

Tennessee-Tombigbee Waterway (Tenn-Tom Waterway or TTWW) and Black Warrior-Tombigbee Waterway (BWT) Navigation Improvement Study Review Plan

Prepared: July 2022

1. Project Summary

Project Name: Tennessee-Tombigbee Waterway (Tenn-Tom Waterway or TTWW) and Black Warrior-Tombigbee Waterway (BWT) Navigation Improvement Study

Location: Mississippi-Alabama

P2 Number: 485386

Decision Document Type: Feasibility Report and Supplemental Environmental Impact Statement

Project Business Line: Inland Navigation

Congressional Authorization Required: Yes

Project Purpose(s): Single-Purpose Navigation

Non-Federal Sponsor: None. This project is located on the inland waterway system, the study is funded with 100 percent Federal funds [Section 102, WRDA 1986 (P.L. 99-662)], and there is no non-Federal sponsor requirement.

Points of Contact for Questions/Comments on Review Plan

District: Mobile District (SAM)

District Contacts:

Project Manager (251-690-2607) i

Plan Formulation Branch Chief (251-690-3143)

Lead Plan Formulator (251-694-3832)

Major Subordinate Command (MSC): South Atlantic Division

MSC Contact: Biologist and Tribal Liaison (404-562-5202)

Review Management Organization (RMO): Planning Center of Expertise for Inland Navigation

RMO Contact: Senior Planner with PCX (304-226-1159)

Milestones and Other Key Dates

Date of RMO Endorsement of Review Plan	<i>31 October 2022</i>
Date of MSC Approval of Review Plan	<i>23 January 2023</i>
Date of IEPR Exclusion Approval	None
Has the Review Plan changed since RMO Endorsement?	No
Date of Last Review Plan Revision	None
Date of Review Plan Web Posting	Pending
Date of Congressional Notifications	Pending

Milestone Schedule and Other Dates

	Scheduled	Actual	Complete
Receipt of Funds	<i>03 May 2022</i>	<i>03 May 2022</i>	<i>Yes</i>
Alternatives Milestone	<i>03 August 2022</i>	<i>03 August 2022</i>	<i>Yes</i>
Tentatively Selected Plan	<i>07 June 2027</i>		<i>No</i>
Release Draft Report to Public	<i>06 August 2027</i>		<i>No</i>
Agency Decision Milestone	<i>11 January 2028</i>		<i>No</i>
Final Report Transmittal	<i>27 June 2028</i>		<i>No</i>
Chief’s Report	<i>07 December 2028</i>		<i>No</i>

2. References

Engineer Regulation 1165-2-217 – Water Resources Policies and Authorities – Civil Works Review Policy, 1 May 2021.

Engineer Circular 1105-2-412 – Planning – Assuring Quality of Planning Models, 31 March 2011.

Office of Management and Budget, Final Information Quality Bulletin for Peer Review, Federal Register Vol. 70, No. 10, January 14, 2005, pp 2664-2677.

3. Review Execution Plan

This section describes each level of review to be conducted. The RMO is the designated USACE organization overseeing the quality reviews by reviewing and endorsing the Review Plan (RP). In addition, the RMO manages the review efforts for Agency Technical Review (ATR), Independent External Peer Review (IEPR), or Safety Assurance Review (SAR). All review team members, except for District Quality Control (DQC), will be conducted by experts outside SAM who are not associated with the work being reviewed. This helps ensure independent review as required by law or USACE policy. The designated RMO will consult with appropriate allied functional offices (e.g., engineering,

and real estate), relevant centers of expertise (CX)s, and other offices, as needed, to help ensure that review teams with appropriate independence and expertise are assembled to accomplish cohesive and comprehensive reviews. This study will undergo the following types of reviews:

District Quality Control. All decision documents and accompanying components (including data, analyses, environmental compliance documents, planning documents, draft report, and final Chief's report will undergo District Quality Control (DQC). DQC begins with a discipline peer review of all products developed. This level of DQC will be overseen and managed by the individual discipline's supervisory chain or discipline leads. The second level of DQC is PDT review of all decision documents and accompanying components. The PDT review is responsibility of the Project Manager, Planning Lead and Engineering Technical Lead. The third level of DQC is the official DQC review documented in the DQC report. This level of DQC is the responsibility of the PM and identified DQC Team Lead. This comprehensive internal review process covers basic science and engineering work products. It fulfils the project quality requirements of the Project Management Plan. DQC of engineering, environmental, and economic models will occur once modeling of the Future Without Project Condition (FWOP) models have been completed. DQC of all decision documents and accompanying components will occur following the TSP milestone on draft documentation and again following the ADM milestone on final documentation.

Agency Technical Review. All decision documents and accompanying components (including data, analyses, environmental compliance documents, planning documents, draft report, and final Chief's report will undergo Agency Technical Review (ATR). ATR will be performed by a qualified team from outside the Mobile 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. ATR will occur at two points. A full ATR review of all engineering, environmental and economic decision documents and accompanying components will occur following DQC review, the TSP milestone on draft documentation, and again following the ADM milestone on final documentation.

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. The RMO will manage the ATR. The review will be 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 ER 1165-2-217, Chapter 5.5.3). Table 2 identifies the disciplines and required expertise for this ATR Team.

Cost Engineering Review. All decision documents will be coordinated with the Cost Engineering Mandatory Center of Expertise (MCX). The MCX assisted in determining the expertise needed on the ATR team. The MCX will provide the Cost Engineering certification. The RMO is responsible for coordinating with the MCX for the reviews. These reviews 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. The PCXIN will review any planning models needing certification and will supply documentation supporting the use of the tool(s) in the study.

Policy and Legal Review. All decision documents will be reviewed for compliance with law and policy. ER 1105-2-100, Appendix H, and Director’s Policy Memorandum 2019-01, both provide 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.

Independent External Peer Review. Section 2034 of the Water Resources Development Act (WRDA) of 2007 (P.L. 10-114), as amended (33 U.S.C. 2343), includes requirements for review by external experts. The Act requires independent peer review, known as IEPR, of project decision documents under certain conditions. These conditions, as well as exclusion criteria, are outlined in ER 1165-2-217.

Table 1 provides the schedules and costs for reviews. The specific expertise required for the review teams are identified in Table 2.

Table 1: Schedule and Costs of Reviews

Product(s) to undergo Review	Review Level	Site Visit	Start Date	End Date	Cost	Complete
<i>Planning Model Review</i>	<i>Model Review (see EC 1105-2-412)</i>	<i>No</i>	<i>06 July 2027</i>	<i>19 July 2027</i>	<i>\$</i>	<i>N/A</i>
<i>Draft Feasibility Report / EA or EIS</i>	<i>District Quality Control</i>	<i>No</i>	<i>20 July 2027</i>	<i>16 August 2027</i>	<i>\$45,000</i>	<i>No</i>
<i>Draft Feasibility Report / EA or EIS</i>	<i>Agency Technical Review</i>	<i>No</i>	<i>17 August 2027</i>	<i>11 October 2027</i>	<i>\$60,000</i>	<i>No</i>
<i>Draft Feasibility Report / EA or EIS</i>	<i>Independent External Peer Review</i>	<i>No</i>	<i>17 August 2027</i>	<i>11 October 2027</i>	<i>\$200,000</i>	<i>No</i>
<i>Draft Feasibility Report / EA or EIS</i>	<i>Policy and Legal Review</i>	<i>No</i>	<i>17 August 2027</i>	<i>11 October 2027</i>	<i>N/A</i>	<i>No</i>
<i>Final Feasibility Report / EA or EIS</i>	<i>District Quality Control</i>	<i>N/A</i>	<i>09 February 2028</i>	<i>14 March 2028</i>	<i>\$40,000</i>	<i>No</i>

<i>Final Feasibility Report / EA or EIS</i>	<i>Agency Technical Review</i>	<i>N/A</i>	<i>05 April 2028</i>	<i>16 May 2028</i>	<i>\$50,000</i>	<i>No</i>
<i>Final Feasibility Report / EA or EIS</i>	<i>Policy and Legal Review</i>	<i>N/A</i>	<i>05 April 2028</i>	<i>16 May 2028</i>	<i>N/A</i>	<i>No</i>

Table 2: Review Teams - Roles and Expertise

Review Team Role	Expertise	DQC	ATR	IEPR
Review Team Lead	A senior professional with extensive experience preparing Civil Works decision documents and conducting technical reviews. The lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc.).	Yes	No	No
Planning	A senior water resources planner with experience in Section 216, review of completed projects and Inland navigation planning. May be combined with another discipline.	Yes	Yes	Yes
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. Specifically, a specialist with experience with studies requiring an EIS. May be combined with Cultural Resources.	Yes	Yes	Yes
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.	Yes	Yes	Yes

Hydrology	A hydrologist with familiarity of inland hydrology climate change assessment and experience in HEC-HMS and associated one and/or two-dimensional models, floodplain delineation, risk, and uncertainty analysis, and several other closely associated technical subjects. The hydrologic reviewer could also serve as the hydraulic reviewer	Yes	Yes	Yes
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, dam, and levee safety, and several other closely associated technical subjects. The hydraulic reviewer could also serve as the hydrology reviewer.	Yes	Yes	Yes
Engineering – Geotechnical	A geotechnical engineer with experience with levee and riverbank stabilization design, construction, and maintenance.	Yes	Yes	Yes
Engineering – Structural	A structural engineer with experience in dam and levee design, construction, and maintenance.	Yes	Yes	Yes
Cost Engineering	A cost engineer with experience using required cost estimation software; working knowledge of construction and ecosystem restoration; capable of making professional determinations based on experience.	Yes	Yes	Yes
Construction/Operations	A Civil/Mechanical engineer with experience in operating and maintaining navigation projects and hydropower projects, to include maintaining navigation channels, lock operations, spillway operations, hydropower operations, and asset management.	Yes	Yes	Yes
Real Estate	A real estate specialist with experience in development of Real	Yes	Yes	Yes

	Estate Plans in accordance with Chap. 12, ER 405-1-12, 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 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.	Yes	Yes	Yes

Documentation of Review

Documentation of DQC. Quality Control will be performed continuously. A specific certification of DQC completion will be prepared at the draft and final report stages. Documentation of DQC will follow the District Quality Manual and the MSC Quality Management Plan. Dr. Checks will be used for documentation of DQC comments. An example DQC Certification statement is provided in ER 1165-2-217, Appendix D. Documentation of completed DQC will be provided to the MSC, RMO and ATR Team leader. Documentation will be made available to the ATR Team prior to their review. The team will examine DQC records and comment in the ATR report on the adequacy of the DQC effort.

Documentation of ATR. Dr. Checks 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 will use the four-part comment structure (see ER 1165-2-217, Chapter 5). If a concern cannot be resolved by the ATR team and PDT, it will be elevated to the vertical team to resolve using the issue resolution process in ER 1165-2-217, chapter 5.9. Concerns will be closed in Dr. Checks by noting the concern has been elevated. The ATR Lead will prepare a Statement of Technical Review (see ER 1165-2-217, chapter 5.11, and Appendix D), for the draft and final reports, certifying that review issues have been resolved or elevated. ATR will be certified when all concerns are resolved or referred to the vertical team and the ATR documentation is complete.

Documentation of IEPR. IEPR is managed outside of the USACE and conducted on studies. 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 evaluation of environmental impacts of proposed projects, or biological opinions of the project study.

The Outside Eligible Organization 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.

Independent External Peer Review Determination.

The criteria for when to conduct IEPR is described in ER1165-2-217. The three mandatory conditions determining whether IEPR is undertaken are as follows:

(1) When the estimated total cost of the project, including mitigation costs, is greater than \$200 million.

(2) When the Governor of an affected State requests a peer review by independent experts.

(3) 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.

This project is scoped to include an EIS and it is likely that estimated total cost of the project will exceed \$200 million in total; therefore, an IEPR is warranted.

4. Supporting Information

Study or Project Background

On 02 May 2019, the Tennessee-Tombigbee Waterway Development Authority submitted a letter to the U.S. Senate expressing interest in a feasibility study for the river systems as a connected hydrological system for navigation. In March 2020, an Initial Appraisal was completed by the Mobile District, identifying there is Federal interest in investigating modifications to the existing navigable waterway for improvements to efficiency of the navigation services provided, navigation safety and the reduction of maintenance costs of the navigation channels. On 3 May 2022, funding was provided to initiate a study of the TTWW and BWT navigation systems.

Study Authority

Authority for this study is Section 216 of the Flood Control Act of 1970 (P.L. 91-611, as amended), which is the following:

The Secretary of the Army, acting through the Chief of Engineers, is authorized to review the operation of projects, the construction of which

has been completed and which were constructed by the Corps of Engineers in the interest of navigation, flood control, water supply, and related purposes, when found advisable due significantly changed physical or economic conditions, and to report thereon to Congress with recommendations on the advisability of modifying the structures or their operation, and for improving the quality of the environment in the overall public interest.

Identified Congressional Resolution that authorized the study: *WRDA 2020 as submitted by The Tennessee-Tombigbee Waterway Development Authority*



MEMORANDUM

Administrator
Mr. Mitchell B. Mays

Chairman
Governor Matthew G. Bevin

Vice Chairman
Mr. Kenny C. Imes

Treasurer
Mr. T. L. Phillips

MEMBERS

State of Alabama
Governor Kay Ivey
Alternate: Mr. Baker Allen
Mr. Horace Horn
Mr. James Lewis
Mrs. Anna Laurie McKibbens
Mrs. Martha Stokes
Mr. Donald G. Waldon

State of Kentucky
Governor Matt Bevin
Alternate: Mr. Keith Riley
Lt. Gov. Jenean Hampton
Alternate: Mr. Kenny Imes
Ms. Carol Gault
Mr. Romy Holmes
Mr. Jerry Pace
Mr. Brian Roy

State of Mississippi
Governor Phil Bryant
Alternate: Mr. Bobby Harper
Mr. Nick P. Ardillo, Jr.
Mr. Bill Cleveland
Mr. Robert Dexter
Mr. T.L. "Bud" Phillips
Mr. Dale Pierce

State of Tennessee
Governor Bill Lee
Alternate: Mr. Jason Rich
Mr. John Bennett
Mrs. Cathy Holland
Mrs. Marty Mabry
Mr. Toks Omishakin

Business Manager
Mrs. Agnes Zajontz

TO: United States Senate Environment & Public Works Committee
Subcommittee on Transportation and Infrastructure
United States House Transportation & Infrastructure Committee
Subcommittee on Water Resources & Environment

FROM: The Tennessee-Tombigbee Waterway Development Authority

DATE: 02 May 2019

SUBJECT: A proposed feasibility study of navigation on the Tennessee-Tombigbee Waterway and the connecting Warrior Tombigbee Waterway

The Tennessee-Tombigbee Waterway Development Authority (the Authority) supports and proposes that a feasibility study to improve navigation on the Tennessee-Tombigbee Waterway and the connecting Warrior Tombigbee Waterway should be undertaken by the US Army Corps of Engineers. It is the sense of the Authority that this feasibility study should be authorized in any potential 2020 Water Resources Development Act (WRDA).

The Authority hereby submits this proposed language for the 2020 WRDA: "The Committee directs the Corps of Engineers to conduct a feasibility study, at full federal expense, of the Tennessee-Tombigbee Waterway and the connecting Warrior Tombigbee Waterway, as a system, to determine what modifications, including channel deepening, that are needed to improve commercial navigation on these two waterways."

Respectfully submitted,


Mitchell B. Mays

Project Area

The Tennessee-Tombigbee Waterway, Mississippi and Alabama (TTWW) joins the Tennessee River in Northeast Mississippi with the Tombigbee River near Amory, Mississippi. The waterway includes approximately 234 miles of man-made waterway extending from the Tennessee River downstream to its confluence with the Black Warrior-Tombigbee (BWT) Waterway near Demopolis, Alabama. The system features 10 lakes and 10 locks and dams, which allow for a shorter navigational route from the interior United States to the Gulf of Mexico.

The river section of the waterway stretches upstream from Demopolis, Alabama north to Amory, Mississippi and encompasses 149 miles and four locks and dams along the 9' x 300' navigation channel. The canal section of the Tennessee-Tombigbee Waterway stretches along the 12' x 300' navigation channel north from Amory, Mississippi upstream to Jamie L. Whitten Lock and Dam near Dennis, Mississippi. Forty-six miles in length, it has a total of five locks and dams. The divide section of the Tennessee-Tombigbee Waterway begins at Jamie L. Whitten Lock and Dam and runs upstream and northward for 39 miles along the 12' x 280' navigation channel to Yellow Creek on Pickwick Lake near the Tennessee border.

The 457-mile-long BWT with 6 locks and dams provides commercial navigation, hydropower, and recreational opportunities. The river system's ultimate destination is a confluence with the Gulf of Mexico in Mobile, Alabama.

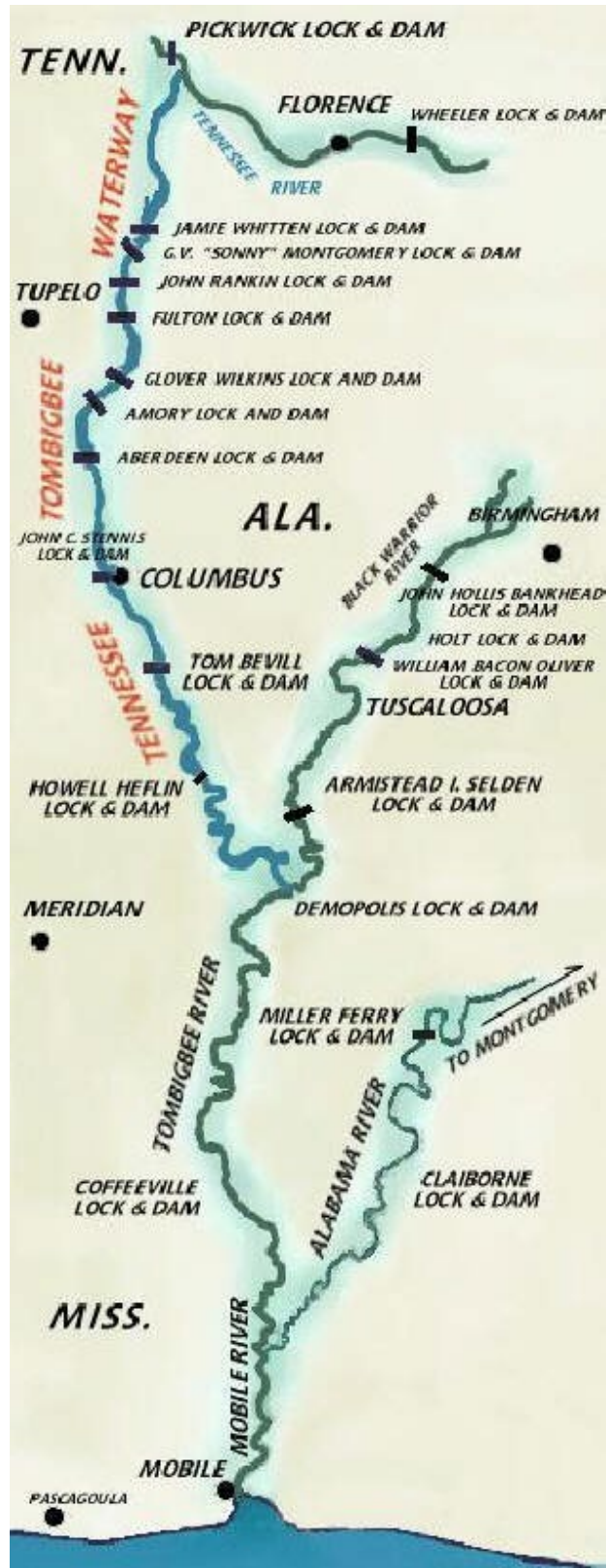


Figure 1 - Tenn-Tom Waterway System Location Map (tenntom.org)

Problem Statement

The TTWW and BWT is responsible for \$1.5 billion to \$3 billion in trade in Tennessee, Mississippi, and Alabama each year, and contributes to positive indirect economic impacts on local economies. Several countries have traded with the Tennessee River Basin Region via the TTBWW. In addition, the system is providing flood protection, hydropower, and recreation benefits.

Since the construction of both waterways, sediment entering the waterways has required periodic O&M activities to remove shoals that develop. This activity can have an impact on usage of the waterways and possibly cause temporary closures. The need for these O&M activities and the occurrence of temporary closures appear to be increasing. Additionally, users have noted that assuring consistency of channel depth would allow them to more fully utilize the capacity of their barges. The authorized depths through the system are inconsistent with the TTWW having both 9-foot and 12-foot authorized depths and BWT authorized depth being only 9-foot.





Figures 2 & 3. Severe rain events can result in significant shoaling on the Tombigbee Waterway

Types of Measures/Alternatives Being Considered

Based on project objectives and constraints, the PDT identified the following measures for consideration in alternative development and analysis:

- Deepening (including sill replacement)
- Sediment Control (bank stabilization, increasing advanced maintenance, in-stream sediment control structures, sediment traps)
- Channel Improvements (bend easings, cutoffs)
- Upstream Erosion Control

In conjunction with any alternatives, segmented reaches would be evaluated in each waterway (TTWW to its confluence with the BWT and the BWT to the Gulf of Mexico) to assess system-wide impacts.

Estimated Cost/Range of Costs

Based on the foregoing, the PDT considered the estimated costs of the possible alternatives. The specifics of each measure or resulting alternatives have not yet been quantified but a rough estimate for project implementation ranges between \$100M and \$500M.

Models to be Used in the Study

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 following models may be used to develop the decision document:

Table 3: Planning Models.

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Certification / Approval
National Investment Model (NIM)	One time	Certification Expired – One time approval needed
TranSight Model	The model calculates impacts to employment, output, demographics, and other social variable in the region of interest.	Approval For Use - Pending

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. These models may be used to develop the decision document:

Table 4: Engineering Models.

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Approval Status
HEC-RAS 6.2 (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

<p>HEC-HMS 4.10 (Hydraulic Modeling System)</p>	<p>The Hydrologic Modeling System (HEC-HMS) is designed to simulate the complete hydrologic processes of dendritic watershed systems. The software includes many traditional hydrologic analysis procedures such as event infiltration, unit hydrographs, and hydrologic routing. HEC-HMS also includes procedures necessary for continuous simulation including evapo-transpiration, snowmelt, and soil moisture accounting.</p>	<p>HH&C CoP Preferred model</p>
<p>HEC-ResSim 3.3 (Reservoir Simulation)</p>	<p>The Reservoir System Simulation (HEC-ResSim) software developed by the U.S. Army Corps of Engineers, Institute for Water Resources, Hydrologic Engineering Center (CEIWR-HEC) is used to model reservoir operations at one or more reservoirs for a variety of operational goals and constraints. The software simulates reservoir operations for flood management, low flow augmentation and water supply for planning studies, detailed reservoir regulation plan investigations, and real-time decision support. HEC-ResSim can represent both large- and small-scale reservoirs and reservoir systems through a network of elements (junctions, routing reaches, diversions, reservoirs) that the user builds. The software can simulate single events or a full period-of-record using available time-steps. HEC-ResSim is a decision support tool that meets the needs of modelers performing reservoir project studies as well as meeting the needs of reservoir regulators during real-time events.</p>	<p>HH&C CoP Preferred model</p>

Factors Affecting Level and Scope of Review

Level and Scope of Review.

Will the study likely be challenging?

Yes, it is anticipated that study will likely be challenging. The study covers a large area and involves analyzing and screening of alternatives along a large stretch of land along the river and will cover multiple specific project locations. The study area is also part of a regulated and managed river system of lock and dam structures where any changes made to any section of the river could possibly have impacts on the operations of other projects upstream. There are also many interest groups and users within and near the study area that will likely have feedback on the Recommended Plan to be taken into consideration. Additionally, the number of impacted species is diverse and selecting an alternative to accommodate the needs of all or most species adds to the challenges.

- Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks. There are a number of project risks associated with this study that could affect the ability to successfully implement project improvements. For engineering, there is a medium risk associated with the sill elevation at three dams, and a medium risk associated with the availability and capacity of placement sites. If under keel analysis indicates that the existing sills need to be lowered this would increase study costs for needed analyses at the affected locks. Lowering the sills would also likely be cost prohibitive and would adversely affect project economics. For Economics the chief risks are (1) whether there will be sufficient benefits from the alternatives to support the levels of investment under consideration, which is interrelated with (2) the uncertainty around what the future traffic demand might be with and without investment, and (3) whether the risks created by shoaling (i.e., frequency and duration) will be characterized in way that is sufficient for feasibility-level economics and plan formulation. These economic risks are considered to have a medium risk of occurring. For Environmental, there is considered to be a medium risk associated with obtaining an accurate assessment of impacts or mitigation needs for the threatened and endangered species (30+) along the waterways. Cultural resources, determination of resources that may be affected by implementation of the project and coordination and mitigation to avoid those impacts is also considered a medium risk to the project.
- Is the project likely to be justified by life safety or is the study or project likely to involve significant life safety issues? Life safety is not anticipated to be a significant issue on this study.
- 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? No, the anticipated project design will not be based on novel methods, involve innovative materials or techniques or present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices. The methods, measures, and alternatives to be analyzed and screened are all widely used and proven for improving commercial waterway navigation, locks, and dams.

- Does the project design require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule? No, the project design is not expected to require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule.
- Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources? The impact to tribal cultural and historic resources is not yet fully understood. However, significant tribal resources are known to be in the study area. The level of impact will be better understood once the tentatively selected plan has been identified and the locations of dredging and construction relative to known resources are known.
- Is the project expected to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures? Dredging and the construction of measures to reduce shoaling are expected to have some adverse impact on fish and wildlife species and their habitat during construction. The level of impact will be better understood once the tentatively selected plan has been identified and the locations of dredging and construction relative to habitat are known.
- 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? Dredging and the construction of measures to reduce shoaling are expected to have some adverse impact on critical habitat during construction. The level of impact will be better understood once the tentatively selected plan has been identified and the locations of dredging and construction relative to habitat is known.

Risk Informed Decisions on Level and Scope of Review

Targeted ATR. Will a targeted ATR be conducted for the study? At this time, it is anticipated that based on the information in the previous section, the use of a targeted ATR is not required.

IEPR Decision. The mandatory decision regarding conducting an IEPR for this project was based on the criteria in ER 1165-2-217. As this project includes generation of an EIS and is anticipated to cost over \$200 million, an IEPR is warranted.

Appendix A - Brief Description of Each Type of Review

This section describes each level of review to be conducted. Based upon the factors discussed in Section 4, this study will undergo the following types of reviews:

District Quality Control. All decision documents and accompanying components (including data, analyses, environmental compliance documents, planning documents, draft report, and final Chief's report) will undergo DQC. DQC begins with a discipline peer review of all products developed. This level of DQC will be overseen and managed by the individual discipline's supervisory chain or discipline leads. The second level of DQC is PDT review of all decision documents and accompanying components. The PDT review is the responsibility of the Project Manager, Planning Lead and Engineering Technical Lead. The third level of DQC is the official DQC review documented in the DQC report. This level of DQC is the responsibility of the PM and identified DQC Team Lead. This comprehensive internal review process covers basic science and engineering work products. It fulfills the project quality requirements of the Project Management Plan. DQC of engineering, environmental, and economic models will occur once modeling of the Future Without Project Condition (FWOP) models have been completed. DQC of all decision documents and accompanying components will occur following the TSP milestone on draft documentation and again following the ADM milestone on final documentation.

Agency Technical Review. All decision documents and accompanying components (including data, analyses, environmental compliance documents, planning documents, draft report, and final Chief's report) will undergo Agency Technical Review (ATR). ATR will be performed by a qualified team from outside the Mobile 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. ATR will occur at two points. A full ATR review of all engineering, environmental and economic decision documents and accompanying components will occur following DQC review, the TSP milestone on draft documentation, and again following the ADM milestone on final documentation.

Independent External Peer Review. IEPR is required for this decision document. 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. Certain criteria dictate mandatory performance of IEPR and other considerations may lead to a discretionary decision to perform IEPR. For this study, the information in Section 3 – Mandatory Decision on Conducting IEPR – dictated the decision to conduct an IEPR.

Cost Engineering Review. All decision documents will be coordinated with the Cost Engineering Mandatory Center of Expertise (MCX). The MCX assisted 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 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, and Director's Policy Memorandum 2019-01, both provide 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.

(i) Policy Review.

The policy review team will be selected 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 may 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 will be documented in a Memorandum for the Record (MFR) produced for each engagement with the team. The MFR will be distributed to all meeting participants.
- In addition, teams may choose to capture 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 will 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 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 member will determine how to document legal review input.

Public Review. The District will post the Review Plan and approval memo on the District internet site after removing appendices as appropriate (e.g., Appendix B, Team Rosters). Public comment on the adequacy of the Review Plans will be accepted and considered. Additional public review will occur when the report and environmental compliance document(s) are released for public and agency comment.

Appendix B – Team Rosters

Appendix C – Cost of Reviews – Backup Information

Appendix D – Sensitive Information

Appendix E – Review Plan Change Log

Revision Date	Description of Change	Page / Paragraph Number

List of Acronyms and Abbreviations

Acronym or Abbreviation	Name or Term
ATR	Agency Technical Review
BWT	Black Warrior-Tombigbee Waterway
CX	Center of Expertise
DQC	District Quality Control
EC	Engineer Circular
ER	Engineer Regulation
FWOP	Future Without Project
HEC	Hydrologic Engineering Center
IEPR	Independent External Peer Review
MCX	Mandatory Center of Expertise
MFR	Memorandum for Record
MSC	Major Subordinate Command
NIM	National Investment Model
OEO	Outside Eligible Organization
RMO	Review Management Organization
RP	Review Plan
SAM	Mobile District
SAR	Safety Assurance Review
TTWW	Tennessee-Tombigbee Waterway
USACE	U.S. Army Corps of Engineers
WRDA	Water Resources Development Act