



REPLY TO
ATTENTION OF

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

14 March 2019

MEMORANDUM FOR Commander, Mobile District

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

1. References:

a. Memorandum, CESAM-PD-FP, 28 February 2019, subject: Request for Approval of the Review Plan (RP) for Selma, Alabama, Flood Risk Management Feasibility Study.

b. Memorandum, CECW-P, 7 June 2018, subject: 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).

2. Mobile District prepared the review plan for the Selma Flood Risk Management Feasibility Study consistent with EC 1165-2-217. The District coordinated the review plan with the Flood Risk Management Planning Center of Expertise (FRM-PCX), which is the lead office to execute this review plan. For further information, contact Michelle Kniep, FRM-PCX Regional Manager for South Atlantic Division at (314) 331-8404.

3. I approve this review plan. 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.

DIANA M. HOLLAND
Brigadier General, USA
Commanding

REVIEW PLAN
February 2019

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 [REDACTED]

Major Subordinate Command (MSC): South Atlantic Division

MSC Contact: SAD Planning Division, [REDACTED]

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

RMO Contact: FRM-PCX SAD Regional Manager – [REDACTED]

Key Review Plan Dates

Date of RMO Endorsement of Review Plan: Pending

Date of MSC Approval of Review Plan: Pending

Date of IEPR Exclusion Approval: N/A

Has the Review Plan changed since PCX Endorsement? No

Date of Last Review Plan Revision: None

Date of Review Plan Web Posting: Pending

Date of Congressional Notifications: Pending

Milestone Schedule

Milestone	Scheduled	Actual	Compete
Alternatives Milestone	<u>16 Jan 2019</u>	<u>16 Jan 2019</u>	<u>Yes</u>
Tentatively Selected Plan	<u>4 Oct 2019</u>		
Release Draft Report to Public	<u>03 Apr 2020</u>		
Agency Decision Milestone	<u>29 Jun 2020</u>		
Final Report Transmittal	<u>08 Mar 2021</u>		
Senior Leaders Briefing	<u>25 May 2021</u>		
Chief's Report or Director's Report	<u>03 Sep 2021</u>		

Project Fact Sheet
February 2019

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 is 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: The level of threat to human life and safety is currently being studied.

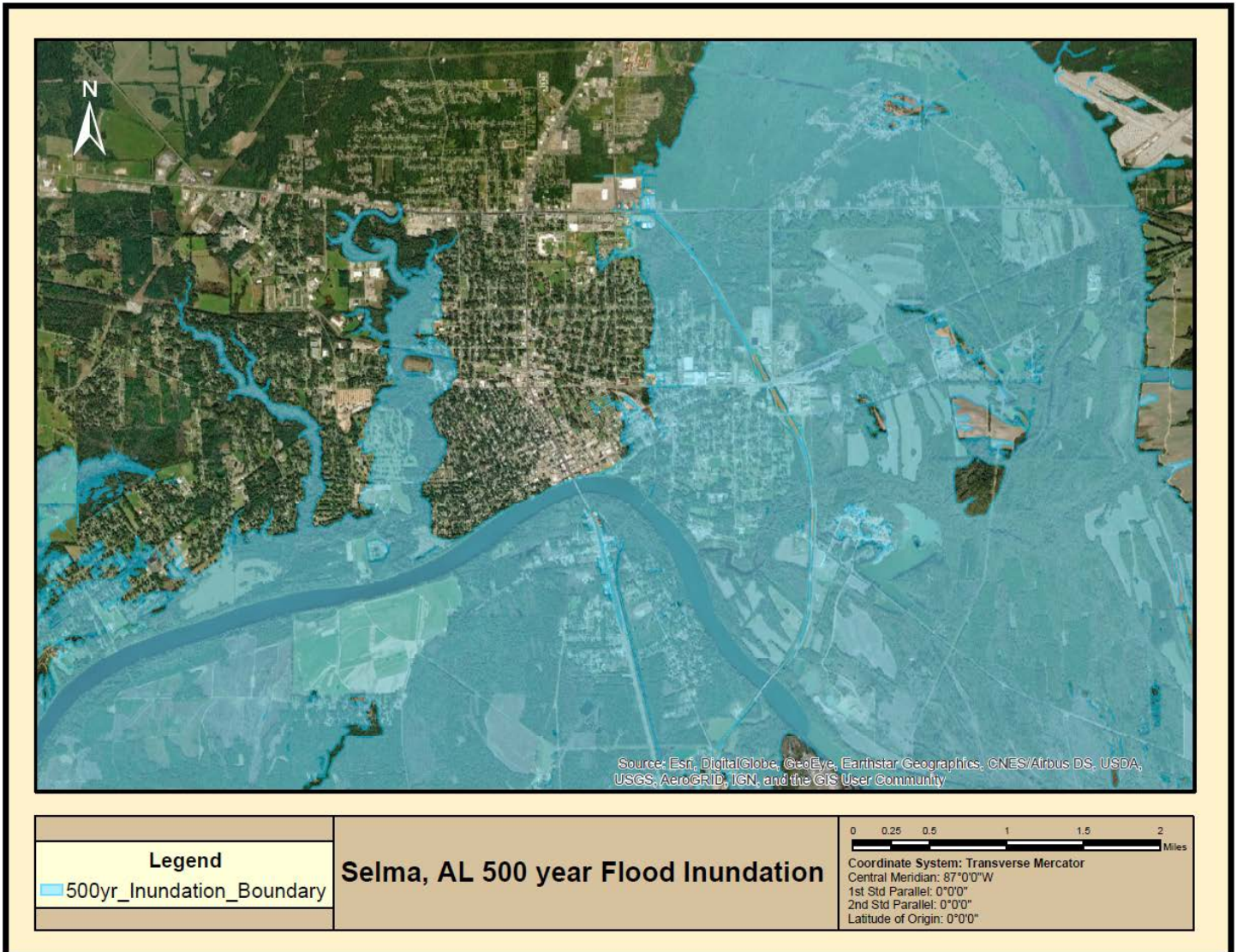
At this time, the District Chief of Engineering assumes there are likely to be life safety concerns consistent with most flood risk management projects. The impacted area is primarily residential, though it does include some businesses. HEC-LifeSim, an agent based simulation system for estimating life loss, will be developed by the Project Delivery Team (PDT) prior to the Tentatively Selected Plan (TSP) Milestone to better assess life safety risks.

Aside from having a potential threat to human life, there is some chance that the study could encounter a high level of public interest or social challenges over and above a typical feasibility study. Controversy is not expected, however heightened interest may be encountered under social viewpoints or cultural resources depending on selected alternative.

Until a footprint is identified, the environmental impacts are not determined; however it's anticipated that the NEPA document will be an EA, with no anticipated mitigation for threatened and endangered species. A known environmental study risk is the Fish and Wildlife Coordination Act Report may be delayed in receipt, should they prepare it.

Additionally, there is an inherit risk using existing data that is assumed sufficient including: tax assessor data, and physical, hydrodynamic and environmental conditions.

Figure 1: Study Area Map



1. FACTORS AFFECTING THE LEVELS OF REVIEW

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

- Will the study likely be challenging? There is an anticipated challenge that will arise from this study. An economically justified plan may be a challenge to identify due to the potential benefits and costs for engineering solutions to flood damages and associated risks to the city of Selma. The 4 Principles and Guidelines accounts (Environmental Quality, National Economic Development, Regional Economic Development, Other Social Effects), with special attention to the Other Social Effects will be used for plan formulation.

Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks. (1) The risk is that the Fish and Wildlife Alabama Ecological Services Office would not be able to provide a Fish and Wildlife Coordination Act Report or Planning Aide Letter which would result in additional study time and cost to the study for increased coordination. (2) The risk of impacting a cultural site is a concern since Selma is a city of historical significance. A general cultural inventory is being developed for the areas that have been identified in the Alternatives Milestone. The PDT also plans to conduct a Phase I survey. If a cultural impact is found, reformulation or mitigation may occur which may impact study schedule and implementation costs. (3) Maintenance efforts and costs for several alternatives are potentially high and would be assumed by the City. The outcome risk may be considered high depending on the experience and capabilities of the the non-Federal sponsor. (4) There is a risk that levee/floodwall alignments fall where the soil conditions are not suitable without extensive site preparation or site modifications which would cause a larger implementation construction cost. This risk will be captured in the risk based contingency which will drive the cost up for a project that already has concerns of economic justification. (5) Although not expected, an increase to study schedule and costs are anticipated if the PDT incorrectly assumed conditions such as no impact to Threatened & Endangered Species, no impacts from HTRW, safe access to watershed, no environmental seasonal construction restrictions, no quantitative ecological modeling and planning modeling certification would be required, and water quality certification timely provided.

- 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.

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.

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.

As part of the study analysis, threats to human life and safety will be assessed. However it is not likely to be a significant issue with this study.

- 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.
- 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. Focus group meetings and sponsor communication will be implemented to educate the local public and interest groups of the benefits and concerns of the potentially proposed projects, and understand any local concerns.
- 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.
- 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? Construction methods or designs have not been determined, particularly for river bank stabilization; however, the anticipated project design for levees and other structural measures is not likely to 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.
- 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.

- Is the estimated total cost of the project greater than \$200 million? The anticipated total cost of the project is less than \$200 million.
- 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.
- 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.
- 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. Common species within the study area include the armadillo, (*Dasypus novemcinctus*), opossum (*Didelphis virginiana*), grey squirrel (*Sciurus carolinensis*), white-tailed deer (*Odocoileus virginianus*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), osprey (*Pandion haliaetus*), eastern towhee (*Pipilo erythrophthalmus*), common snapping turtle (*Chelydra serpentina serpentina*), Alabama map turtle (*Graptemys pulchra*), Fowler's toad (*Anaxyrus fowleri*), and the smooth hornsnail (*Pleurocera prasinata*).
- 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? Wildlife habitat degradation from urban development, industry, and farming practices have resulted in an urban ecosystem with limited terrestrial environmental resources; however, aquatic resources within the study area have been documented. Potential direct or indirect impacts to these species and/or their critical habitat would be avoided or mitigated. Therefore, the

project is not expected to have more than a negligible adverse impact on an endangered or threatened species or their designated critical habitat. Federally listed species for Dallas County include the threatened Alabama Moccasinshell (*Medionidus acutissimus*), endangered Heavy Pigtoe (*Pleurobema taitianum*), threatened Orangenacre Mucket (*Lampsilis perovalis*), endangered Ovate Clubshell (*Pleurobema perovatum*), endangered Southern Clubshell (*Pleurobema decisum*), endangered Alabama Sturgeon (*Scaphirhynchus suttkusi*), threatened Tulotoma Snail (*Tulotoma magnifica*), endangered Alabama Canebrake Pitcher-plant (*Sarracenia rubra* ssp. *Alabamensis*), threatened Georgia Rockcress (*Arabis georgiana*), threatened Price's Potato-bean (*Apios priceana*), endangered Red-cockaded Woodpecker (*Picoides borealis*), and the Wood Stork (*Mycteria Americana*). Of the listed species within Dallas County, the Alabama Moccasinshell, Alabama Sturgeon, Georgia Rockcress, Orangenacre Mucket, and Southern Clubshell have final designated critical habitat within the study area.

2. REVIEW EXECUTION PLAN

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:

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 fulfills the project quality requirements of the Project Management Plan.

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.

Independent External Peer Review. Type I IEPR may be required for decision documents under certain circumstances. This is the most independent level of review, and is applied in cases that meet criteria where the risk and magnitude of the project are such that a critical examination by a qualified team outside of USACE is warranted. A risk-informed decision is made as to whether Type I IEPR is appropriate.

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.

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.

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.

Product(s) to undergo Review	Review Level	Start Date	End Date	Cost	Complete
Draft Feasibility Report and EA	District Quality Control	<u>02/03/20</u>	<u>02/14/20</u>	\$50,000	No
Draft Feasibility Report and EA	Agency Technical Review	<u>04/06/20</u>	<u>05/15/20</u>	\$60,000	No
Draft Feasibility Report and EA	Type I IEPR	<u>04/06/20</u>	<u>05/29/20</u>	\$150,000	No
Draft Feasibility Report and EA	Policy and Legal Review	<u>04/06/20</u>	<u>5/15/20</u>	n/a	No
Final Feasibility Report and EA	District Quality Control	<u>10/13/20</u>	<u>11/02/20</u>	\$40,000	No
Final Feasibility Report and EA	Agency Technical Review	<u>11/24/20</u>	<u>1/18/21</u>	\$40,000	No
Final Feasibility Report and EA	Policy and Legal Review	<u>3/09/21</u>	<u>3/22/21</u>	n/a	No

Table 1: Levels of Review

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.

a. DISTRICT QUALITY CONTROL

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.
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 – Structural	A structural engineer with experience in levee design, construction, and maintenance.
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.

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).

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).

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.

b. AGENCY TECHNICAL REVIEW

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.
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; discussion of 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 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 – Structural	A structural engineer with experience in levee design, construction, and maintenance.
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.

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.

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)).

c. INDEPENDENT EXTERNAL PEER REVIEW

(i) 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.

Decision on Type I IEPR. As shown in Section 1 the only mandatory trigger in Section 11 of EC 1165-2-217 that is met is the possibility for a significant threat to human life. The study has no known deaths caused by flooding in the study area; however, this potential is being further evaluated. Structural solutions have the potential to increase the risk to life safety. Although the possibility of a transfer of risk is being evaluated, a Type I IEPR is planned and would include a Safety Assurance Review per EC 1165-2-217. The decision to complete an IEPR may be reconsidered after additional evaluation of alternatives.

Products to Undergo Type I IEPR. If required, the full draft report will undergo IEPR.

Required Type I IEPR Panel Expertise. Panels will consist of independent, recognized experts from outside of the USACE in disciplines representing a balance of areas of expertise suitable for the review being conducted. Table 4 lists the required panel expertise.

Table 4: Required Type I IEPR Panel Expertise

IEPR Panel Member Disciplines	Expertise Required
Economics	Experience in analysis of demographics, land use, and flood damage assessments discussion of other social effects (OSE) associated with flood risk; and economic justification of FRM projects in accordance with current USACE policy.
Environmental	Inland 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.

Engineering – Geotechnical	Extensive experience in geotechnical evaluation of flood risk management structures such as slope stability.
Cultural Resources	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.

Documentation of Type I IEPR. The OEO will submit a final Review Report no later than 60 days after the end of the draft report public comment period. USACE shall consider all recommendations in the Review Report and prepare a written response for all recommendations. The final decision document will summarize the Review Report and USACE response and will be posted on the internet.

Recommended Best Planning Practice: Begin coordination with the RMO very early in the study to allow adequate time for scoping and contracting for the Type I IEPR.

If a non-structural solution is determined to be the selected plan, then that mandatory trigger may no longer be met. Further, it would then meet the exclusion case outlined in section 11.4.4.1 of EC 1165-2-217, as discussed below and in Section 1. The project study:

- does not include an EIS
- has not been determined as controversial
- has no more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources
- has no substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures
- has, before implementation of mitigation measures, no more than a negligible adverse impact on a species listed as endangered or threatened species under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) or the critical habitat of such species designated under such Act.

Recommended Best Planning Practice: Follow the Type I IEPR SOP, Appendix C, for step-by-step guidance on how to seek an IEPR exclusion. A copy of the SOP is available on the Planning Community Toolbox at <https://planning.erd.c.dren.mil/toolbox/library/Misc/Type%20I%20IEPR%20SOP%20Final-2016.pdf>

(ii) Type II IEPR.

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.

Decision on Type II IEPR. A Type II IEPR will be needed on the final design of any structural alternative if selected, as it could impact life safety. If a non-structural plan is selected then a Type II IEPR will not be needed as there will only be a reduction in life safety risks.

d. MODEL CERTIFICATION OR APPROVAL

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.

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	Certified

	sales, etc.), and geographic capture rates. RECONS will be used to determine the RED benefits of the alternatives.	
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
HEC-LifeSim	Hec-LifeSim is an agent based simulation system for estimating life loss with the fundamental intent to simulate population redistribution during an evacuation. Life loss and economic damages are then determined by the hazard (e.g. flooding).	Undergoing Certification Process / Preferred Model for Dam and Levee Safety Risk Assessments Regarding Life Loss

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

Recommended Best Planning Practice: Hold an early coordination call (prior to the Alternatives Milestone) with the appropriate Planning Center(s) of Expertise to discuss model applications and any review needs for approval or certification of the planning models to be employed.

e. POLICY AND LEGAL REVIEW

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).

(i) 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.

- 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.
- 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.
- 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.

(ii) Legal Review.

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.

- 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.
- Each participating Office of Counsel will determine how to document legal review input.

ATTACHMENT 1: TEAM ROSTERS

PROJECT DELIVERY TEAM			
Name	Office	Position	Phone Number
[REDACTED]	SAM-PD-FP	Lead Plan Formulator	[REDACTED]
[REDACTED]	SAM-PD-FP	Plan Formulator (Intern)	[REDACTED]
[REDACTED]	SAM-PM-CM	Project Manager	[REDACTED]
[REDACTED]	SAM-OC	Office of Counsel	[REDACTED]
[REDACTED]	SAM-EN-HH	Project Engineer	[REDACTED]
[REDACTED]	SAM-EN-HH	Hydraulics & Hydrology	[REDACTED]
[REDACTED]	SAM-EN-HH	Hydraulics & Hydrology (Intern)	[REDACTED]
[REDACTED]	SAM-EN-GG	Geotechnical	[REDACTED]
[REDACTED]	SAM-PD-EI	Biologist	[REDACTED]
[REDACTED]	SAM-RE-P	Real Estate	[REDACTED]
[REDACTED]	SAM-PD-EI	Cultural Resources/OSE	[REDACTED]
[REDACTED]	SAM-EN-E	Cost Estimator	[REDACTED]
[REDACTED]	SAM-PD-FE	Economist	[REDACTED]
[REDACTED]	SAM-PD-FE	Economist (Intern)/OSE	[REDACTED]
[REDACTED]	IWR	Public Involvement/OSE	[REDACTED]

DISTRICT QUALITY CONTROL TEAM			
Name	Office	Position	Phone Number
[REDACTED]	SAM-PD-FP	Branch Chief of Plan Formulation	[REDACTED]
[REDACTED]	SAM-PM-C	Chief of Project Management	[REDACTED]
[REDACTED]	SAM-EN-H	Chief of Water Resources	[REDACTED]
[REDACTED]	SAM-EN-TC	Chief of Cost Engineering	[REDACTED]
[REDACTED]	SAM-EN-GG	Chief of Geotechnical	[REDACTED]
[REDACTED]	SAM-PD-EI	Chief of Environmental	[REDACTED]
[REDACTED]	SAM-RE	Real Estate	[REDACTED]
[REDACTED]	SAJ-PD-D	Chief Economist	[REDACTED]
[REDACTED]	SAM-PD-FP	Chief Plan Formulation Team	[REDACTED]

AGENCY TECHNICAL REVIEW TEAM (TBD)			
Name	Position	Office	Phone Number
TBD	ATR Lead	Team Lead	
TBD	Plan Formulation		
TBD	Environmental Resources		

TBD	Cultural Resources		
TBD	Hydrology & Hydraulics		
TBD	Geotechnical Engineering		
TBD	Economics		
TBD	Civil Design		
TBD	Cost Engineering MCX		
TBD	Real Estate/Lands		

VERTICAL TEAM <i>(Additional members TBD)</i>			
Name	Office	Position	Phone Number
[REDACTED]	SAD-PDP	Policy & Procedures	[REDACTED]
[REDACTED]	SAD-EN	Engineering & Construction	[REDACTED]
[REDACTED]	CESAD-HERD	Review Manager	[REDACTED]
[REDACTED]	CESAD-PDP	Planning Lead	[REDACTED]
[REDACTED]	CENAD-PD-PP	Economic	[REDACTED]
[REDACTED]	CECW-PC	Plan Formulation	[REDACTED]
[REDACTED]	CESAD-PDR	Real Estate	[REDACTED]
[REDACTED]	CECC-SAD	Counsel	[REDACTED]
[REDACTED]	CEMVP-EC-H	Hydraulics	[REDACTED]
[REDACTED]	FRM-PCX	Planning	[REDACTED]
[REDACTED]	SAD-RIT	Regional Communication	[REDACTED]

POLICY REVIEW TEAM (TBD)			
Name	Office	Position	Phone Number