



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, MISSISSIPPI VALLEY DIVISION
1400 WALNUT STREET
VICKSBURG, MS 39180-3262

CEMVD-PD

9 AUG 2019

MEMORANDUM FOR Commander, Memphis District

SUBJECT: Request for Approval of the Review Plan for the Memphis Metropolitan Stormwater-North Desoto County, Mississippi Feasibility Study

1. References:

- a. Memorandum, CEMVM-PM, 9 April 2019 subject as above (encl).
- b. EC 1165-2-217, Review Policy for Civil Works, 20 February 2018.

2. The enclosed Review Plan (RP) for the Memphis Metropolitan Stormwater-North Desoto County, Mississippi Feasibility Study has been prepared in accordance with EC 1165-2-217 and has been coordinated with MVD Staff and the FRM-PCX who concurred with the RP.

3. The MVD hereby approves this RP, which is subject to change as circumstances require, consistent with project development under the Project Delivery Business Process. Non-substantive changes to this RP do not require further approval. Substantive revisions to this RP or its execution will require new written approval from this office. The district should post the approved RP to its public website [if required], with sensitive information removed.

4. The MVD point of contact for this action is Sarah Palmer, CEMVD-PDM, (601) 634-5910.

BUILDING STRONG and Taking Care of People!

Encl

JAMES A. BODRON, P.E., SES
Director of Programs



DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT CORPS OF ENGINEERS
167 NORTH MAIN STREET B-202
MEMPHIS, TENNESSEE 38103-1894

CEMVM-PM

9 APR 2019

MEMORANDUM FOR Commander, Mississippi Valley Division (CEMVD-PDM/
Ms. Sarah Palmer)

SUBJECT: Request for Approval of the Review Plan for the Memphis Metropolitan
Stormwater-North DeSoto County, Mississippi Feasibility Study

1. References

- a. Memorandum, Review Plan Template Package, dated 31 July 2018
- b. Engineering Circular (EC) 1165-2-217, Review Policy for Civil Works, dated 20 February 2018
- c. Civil Works Director's Policy Memorandum, CW 2019-01, subject: Policy and Legal Compliance Review, dated 9 January 2019
- d. Memorandum, CESPDP-PDP (FRM-PCX), dated 11 March 2019 (ENCL 1)

2. This Memorandum transmits the Review Plan (ENCL 2) for Memphis Metropolitan Stormwater-North DeSoto County, Mississippi Feasibility Study for your review and approval. The subject Review Plan and Review Plan Checklist (ENCL 3) are based on the Review Plan Template Package Memorandum and EC 1165-2-217 referenced above.

3. Based on the requirements outlined in EC 1165-2-217, a Type I IEPR is anticipated to be required for this project.

4. The point of contact is Marsha Raus, Project Manager, (901) 544-3455.

MICHAEL A. ELLICOTT
COL. EN
Commanding

Encls

REVIEW PLAN

July 22, 2019

Project Name: Memphis Metropolitan Stormwater-North DeSoto County Feasibility Study, DeSoto County, Mississippi

P2 Number: 444806

Decision Document Type: Feasibility Report with Integrated Environmental Assessment

Project Type: Flood Risk Management

District: Memphis District

District Contact: PM: 901-544-3455; Planner: 601-631-7104

Major Subordinate Command (MSC): Mississippi Valley Division

MSC Contact: Planning Specialist: 601-634-5869

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

RMO Contact: Deputy Director: 415-503-6852; MVD POC; 314-331-8404

Key Review Plan Dates

Date of RMO Endorsement of Review Plan: Mar 11, 2019

Date of MSC Approval of Review Plan: Pending

Date of IEPR Exclusion Approval: N/A

Has the Review Plan changed since PCX Endorsement? Yes

Date of Last Review Plan Revision: Pending

Date of Review Plan Web Posting: Pending

Date of Congressional Notifications: Pending

Milestone Schedule

	<u>Scheduled</u>	<u>Actual</u>	<u>Complete</u>
<u>Alternatives Milestone:</u>	Jan 18, 2019	Jan 18, 2019	Yes
<u>Tentatively Selected Plan:</u>	Nov 15, 2019	TBD	No
<u>Release Draft Report to Public:</u>	Jan 10, 2020	TBD	No
<u>Agency Decision Milestone:</u>	May 15, 2020	TBD	No
<u>Final Report Transmittal:</u>	Mar 12, 2021	TBD	No
<u>Senior Leaders Briefing:</u>	Jun 15, 2021	TBD	No
<u>Chief's Report or Director's Report:</u>	Aug 15, 2021	TBD	No

Project Name: Memphis Metropolitan Stormwater-North DeSoto County Feasibility Study

Location: DeSoto County, Mississippi

Authority: The United States House of Representatives Committee on Transportation and Infrastructure adopted a resolution on March 7, 1996.

Memphis Metro Area, Tennessee and Mississippi

Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, That, the Secretary of the Army review the report of the Chief of Engineers on the Wolf River and Tributaries, Tennessee and Mississippi, published as House Document Numbered 76, Eighty-fifth Congress, and other pertinent reports, to determine whether any modifications of the recommendations contained therein are advisable at this time, with particular reference to the need for improvements for flood control, environmental restoration, water quality, and related purposes associated with storm water runoff and management in the metropolitan Memphis, Tennessee area and tributary basins including Shelby, Tipton, and Fayette Counties, Tennessee, and DeSoto and Marshall Counties, Mississippi. This area includes the Hatchie River, Loosahatchie River, Wolf River, Nonconnah Creek, Horn Lake Creek, and Coldwater River Basins. The review shall evaluate the effectiveness of existing Federal and non-Federal improvements, and determine the need for additional improvements to prevent flooding from storm water, to restore environmental resources, and to improve the quality of water entering the Mississippi River and its tributaries.

Sponsor: DeSoto County Board of Supervisors

Type of Study: The study will be a Flood Risk Management (FRM) Feasibility Study. The study is fully funded under FY 2018 Work Plan.

SMART Planning Status: This is a 3x3x3 compliant study (WRRDA 2014). Study will be compliant with USACE DCW Memorandum 2018-05 issued 3 May 2018.

Project Area: The authority covers a large area including six river basins, across five counties in two states. The area described in the budget fact sheets submitted in support of the new start describe the study area as follows: The study area lies in the Horn Lake Creek and Coldwater River watersheds in DeSoto County, MS including the cities of Horn Lake, Southaven, Olive Branch, Walls, and Hernando. Impacts from flooding occur in the following basins: Horn Lake Creek and tributaries, and Coldwater River. At this time, the most significant issues are believed to be in the northern part of the county, but the entire county and all tributary basins will be considered. Internal and public scoping will refine the study area.

The specific project areas have not been defined at this time.

There are no known, critical habitats, state parks, prime and unique farmlands or national parks, monuments or refuges in the study area. There are listed species that may occur in the general study area. Arkabutla Reservoir (USACE) lies along the southern portion of the county.

There are Indian mounds in the northwestern part of the study area and there is a likelihood of other cultural sites.

Opportunities for ecosystem restoration and recreation will be explored in conjunction with project features such as flood storage areas or channel modifications, as appropriate and feasible.

Interstate 55 bisects the area north to south and the I-69 corridor bisects it east to west. US Highways 51 and 61 also lie in the project area. Three major rail lines run north-south through the area. There are several large underground pipelines and an overhead TVA transmission line. The area lies approximately 2 miles south of the runways at Memphis International Airport.

Horn Lake Creek crosses into Tennessee before reentering Mississippi and flowing into the Mississippi River. The State of Tennessee and the City of Memphis may both have some regulatory control over some project features.

Problem Statement: Flooding and environmental degradation.

Major flood damage occurred in May 2010, May 2011, September 2014, and March 2016. The area received a Presidential Disaster Declaration in 2011. The U.S. Small Business Administration provided federal assistance after the 2014 flood. The US Coast Guard provided emergency evacuation assistance during the September 2014 event. Flooding inundates major transportation corridors and several neighborhoods, isolates communities, damages public infrastructure and development (residential, commercial and industrial), and threatens life safety. Unstable channels, lack of suitable riparian cover, altered flow regime, and loss of wetlands and floodplains all degrade habitat in the area. Repeated flooding occurs within the cities of Horn Lake, Southaven, and Olive Branch.

DeSoto County has the fastest growing population in the State of Mississippi (ranked 32 in the entire U.S.). Recent development has reduced floodplain and aquatic habitat. Most of the wetlands and bottomland hardwoods have been drained and developed. Increased runoff is causing channel instability, scouring and smothering aquatic habitat.

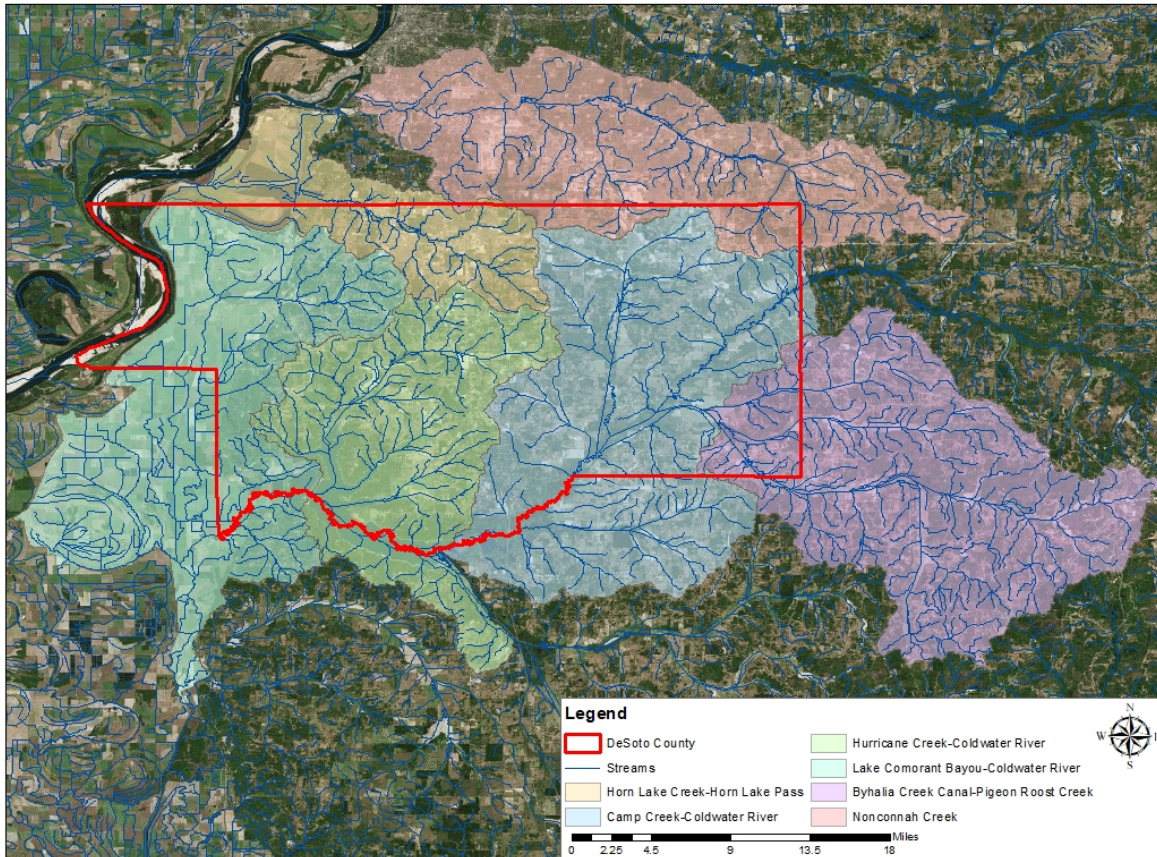
Federal Interest: This area has the fastest growing population in the State of Mississippi (ranked 32 in the entire U.S.) and has experienced repetitive flood events in May 2010, May 2011, September 2014, and March 2016.

Since 1994, three lives have been lost in DeSoto County due to flooding. The area received a Presidential Disaster Declaration in 2011 and flooding in September 2014 prompted a State of Emergency declaration. The Coast Guard responded to evacuate trapped residents, and the U.S. Small Business Administration provided federal assistance.

Risk Identification: DeSoto County has over 170,000 residents. Flooded roads put 20,000 – 30,000 people at risk during major rain events and limit access to emergency and medical services. Flooding inundates major transportation corridors and several neighborhoods, isolates communities, damages public infrastructure and development (residential, commercial and industrial), and threatens life safety. The water rises very quickly and roads become dangerously inundated before first responders can close them to prevent people from driving into deep water. There are numerous neighborhoods with ingress/egress routes that can be blocked for hours which prevent

ambulances, police and fire from reaching residents. Closed roads also interfere with school bus routes and extend the time students are on the bus up to 3 hours. Three deaths were attributed to flooding between 1994 and 2006.

DeSoto Study: 10 Digit HUC Basins and Streams Within Study Area



1. FACTORS AFFECTING THE LEVELS OF REVIEW

Scope of Review.

- Will the study likely be challenging? No. Public controversy is unlikely. The project is in an urban setting and there are few environmental concerns. There will be some challenges because much of the area is developed and there is little room for detention/retention, bypass, etc. The sponsor is capable and cooperative and is fully engaged in managing stakeholders.
- Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks. Some of the H&H and economic data is more than 15 years old and will need to be updated/validated throughout the course of the study. Much of the FIRM mapping in the county has been updated in the last 5-7 years and there is concern with the accuracy of the FIRM map as compared to future hydrodynamic modeling within the study. Increased development requires that the structural inventory and hydrology be updated and can result in more benefits. Measures/alternatives can change once this information is

available. The PDT contacted USFWS and EPA regarding the study and those agencies have no significant issues at this time.

- Is the project likely to be justified by life safety or is the study or project likely to involve significant life safety issues? Overall the project will be justified based on reduction of flood damages, however certain elements of the study may be justified by life safety concerns.
- Has the Governor of an affected state requested a peer review by independent experts? No
- Will it likely involve significant public dispute as to the project's size, nature, or effects? No, some members of the public may be disappointed that the proposed plan does not provide relief to localized issues.
- Is the project/study likely to involve significant public dispute as to the economic or environmental cost or benefit of the project? No. There have been previous studies and projects in the area and the public has not identified any concerns. The County is well funded and capital improvement projects meet with little opposition to the economic costs. Much of the area is urbanized and the streams are already degraded. The previous study, which did not result in construction, had no public opposition and no significant environmental impacts.
- 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? Not at this time. Previous studies in the area have identified traditional solutions to the flooding issues. PDT members have extensive experience in the area and do not foresee anything novel or innovative.
- Does the project design require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule? Not anticipated at this time.
- Is the estimated total cost of the project greater than \$200 million? Not likely.
- Will an Environmental Impact Statement be prepared as part of the study? No. An EA is anticipated at this time.
- Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources? No. Although there are Indian mounds in the northwestern part of the study area and there is a likelihood of other cultural sites, at this time it is not anticipated that they will be located within the project area. The most likely project area with construction features has been surveyed in the past and no significant resources were found. The project archaeologist is experienced in the area and has conducted a preliminary records search on the entire area and has found no indication of any unavoidable resources. Some of the likely project features would likely serve to stabilize degrading stream reaches; degrading reaches pose a greater threat to resources than the project would.

- Is the project expected to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures? No. The area is urbanized and the streams and habitats are degraded. Some mitigation may be required under USACE policy, but the impacts are unlikely to be “substantial” even without mitigation. In the past, USFWS has recommended any required mitigation be done in adjoining watersheds that provide more opportunity for sustainable habitat.
- 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? No. There is no designated critical habitat and the only species that may occur in the county are not likely to use the habitats associated with the streams.

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:

PDT Review. The PDT will review the completed products (Report Summary, Draft Report, Final Report) prior to DQC.

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.

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 will be performed. 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.

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
Report Summary prior to AMM	District Quality Control	12/21/18	01/11/19	\$0	Not Done
Existing Conditions and Focused Array	District Quality Control	07/29/19	08/02/19	\$10,000	No
Report Summary Prior to TSP	District Quality Control	10/15/19	11/01/19	\$5,000	No
Draft Feasibility Report and EA	District Quality Control	11/15/19	12/31/19	\$33,000	No
Draft Feasibility Report and EA	Agency Technical Review	01/10/20	03/07/20	\$50,000	No
Draft Feasibility Report and EA	Type I IEPR	01/10/20	03/07/20	\$100,000	No
Draft Feasibility Report and EA	Policy and Legal Review	01/10/20	03/10/20	n/a	No
Report Summary - ADM	District Quality Control	04/15/20	04/30/20	\$5,000	No
Final Feasibility Report and EA*	District Quality Control	10/01/20	12/31/20	\$29,000	No
Final Feasibility Report and EA *	Agency Technical Review	01/01/21	03/01/21	\$30,000	No
Final Feasibility Report and EA	Policy and Legal Review	03/12/21	04/10/21	n/a	No

**DQC and ATR of appendices will be done as they are completed and DQC of the final report will be done after all technical appendices have been reviewed.*

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 engineering, planning, economics, environmental resources, etc.).
Planning	A Water Resources Planner with 5 years of experience in urban Flood Risk Management Projects.
Economics	An economist with experience in Flood Risk Management Projects and the models used in the study (see Table 5).
Environmental Resources	Environmental Specialist with experience in FRM projects and habitat models to assess channel work, wetlands, bottomland hardwoods, and mitigation for impacts to these.
Cultural Resources	Cultural Resource Specialist with experience in historic properties, Native American sites, and programmatic agreements.
Hydrology/Hydraulic Engineering	Senior Engineer with experience in Flood Risk Management Projects including structural and non-structural alternatives and the models listed in Table 5.
Civil Design	Senior Engineer with experience in Flood Risk Management Projects to include detention/retention and channel modifications.
Geotechnical	Senior Engineer with experience in Flood Risk Management Projects to include detention/retention and channel modification.
Cost Engineering	The Cost Engineering panel member should have 15 years demonstrated experience or combined equivalent of education and experience assessing flood risk management features – channels, levees and detention/retention.
Construction/Operations	A Senior Construction Engineer with expertise managing construction of Flood Risk Management features such as berms, control structures, and channel modifications.
Real Estate	Senior Real Estate Specialist with experience in Flood Risk Management policy, urban land acquisition and appraisal, and LERRDS.

Quality Control and DQC. Quality Control should be performed continuously throughout the study. DQC reviewers will be embedded throughout document development by scheduled involvement at key decision points. DQC of Report Summaries, Draft Reports and Final Reports will be done in DrChecks and a specific certification of DQC completion is required. 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, on page 19 (see Figure F).

1. Documentation of Planning Quality Control Checks will be completed in accordance with the RPEDS SOP for DQC. Initial and continuous reviews are identified as “Quality Checks.” Other Divisions will document Quality Control Checks according to their standard practices. Quality Control Checks will be performed by senior level staff, such as supervisors and team leaders, but not individuals who have produced the original work or who managed or reviewed documents produced by outside contractors. Quality Checks evaluate assumptions, loadings, design parameters, constraints, equations, model inputs, quantities, and references used to complete the design and/or analysis. Thorough annotation, conclusions should be provided in an accompanying narrative to allow the reviewer/checker to assure their validity.
2. The conclusions resulting from Quality Checks should be annotated and provided in an accompanying narrative to allow the reviewer/checker to assure their validity.
3. Quality Control Checks will include but is not limited to the following team members: Plan Formulation, Environmental, Economics, Project Management, Counsel, Engineering and Real Estate Divisions.
4. The DQC process should integrate the Quality Management Plan, Quality Checks, and a detailed peer review/checking of all documents, computations, and graphics, etc. that are contained in a project report, including NEPA and other environmental compliance products and in-kind services provided by local sponsors.
5. The following DQC reviews are required for RPEDS produced decision documents to be submitted for culmination in a Chief's or Directors Report:
 - a. Existing Conditions DQC. This review will include plan formulation and environmental DQC team members, at a minimum. The purpose of this DQC is to review historic, existing, and future without project conditions, and problems, opportunities, goals and objectives. If the study purpose is navigation, then the team should include economics. The review will cover scoping and preliminary analysis. The plan formulation reviewer will compare the risks and consequences identified in the RP, PMP, and risk register to ensure that risks and consequences are being considered, and if they need to be, revised appropriately and are being addressed. A Quality Control check can be included for OC, engineering and economics if beneficial. This will generally be conducted 45 days following the Alternatives Milestone.
 - b. Focused Array DQC. This review will include plan formulation, economics and environmental. The review will consider measures, screening criteria, and the initial and focused array of alternatives. It will also review model selections and incorporation of risk and uncertainty details among other actions identified. The reviewers will compare the risks and consequences identified in the RP, PMP, and risk register. This will generally be conducted 45 days following the Alternatives Milestone.

- c. Draft Report/TSP DQC. Will include reviews by the PDT and OC, as well as the entire DQC team as identified in the Review Plan. The review will cover all plan formulation issues being presented in the draft report, including risk informed approaches as documented in the respective checklist. It will be conducted and stored in the DQC folders on the RPEDS SharePoint, and the MFR produced will be in the form of a Review Report, complete with documentation and resolution of DQC comments for use by an ATR Team, as applicable, and a DQC certification form accompanied by the complete set of checklists. The plan formulation reviewer will compare the risks and consequences identified in the RP, PMP, and risk register to ensure that risks and consequences are being considered, and if they need to be, revised appropriately and are being addressed. If a TSP risk assessment is identified in the RP and PMP, or if a risk buy-down plan is identified in the planning process, the plan formulation reviewer will assure it was conducted and addressed and documented correctly in the report. This will generally be conducted 30 days following the TSP milestone.
- d. Final Report DQC. Similar to the Draft Report DQC, the review will include the full gamut of considerations ranging from PDT and OC review to formal DrChecks comments made by the entire DQC Team. A Review Report will be prepared as the MFR for use by subsequent ATR and IEPR reviews, in conjunction with a completed set of checklists. This will generally be conducted 30 days prior to submission to MVD.

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. Missing or inadequate DQC documentation can result in delays to the start of other reviews (see EC 1165-2-217, section 9).

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).
Planning	An ATR-approved Senior or Certified, Planner with experience in urban FRM projects.
Economics	A senior economist with experience in Flood Risk Management Projects, life safety models, structural and non-structural measures.

Environmental Resources	Senior Environmental Specialist with experience in FRM projects. This includes experience in urban flooding, habitat models to assess channel work, wetlands, bottomland hardwoods and appropriate mitigation measures.
Cultural Resources	Senior Cultural Resource Specialist with experience in historic properties, Native American sites, and programmatic agreements.
Hydrology and Hydraulic Engineering	Senior Engineer with experience in Flood Risk Management Projects including structural and non-structural alternatives and the models listed in Table 6.
Civil Design	Senior Engineer with experience in Flood Risk Management Projects to include detention/retention and channel modifications.
Geotechnical	Senior Engineer with experience in Flood Risk Management Projects included detention/retention and channel modification.
Cost Engineering	The Cost Engineering panel member should have demonstrated experience in flood risk management features including detention/retention, channels, levees, etc... Understanding and experience in USACE processes, contracting acquisition procedures, estimating software (MCACES) and cost regulations (such as ER1110-1-1300, ER1110-2-1302, ETL1110-2-573) is required.
Real Estate	Senior Real Estate Specialist with experience in Flood Risk Management to include policy considerations, urban land acquisition and appraisal, and LERRDS.
Climate Preparedness and Resilience CoP Reviewer	A member of the Climate Preparedness and Resiliency Community of Practice (CoP) certified to perform ATR for Flood Risk Management projects..
Risk and Uncertainty	For decision documents involving hydrologic, hydraulic, and/or coastal related risk management measures, include a subject matter expert in multi-discipline flood risk analysis to ensure consistent and appropriate identification, analysis, and written communication of risk and uncertainty.

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. All members of the ATR team should use the four part comment structure (see EC 1165-2-217, section 9(k)(1)). 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. The project will undergo Type I IEPR. Although there are no expected environmental or public issues, the project is intended to reduce risks to life safety.

Products to Undergo Type I IEPR. 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	The economics reviewer should be experienced in economic evaluation of flood risk management projects. Familiarity with HEC-FDA, HEC-FIA and LifeSim or equivalent models is required. Panel member will have a Master's degree or higher education from a university with an accredited program in the discipline of economics and/or specific work experience of 20 + years in the discipline. Panel members will be familiar with the USACE Civil Works process, policies and procedures.
Environmental	Senior Environmental Specialist with experience in urban FRM projects. Panel member will have a master's degree or higher education in biology or a related field and work experience of 20 + years in the discipline. Panel member will have knowledge and experience with National Environmental Policy Act (NEPA) processes and mitigation analysis.
Engineering	Senior H&H Engineer with experience in FRM projects. The panel member shall hold a professional license in civil engineering with a focus on water resources with a MS degree or higher in civil engineering and/or a minimum of 20 years of hydraulic modeling and design

	experience and experience with multi-million dollar, flood risk management projects.
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Documentation of Type I IEPR. The Outside Eligible Organization (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.

(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. Type II IEPR is anticipated, however a final decision will be made at a later date.

Products to Undergo Type II IEPR. TBD

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.

Table 5: Planning Models. The following models may be used to develop the decision document:

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Certification / Approval
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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
HGM-Hydrogeomorphic Method*	To determine impacts of detention sites, borrow pits or other clearing in potential wetlands and calculate mitigation.	Pending Certification for MRL SEIS
HSI Barred Owl*	This model can be used to assess changes to mixed woodland boreal forest, mixed transitional forest, and deciduous forests.	Approved
HSI Black-capped Chickadee*	This model can be used to assess changes to general forest habitats – deciduous and evergreen.	Approved
HSI Bigmouth Buffalo*	This model can be used to assess changes to larger rivers, overflow ponds, lowland lakes and oxbows, marshes, bayous and sloughs. It is useful for assessing habitat in natural turbid systems.	Approved
HSI Bluegill*	This model can be used to assess habitat changes in lentic environments and low velocity streams. It is useful for assessing habitats with low to moderate turbidity.	Approved
HSI Bullfrog*	This model is designed to examine habitat in slow-moving water and along the shoreline.	Approved
HSI Fox Squirrel*	This model would be used to assess habitat changes in mature oak-hickory forests with cavity trees.	Approved
HSI Mink*	This model is sensitive to the differences in habitat quality between channelized stream segments and natural stream segments	Approved
HSI Pileated Woodpecker*	This model would capture changes to both coniferous and deciduous forests with mature, dense, productive stands.	Approved
HSI Slough Darter*	The model is designed to examine habitat changes in the channel including: %pools, gradient, substrate and velocity. The anticipated alternatives could have impacts on all of these. The model also examines water quality parameters which would not likely change as a result of the project.	Approved
HSI Wood Duck*	The wood duck model would be used to assess changes to creeks, rivers, floodplain lakes, swamps, and beaver ponds.	Approved
IWR-Planning Suite II	The IWR-Plan was developed by the Institute of Water Resources as accounting software to compare habitat benefits Among alternatives. This model will be used to determine best buy alternatives and incremental cost analysis of alternatives.	Certified
LifeSim 1.0.1	The program integrates hydrologic engineering, economic analysis, and social behavior to compute the potential for loss of life in the study area. Quantifying	Enterprise Life Safety Model

	loss of life can help inform various alternatives about life safety through a risk-based analysis. If certified, it would be used to assess the impacts of features which are intended to reduce life safety risks.	
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*These models are likely, but have not been confirmed with the ECOPCX to ensure appropriateness. This will be done after a focused array of alternatives is developed and proposed actions identified.

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.

Table 6: Engineering Models. These models may be used to develop the decision document:

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

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.

3. OPTIONAL – FUTURE REVIEWS

To be determined after a Recommended Plan is selected.