITY CONTROL

1. The home district shall manage DQC and will appoint a DQC Lead to manage the local review (see EC 1165-2-217, section 8.a.1). The DQC Lead should prepare a DQC Plan and provide it to the RMO and MSC prior to starting DQC reviews. Table 2 identifies the required expertise for the DQC team.

Table 2: Required DQC Expertise

DQC Team Disciplines	Expertise Required
DQC Lead	A senior professional with extensive experience preparing Civil Works decision documents and conducting DQC. The lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc.).
Planning	A senior water resources planner with experience in riverine flood risk management and knowledge of nonstructural policies.
Economics	A senior economist with experience in analysis of demographics, land use, and flood damage assessments using HEC-FDA; use of RECONS model to address regional economic development (RED) associated with a project; discussion of other social effects (OSE) associated with flood risk; and economic justification of FRM projects in accordance with current USACE policy.
Environmental Resources	A senior environmental resources specialist with experience with environmental evaluation and compliance requirements pursuant to the "Procedures for Implementing NEPA" (ER 200-2-2), national environmental laws and statutes, applicable Executive Orders, and other federal planning requirements for Civil Works projects, including mitigation planning.
Cultural Resources	A senior cultural resource specialist with experience with cultural resource survey methodology, area of potential effects, Section 106 of the National Historic Preservation Act, and state and federal laws/executive orders pertaining to American Indian Tribes.
Hydrology	A hydrologist with experience in urban hydrology, HEC-HMS and associated one and/or two-dimensional models, floodplain delineation, risk and uncertainty analysis, and a number of other closely associated technical subjects. The hydrologic reviewer could also serve as the hydraulic reviewer.
Hydraulic Engineering	A hydraulic engineer with experience with river hydraulics, HEC-GeoRAS, HEC-RAS and associated one and/or two-dimensional models, hydrologic statistics, sediment transport analysis, channel stability analysis, risk and uncertainty analysis, and a number of other closely associated technical subjects. The hydraulic reviewer could also serve as the hydrology reviewer.
Engineering – Geotechnical	A geotechnical engineer with experience with levee and riverbank stabilization design, construction, and maintenance.

Engineering – Civil and/or Structural	A civil and/or structural engineer with experience in the development of FRM projects, including selection and evaluation of project sites and alignments, bank stabilization structural design, construction, maintenance, and identification of facility/utility relocations.
Cost Engineering	A cost engineer with experience using required cost estimation software; working knowledge of construction and FRM; capable of making professional determinations based on experience.
Real Estate	A real estate specialist with experience in development of SMART Planning Real Estate Plans and have experience in real estate fee/easement acquisition and residential/business relocations for Federal and/or Federally-Assisted Programs as needed for implementation of Civil Works projects.

2. Documentation of DQC. Quality Control should be performed continuously throughout the study. A specific certification of DQC completion is required at the draft and final report stages. Documentation of DQC should follow the District Quality Manual and the MSC Quality Management Plan. An example DQC Certification statement is provided in EC 1165-2-217, (Figure F).

a. Documentation of completed DQC should be provided to the MSC, RMO and ATR Team leader prior to initiating an ATR. The ATR team will examine DQC records and comment in the ATR report on the adequacy of the DQC effort. Missing or inadequate DQC documentation can result in delays to the start of other reviews (see EC 1165-2-217, section 9).

b. Recommended Best Planning Practice: Use DrChecks software to document DQC. Attach a DrChecks report to the DQC Certification to help illustrate the thoroughness of the DQC.

AGENCY TECHNICAL REVIEW

1. The ATR will assess whether the analyses are technically correct and comply with guidance, and that documents explain the analyses and results in a clear manner. An RMO manages ATR. The review is conducted by an ATR Team whose members are certified to perform reviews. Lists of certified reviewers are maintained by the various technical Communities of Practice (see EC 1165-2-217, section 9(h)(1)). Table 3 identifies the disciplines and required expertise for this ATR Team.

Table 3: Required ATR Team Expertise

ATR Team Disciplines	Expertise Required
ATR Lead	A senior professional with extensive experience preparing Civil Works decision documents and conducting ATR. The lead should have the skills to manage a virtual team through an ATR. The lead may serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc.).
Planning	A senior water resources planner with experience in riverine flood risk management and knowledge of non-structural policies
Economics	A senior economist with experience in analysis of demographics, land use, and flood damage assessments using HEC-FDA; use of RECONS model to address RED associated with a project; understanding of qualitative assessment of OSE to socially vulnerable communities; and economic justification of FRM projects in accordance with current USACE policy.
Environmental Resources	A senior environmental resources specialist with experience with environmental evaluation and compliance requirements pursuant to the “Procedures for Implementing NEPA” (ER 200-2-2), national environmental laws and statutes, applicable Executive Orders, and other federal planning requirements for Civil Works projects, including mitigation planning.
Cultural Resources	A senior cultural resource specialist with experience with cultural resource survey methodology, area of potential effects, Section 106 of the National Historic Preservation Act, and state and federal laws/executive orders pertaining to American Indian Tribes.
Hydrology	A hydrologist with familiarity of inland hydrology climate change assessment and experience in urban hydrology, HEC-HMS and associated one and/or two-dimensional models, floodplain delineation, risk and uncertainty analysis, and a number of other closely associated technical subjects. The hydrologic reviewer could also serve as the hydraulic reviewer.
Hydraulic Engineering	A hydraulic engineer with experience with river hydraulics, HEC-GeoRAS, HEC-RAS and associated one and/or two-dimensional models, hydrologic statistics, sediment transport analysis, channel stability analysis, risk and uncertainty analysis, and a number of other closely associated technical subjects. The hydraulic reviewer could also serve as the hydrology reviewer.

Engineering - Geotechnical	A geotechnical engineer with experience with levee and riverbank stabilization design, construction, and maintenance.
Engineering – Civil and/or Structural	A civil and/or structural engineer with experience in the development of FRM projects, including selection and evaluation of project sites and alignments, bank stabilization structural design, construction, maintenance, and identification of facility/utility relocations.
Cost Engineering	A cost engineer with experience using required cost estimation software; working knowledge of construction and FRM; capable of making professional determinations based on experience.
Real Estate	A real estate specialist with experience in development of SMART Planning Real Estate Plans and have experience in real estate fee/easement acquisition and residential/business relocations for Federal and/or Federally-Assisted Programs as needed for implementation of Civil Works projects.
Climate Preparedness and Resilience CoP Reviewer	A member of the Climate Preparedness and Resiliency Community of Practice (CoP) will participate in the ATR review. The reviewer should have knowledge of inland hydrology climate change assessment policy and practice. This role can be filled by another discipline.
Risk and Uncertainty	A subject matter expert in multi-discipline flood risk analysis to ensure consistent and appropriate identification, analysis, and written communication of risk and uncertainty. This role can be filled by another discipline.

2. Documentation of ATR. DrChecks will be used to document all ATR comments, responses and resolutions. Comments should be limited to those needed to ensure product adequacy. If a concern cannot be resolved by the ATR team and PDT, it will be elevated to the vertical team for resolution using the EC 1165-2-217 issue resolution process. Concerns can be closed in DrChecks by noting the concern has been elevated for resolution. The ATR Lead will prepare a Statement of Technical Review (see EC 1165-2-217, Section 9), for the draft and final reports, certifying that review issues have been resolved or elevated. ATR may be certified when all concerns are resolved or referred to the vertical team and the ATR documentation is complete.

3. Recommended Best Planning Practice: All members of the ATR team should use the four part comment structure (see EC 1165-2-217, Section 9(k)(1)).

INDEPENDENT EXTERNAL PEER REVIEW

1. Type I IEPR. Type I IEPR is managed outside of the USACE and conducted on studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study.

2. Decision on Type I IEPR. A Type I IEPR will not be conducted for this study.

a. Per 5 April 2019, CECW-CE memorandum “Interim Guidance on Streamlining Independent External Peer Review (IEPR) for Improved Civil Works Product Delivery” there are three mandatory conditions which would trigger whether Type I IEPR is undertaken. These conditions are: when the estimated total cost of the project, including mitigation costs, is greater than $200 million; when the Governor of an affected state requests a peer review by independent experts; and, when the Chief of Engineers determines the project study is controversial due to significant public dispute over the size, nature, or effects of the project or the economic or environmental costs or benefits of the project (including but not limited to projects requiring an environmental impact statement (EIS)). As detailed in Section 1, this project does not meet any of these mandatory conditions.

b. Additionally, while none of the mandatory conditions were met, a risk-informed decision was made that the study would not significantly benefit from Type I IEPR.As noted earlier, the project is not likely to be justified by life safety, nor is it likely to involve significant life safety issues that have not already been addressed. There are no structures (dams, levees) constructed in the floodplain that pose a significant or immediate threat to human life or safety in the study area. The flooding along the Alabama River has been characterized as slow rising and drawdown floods that primarily impact the bank stability. There has been no indication of loss of life from previous flood events. After initial screening of measures, potential alternatives include structural measures such as bankline stabilization using soldier pile walls, and potential bridge modifications for added bankline stability. These measures would be analyzed to work synergistically with existing Federal and local projects authorized for implementation in the study area. If a structural solution is determined to be the selected plan, it is unlikely that failure would result in a significant threat to life safety; as all structural solutions will be designed to minimize this threat. An increase in the life safety risk to the population is not anticipated.

3. Type II IEPR.

a. The second kind of IEPR is Type II IEPR. These Safety Assurance Reviews are managed outside of the USACE and are conducted on design and construction for hurricane, storm and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. A Type II IEPR Panel will be convened to review the design and construction activities before construction begins, and until construction activities are completed, and periodically thereafter on a regular schedule.

b. Decision on Type II IEPR. There is insufficient detail available at this time determine whether or not to conduct a Type II IEPR. A determination on the need for a Type II IEPR will be made when the study moves into the Implementation Phase.

MODEL CERTIFICATION OR APPROVAL

1. EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models are any models and analytical tools used to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making. The use of a certified/approved planning model does not constitute technical review of a planning product. The selection and application of the model and the input and output data is the responsibility of the users and is subject to DQC, ATR, and IEPR.

2..The planning models listed in Table 5 may be used to develop the decision document.

Table 5: Planning Models

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Certification / Approval
HEC-FDA 1.4.2	The program integrates hydrologic engineering and economic analysis to formulate and evaluate plans using risk-based analysis methods. It will be used to evaluate/compare plans to aid in selecting a recommended plan.	Certified
HEC-FIA 2.2	The program integrates hydrologic engineering to identify the consequences from a single event. The consequences HEC-FIA computes include economic losses (losses to structures and their contents), and agricultural losses from these hydraulic events. HEC-FIA may be used based on the need to access the impacts of non-structural solutions.	Certified
RECONS	The model incorporates impact area data, as well as multipliers, direct ratios (jobs to sales, income to sales, etc.), and geographic capture rates. RECONS will be used to determine the RED benefits of the alternatives.	Certified
HEP (Habitat Evaluation Procedures)	The Habitat Evaluation Procedures (HEP) is an established approach to assessment of natural resources. The HEP approach has been well documented and is approved for use in Corps projects as an assessment framework that combines resource quality and quantity over time, and is appropriate throughout the United States. The Habitat Suitability Index (HSI) models are the format for quantity determinations that are applied within the HEP framework. Only HEP models which have been certified or approved for use will be utilized for this study. ATR of input data is required in all instances.	Certified or Approved for Use

3. EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE developed and commercial engineering software will continue. The professional practice of documenting the application of the software and modeling results will be followed. The USACE Scientific and Engineering Technology Initiative has identified many engineering models as preferred or acceptable for use in studies. These models should be used when appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR.

The following engineering models may be used to develop the decision document.

Table 6: Engineering Models.

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Approval Status
HEC-RAS 5.0 (River Analysis System)	The software performs 1-D steady and unsteady flow river hydraulics calculations and has capability for 2-D (and combined 1-D/2-D) unsteady flow calculations. It will be used for steady flow analysis to evaluate the future without-project and future with-project conditions.	HH&C CoP Preferred Model
GeoStudio Slope/W 2016 (Slope Stability Analysis)	The software is used to model constructed slopes and analyze their factor of safety against sliding or global failure. This model type accounts for soil strength parameters, pore water pressures, and unique loading conditions (i.e. rapid drawdown). It will be used to assess the possible alternatives for bank stabilization.	Geotechnical CoP Accepted Slope Stability Software

POLICY AND LEGAL REVIEW

1. Policy and legal compliance reviews for draft and final planning decision documents are delegated to the MSC (see Director's Policy Memorandum 2018-05, paragraph 9).

a. Policy Review. The policy review team is identified through the collaboration of the MSC Chief of Planning and Policy and the HQUSACE Chief of the Office of Water Project Review. The team is identified in Attachment 1 of this Review Plan. The makeup of the Policy Review team will be drawn from Headquarters (HQUSACE), the MSC, the Planning Centers of Expertise, and other review resources as needed.

(1). The Policy Review Team will be invited to participate in key meetings during the development of decision documents as well as SMART Planning Milestone meetings. These engagements may include In-Progress Reviews, Issue Resolution Conferences or other vertical team meetings plus the milestone events.

(2). The input from the Policy Review team should be documented in a Memorandum for the Record (MFR) produced for each engagement with the team. The MFR should be distributed to all meeting participants.

(3). In addition, teams may choose to capture some of the policy review input in a risk register if appropriate. These items should be highlighted at future meetings until the issues are resolved. Any key decisions on how to address risk or other considerations should be documented in an MFR.

2. Legal Review.

a. Representatives from the Office of Counsel will be assigned to participate in reviews. Members may participate from the District, MSC and HQUSACE. The MSC Chief of Planning and Policy will coordinate membership and participation with the office chiefs.

(1). In some cases legal review input may be captured in the MFR for the particular meeting or milestone. In other cases, a separate legal memorandum may be used to document the input from the Office of Counsel.

(2). Each participating Office of Counsel will determine how to document legal review input.