



DEPARTMENT OF THE ARMY
US ARMY ENGINEER DIVISION, SOUTHWESTERN
1100 COMMERCE STREET, SUITE 831
DALLAS TX 75242-1317

REPLY TO
ATTENTION OF

CESWD-PDS-P (1105)

21 JAN 2010

MEMORANDUM FOR Commander, Fort Worth District

SUBJECT: Review Plan for Aquilla Lake Storage Reallocation Feasibility Study, Aquilla Lake, TX

1. References:

- a. EC 1105-2-410, 22 August 2008, Review of Decision Documents.
- b. Memorandum, CECW-CP, 30 March 2007, subject: Peer Review Process.
- c. Addendum to Reference 1.b., CECW-CP, September 2008, subject: Supplemental Information for the Peer Review Process.

2. The review plan for the subject study, enclosed, has been reviewed and cleared for approval by the Water Management and Reallocation Studies Planning Center of Expertise. It has been prepared in accordance with the referenced guidance, and public comments received will be incorporated into the plan as the study progresses. It does not require Independent External Peer Review.

3. I hereby approve this review plan, which is subject to change as study circumstances require, consistent with study development under the Project Management Business Process. Subsequent substantial revisions to this plan or its execution will require new written approval from this office.

4. If you have questions or need further information, please contact Jo Ann M. Duman, CESWD-PDS-P, at (469) 487-7065.

Encl

A handwritten signature in black ink, appearing to read "Anthony C. Funkhouser".

ANTHONY C. FUNKHOUSER
Colonel, EN
Commanding

CF:
CESWF-PE (Newman)

REVIEW PLAN

**Brazos River Basin Systems Assessment
Interim Feasibility Study
Phase II**

**Aquilla Lake Storage Reallocation
Fort Worth District**

Revised January 15, 2010



**US Army Corps
of Engineers®**

REVIEW PLAN

**Brazos Systems Assessment - Interim Feasibility Study
Brazos River Basin
Phase II, Aquilla Lake Storage Reallocation**

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1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope and level of peer review for the Aquilla Lake Storage Reallocation Feasibility Study

b. References

- (1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 01 July 2009
- (2) EC 1105-2-410, Review of Decision Documents, 22 Aug 2008
- (3) EC 1105-2-407, Planning Models Improvement Program: Model Certification, 31 May 2005
- (4) Engineering Regulation (ER) 1110-2-12, Quality Management, 30 Sep 2006
- (5) Project Management Plan for Aquilla Lake Storage Reallocation Feasibility Study, 21 April 2008
- (6) FSCA, Supplemental Agreement, 2 December 2005

c. **Requirements.** This review plan was developed in accordance with EC 1105-2-410, which establishes the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision documents through independent review. The EC outlines three levels of review: District Quality Control, Agency Technical Review, and Independent External Peer Review. In addition to these three levels of review, decision documents are subject to policy and legal compliance review and, if applicable, safety assurance review and model certification/approval.

- (1) District Quality Control (DQC). DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). It is managed in the home district and may be conducted by staff in the home district as long as they are not doing the work involved in the study, including contracted work that is being reviewed. Basic quality control tools include a Quality Management Plan providing for seamless review, quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc. Additionally, the PDT is responsible for a complete reading of the report to assure the overall integrity of the report, technical appendices and the recommendations before approval by the District Commander. The Major Subordinate Command (MSC)/District quality management plans address the conduct and documentation of this fundamental level of review; DQC is not addressed further in this review plan.
- (2) Agency Technical Review (ATR). ATR is an in-depth review, managed within USACE, and conducted by a qualified team outside of the home district that is not involved in the day-to-day production of the project/product. The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. The ATR team reviews the various work products and assure that all the parts fit together in a coherent whole. ATR teams will be comprised of senior USACE personnel (Regional Technical Specialists (RTS), etc.), and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the home MSC.
- (3) Independent External Peer Review (IEPR). IEPR is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. IEPR is generally for feasibility and reevaluation studies and modification reports with Environmental Impact Statements (EISs). IEPR is managed by an outside eligible organization (OEO) that is described in Internal Revenue Code Section 501(c) (3), is exempt

from Federal tax under section 501(a), of the Internal Revenue Code of 1986; is independent; is free from conflicts of interest; does not carry out or advocate for or against Federal water resources projects; and has experience in establishing and administering IEPR panels. The scope of review will address all the underlying planning, engineering, including safety assurance, economics, and environmental analyses performed, not just one aspect of the project.

- (4) Policy and Legal Compliance Review. Decision documents will be reviewed throughout the study process for their compliance with law and policy. These reviews culminate in Washington-level determinations that the recommendations in the reports and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the Chief of Engineers. Guidance for policy and legal compliance reviews is addressed further in Appendix H, ER 1105-2-100, Planning Guidance Notebook. When policy and/or legal concerns arise during DQC or ATR that are not readily and mutually resolved by the PDT and the reviewers, the District will seek issue resolution support from the MSC and HQUSACE in accordance with the procedures outlined in Appendix H, ER 1105-2-100. IEPR teams are not expected to be knowledgeable of Army and administration policies, nor are they expected to address such concerns. The home district Office of Counsel is responsible for the legal review of each decision document and signing a certification of legal sufficiency.
- (5) Safety Assurance Review. In accordance with Section 2035 of Water Resources Development Act (WRDA) of 2007, EC 1105-2-410 requires that all projects addressing flooding or storm damage reduction undergo a safety assurance review of the design and construction activities prior to initiation of physical construction and periodically thereafter until construction activities are completed on a regular schedule sufficient to inform the Chief of Engineers on the adequacy, appropriateness, and acceptability of the design and construction activities for the purpose of assuring public health, safety, and welfare. A future circular will provide a more comprehensive Civil Works Review Policy that will address the review process for the entire life cycle of a Civil Works project. That document will address the requirements for a safety assurance review for the Pre-Construction Engineering Phase, the Construction Phase, and the Operations Phase. The decision document phase is the initial design phase; therefore, ER 1105-2-410 requires that safety assurance factors be considered in all reviews for decision document phase studies. At this time, a Safety Assurance Review is not required for this project, but due to issues related to dam safety concerns, it could be possible to incorporate a Safety Assurance Review to assist the District in resolving existing dam safety concerns so that a pool raise could be implemented.
- (6) Model Certification/Approval. EC 1105-2-407 requires certification (for Corps models) or approval (for non-Corps models) of planning models used for all planning activities. The EC defines planning models as any models and analytical tools that planners use 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 EC does not cover engineering models used in planning. Engineering software is being address under the Engineering and Construction (E&C) Science and Engineering Technology (SET) initiative. Until an appropriate process that documents the quality of commonly used engineering software is developed through the SET initiative, engineering activities in support of planning studies shall proceed as in the past. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed.

2. STUDY INFORMATION

- a. **Decision Document.** The purpose of this interim feasibility study is to perform detailed investigation of the reallocation of storage within Aquilla Lake in the Brazos River basin and prepare an Integrated Interim Feasibility Report and Environmental Assessment that meets the requirements of ER 1105-2-100. The project is a General Investigations and the feasibility phase is cost shared 50/50 with the project's non-federal sponsor. If this decision document is approved by the Chief of Engineers, it should fall into the Chief of Engineer's discretionary authority for approval and should not require Congressional authorization.
- b. **Study Description.** The Aquilla Lake Storage Reallocation Study is one part of the overall Brazos Systems Assessment that is focusing on optimizing water supply through reallocation studies, overall operations of reservoirs within the Brazos Basin and measures that could mitigate downstream impacts if some of the potential optimization measures were ever implemented. The Aquilla Lake Storage Reallocation Study is very limited in scope and is only exploring reallocation measures in Aquilla Lake. This peer review plan is being developed for the Aquilla Lake Storage Reallocation Study. The non-Federal sponsor for this study is the Brazos River Authority (BRA). The BRA has executed contracts for all of the existing, available water supply in Aquilla Lake. The BRA and the approved Texas State Water Plan have identified a need for additional water supply in the area that is serviced by Aquilla Lake.

The study area will encompass the floodplain surrounding Aquilla Lake, upstream of Aquilla on Aquilla and Hackberry Creeks as far as necessary to develop enveloping curves, and downstream of Aquilla Dam on Aquilla Creek to the confluence with the Brazos River. Aquilla Lake, which is located in Hill County, became operational in 1982. The Lake has a surface area of approximately 3,164 acres at conservation pool. Aquilla Lake has a total flood pool capacity of 94,634 acre-feet of water and conservation storage of 45,235 acre-feet. The project was built to provide flood control, water supply and recreation.

The Aquilla Lake Storage Reallocation Study will be a typical U.S. Army Corps of Engineers (Corps) feasibility study. As such, existing baseline conditions will be identified (hydrology, hydraulics, economic flood damages, socioeconomic, dam safety, geotechnical, geology, environmental resources, cultural resources, and public desires), to sufficient level of detail to allow for feasibility level evaluation of selected alternative storage reallocation plans.

The Middle Brazos Systems Assessment, Phase II - Aquilla Lake Storage Reallocation Study costs are estimated to reach upwards of \$2.1 million. However, implementation costs are expected to greatly increase the total project cost. These costs likely would include, but are not be limited to, relocation of utilities, roads and recreation facilities; mitigation for adverse impacts to environmental and cultural resources; structural improvements or modifications to the dam or structures, and associated needed real estate acquisition. The estimated total project cost of this project is expected to range from \$5 to \$15 million.

The Corps currently plans to evaluate the existing condition and three pool raise alternatives (2.5, 4.5, and 6.5 feet). The three pool raise alternatives would entail reallocating current flood storage waters to the conservation storage thus increasing the amount of water available for future municipal and industrial water use. The Corps elected to limit these investigations to three alternatives given the preliminary findings indicate only insignificant amounts of firm yield would be achieved above a 4.5-foot pool raise. If it is determined that there is sufficient available firm yield within the range of pool raises to be investigated and no significant impacts are identified to the authorized purposes of

Aquilla Lake, the BRA would have to apply for and receive a water rights permit from Texas Commission on Environmental Quality (TCEQ) before a pool raise would occur.

Current USACE policy requires that dam safety must be considered in all decisions involving water supply. For projects with safety issues or concerns such that the consequences of failure are considered to be of moderate to high risk, reallocations of storage that would require raising the conservation pool are not allowed. An initial evaluation of Aquilla Lake Dam undertaken in 2008 identified dam safety concerns that currently prohibit the implementation of the proposed reallocation alternatives, should they be recommended. Current policy does not; however, prohibit the completion of a reallocation study recommending a pool raise. Should the completed study find that a reallocation from the flood control pool to conservation storage for water supply is in the public interest, then the study recommendation would be tabled until such time as the dam safety concerns were reduced to a level of low risk.

While there are established programs to identify and correct dam safety concerns, the funding and timing of these measures is based on national priorities for the entire portfolio of dams. The District is currently proposing to implement measures to potentially correct the dam safety concerns. However, a final determination on the resolution of the dam safety concerns will not be made until completion of the Initial Evaluation Studies and assessments of project pool experiences demonstrate the measures reduce the risk at all pool conditions. Therefore, proceeding with the study at this time assumes the risk of potentially recommending a reallocation that cannot be implemented. Both the District and BRA are aware of this situation and have determined that the study is important to the completion of the Brazos River Basin System Assessment and it is in both agencies' interest to proceed with the study at this time. Should a recommendation for reallocation be approved and tabled, at such time in the future as the dam safety concerns are mitigated to a low risk level, a re-evaluation of the study recommendations would be required before the reallocation could be implemented.

There will be district quality control (DQC) and Agency Technical Review (ATR) for this project. Review of submittal packages and feasibility report materials will be required prior to the following major milestones:

- Alternative Formulation Briefing (AFB)
- Draft Feasibility Report
- Final Feasibility Report

The timing and scope of these reviews is discussed in the following sections of this PRP.

- c. **Factors Affecting the Scope and Level of Review.** This study does not contain influential scientific information or assessment, nor is there apparent economic, environmental or social affects to the nation. Interagency interest is limited to the coordination required by federal law. As noted earlier, the Dam Safety concerns are currently being addressed by the Dam Safety Program and before any reallocation could be implemented, the existing dam safety concerns at Aquilla would have to be alleviated. Currently, a recommended project has not been identified for this study; however, the total project cost is estimated to be well under \$45 million (\$5-15 million). The study is currently under preliminary investigation of alternatives if project costs escalate above \$45 million this Peer Review Plan will be revised to include conducting IEPR. Close coordination with the sponsor and public meetings are expected to negate significant public dispute with regard to a recommended plan as are coordination with USFWS and USGS and cultural/archeological interests. Methods and models used in this study are typical of all Corps flood risk management studies with little room for interpretation and are not expected to change prevailing practices on this or future flood risk

management studies. If necessary, IEPR will occur prior to drafting the final report, before the Civil Works Review Board and State and Agency Review of the Final Feasibility Report and may occur earlier in the study process as needed.

- d. **In-Kind Contributions.** The sponsor will provide project management and Hydrology and Hydraulic analysis to the study for an in kind credit of \$150,000. These products will be reviewed by the PDT as required by the SWD Quality Assurance Plan and Corps policy and guidance.

3. AGENCY TECHNICAL REVIEW (ATR)

- a. **General.** ATR for decision documents covered by EC 1105-2-410 are managed by the appropriate Planning Center of Expertise (PCX) with appropriate consultation with the allied Communities of Practice such as engineering and real estate. The ATR shall ensure that the product is consistent with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and the results in a reasonably clear manner for the public and decision makers. Members of the ATR team will be from outside the home district. The ATR lead will be from outside the home MSC and is responsible for indentifying the ATR team members. ATR team members may be nominated from the home district. The leader of the ATR team will participate in milestone conferences and the Civil Works Review Board (CWRB) to address review concerns.
- b. **Products for Review.** ATR will occur prior to major decision points in the planning process so that the technical results can be relied upon in setting the course for further study. An in-depth review of the report and all appendices will be coordinated and documented by the PDT leader prior to HQUSACE policy compliance review. As mentioned throughout the PMP, all ATR will be coordinated with the Planning Center of Expertise for Water Management and Reallocation Studies (PCX). The ATR will be accomplished by an independent entity outside the Fort Worth District, within USACE, as designated by the PCX. The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices of all project decision documents. The intent is for an ATR to not only ensure technical analyses are correct, but also ensure compliance with all pertinent USACE guidance in or to high quality products early in the study prior to HQUSACE review. ATR will be completed on the following documentation:

- AFB Documentation
- Draft Feasibility Report
- Final Feasibility Report

Additional Issue Resolution Conferences (IRCs) may be required throughout the study when significant policy issues arise. If these require documentation for major decision making, then additional ATR of this documentation may be required; however, no IRCs are expected at this time. This quality control will occur prior to the decision event so that a firm technical basis for making decisions will be established. As a result, the decision event is free to address critical outstanding issues and set the direction for the next step of the study.

- c. **Required ATR Team Expertise.** The expertise and disciplines represented on the ATR team reflect the significant disciplines involved in the planning effort. The ATR team consists of at least 10 team members outside of the Fort Worth District in the following functional areas:

Plan Formulation: Team member should possess extensive experience in the Corps planning process and be knowledgeable of Corps policies and guidelines. He or she should be familiar

with flood risk management projects, water resources and watershed planning and have experience relevant to issues associated with perched banks and flat topography.

Hydrology and Hydraulics: Team member should be a recognized expert in the field of hydrology and hydraulics, have a thorough understanding of perched spillways.

Civil Design: Team member will have experience with utility relocations and positive closure requirements. A licensed/registered professional engineer is strongly recommended.

Structural Design: Team member will have a thorough understanding of Dams and structural measures to include, but not be limited to, retaining walls, gate structures, bridges and culverts, utility penetrations, and stop log and sandbag gaps. A licensed/registered professional engineer is strongly recommended.

Geotechnical: Team member will have extensive experience in perched spillways, seepage and Dam design, pre- and post-construction evaluation, and rehabilitation. A licensed/registered professional engineer is strongly recommended.

Cost Estimating: Team member will be familiar with cost estimating for similar projects in MCACES. Review includes construction schedules and contingencies for any document requiring Congressional authorization. The team member will be a Certified Cost Technician, a Certified Cost Consultant, or a Certified Cost Engineer. As the Cost Engineering Center of Expertise, Walla Walla District will assign this team member as part of a separate effort coordinated by the ATR or IEPR team lead in conjunction with the geographic district's project manager.

Economics: Team member will have extensive knowledge and experience in conducting flood risk management studies and a thorough understanding of HEC-FDA.

Cultural, Environmental, Real Estate, HTRW, and Recreation: Team members will be familiar with similar studies and projects.

Legal review is the responsibility of the Corps of Engineers, Office of Counsel and is not under the purview of the ATR team.

d. Documentation of ATR. DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

- (1) The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;
- (2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not been properly followed;
- (3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and
- (4) The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in or to then assess whether further specific concerns may exist. The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical coordination, and lastly the agreed upon resolution. The ATR team will prepare a Review Report which includes a summary of each unresolved issue; each unresolved issue will be raised to the vertical team for resolution. Review Reports will be considered an integral part of the ATR documentation and shall:

- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions; and
- Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

ATR may be certified when all ATR concerns are either resolved or referred to HQUSACE for resolution and the ATR documentation is complete. Certification of ATR should be completed, based on work reviewed to date, for the AFB, draft report, and final report. A sample certification is included in ER 1110-2-12.

4. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

- a. General.** IEPR is conducted for decision documents if there is a vertical team decision (involving the district, MSC, PCX, and HQUSACE members) that the covered subject matter meets certain criteria (described in EC 1105-2-410) where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside the USACE is warranted. IEPR is coordinated by the appropriate PCX and managed by an Eligible Outside Organization (OEO) external to the USACE. IEPR panels shall evaluate whether the interpretations of analysis and conclusions based on analysis are reasonable. To provide effective review, in terms of both usefulness of results and credibility, the review panels should be given the flexibility to bring important issues to the attention of decision makers; however, review panels should be instructed to not make a recommendation on whether a particular alternative should be implemented, as the Chief of Engineers is ultimately responsible for the final decision on a planning or reoperations study. IEPR panels will accomplish a concurrent review that covers the entire decision document and will address all the underlying engineering, economics, and environmental work, not just one aspect of the study. Whenever feasible and appropriate, the office producing the document shall make the draft decision document available to the public for comment at the same time it is submitted for review (or during the review process) and sponsor a public meeting where oral presentations on scientific issues can be made to the reviewers by interested members of the public. An IEPR panel or OEO representative will participate in the CWRB.
- b. Decision on IEPR.** It is not expected that IEPR will be required for this study. This study does not contain influential scientific information or assessment, nor does it have significant economic, environmental or social affects to the nation. Interagency interest is limited to the coordination required by federal law. No significant safety issues have been presented in relation to this study or are expected in relation to any recommended project. There is not currently a recommended project for this study however the cost is estimated to be under \$45 million. It is expected an Environmental Assessment will be the required NEPA documentation. Close coordination with the sponsor and public meetings are expected to negate significant public dispute with regard to a recommended plan

as are coordination with USFWS and EPA and cultural/archeological interests. Methods and models used in this study are typical of all Corps water reallocation studies with little room for interpretation and are not expected to change prevailing practices on this or future flood water reallocation studies. If necessary, IEPR will occur after a final report is prepared, but before the Civil Works Review Board and State and Agency Review of the Final Feasibility Report.

- c. **Products for Review.** Not Applicable.
- d. **Required IEPR Panel Expertise.** Not Applicable.
- e. **Documentation of IEPR.** Not Applicable.

5. MODEL CERTIFICATION AND APPROVAL

- a. **General.** The use of certified or approved models for all planning activities is required by EC 1105-2-407. This policy is applicable to all planning models currently in use, models under development and new models. The appropriate PCX will be responsible for model certification/approval. The goal of certification/approval is to establish that planning products are theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. The use of a certified or approved model does not constitute technical review of the planning product. Independent review of the selection and application of the model and the input data and results is still required through conduct of DQC, ATR, and, if appropriate, IEPR. Independent review is applicable to all models, not just planning models. Both the planning models (including the certification/approval status of each model) and engineering models used in the development of the decision document are described below:
- b. **Planning Models.** The following planning models are anticipated to be used:

- HEC-FDA 1.2.4 (Certified). The Hydrologic Engineering Center's Flood Damage Reduction Analysis (HEC-FDA) program provides the capability for integrated hydrologic engineering and economic analysis for formulating and evaluating flood risk management plans using risk-based analysis methods. The program will be used to evaluate and compare the future without- and with-project plans in Aquilla Lake to aid in the selection of a recommended plan to manage flood risk.
- The United States Fish and Wildlife Service Habitat Evaluation Procedure (HEP) (USFWS, 1980) (certified) was used to evaluate habitat conditions that would result from alternative plans. A habitat suitability index (HSI) for indicator species is derived by aggregating suitability indices (SIs) critical for habitat variables. These SIs are based on field measurements for existing conditions and on professional judgment for future conditions under alternative plans. The index ranges from 0.0 to 1.0, with 1.0 representing the highest habitat quality possible. A habitat unit (HU) is the product of the HSI multiplied by an area (acre) of available habitat. HSIs and HUs were developed for different times during the period of analysis (at year 1, 15, 25, and 50), and HUs are annualized to estimate an average annual habitat unit (AAHU).

In this system, future habitat conditions can be estimated for both baseline (without project) and design (with project) conditions. Projected long-term effects of the project can be predicted using Average Annual Habitat Unit (AAHU) values. Based on the AAHU outcomes, alternative designs can be formulated and trade-off analyses can be simulated to promote environmental optimization. AAHUs are determined by multiplying the HSI by the number of acres in the study

area, and therefore, HEP provides information for two general types of wildlife habitat comparisons. The first is the relative value of different areas at the same point in time. The second is the relative value of the same area at future points. Therefore, the impact of land and water use changes on wildlife habitat can be estimated.

The USFWS, with assistance from the Texas Parks and Wildlife Department (TPWD) and the USACE Fort Worth District, completed the HEP for the without-project (existing and future) condition of riparian natural resources. Because the resource agencies are most concerned in the restoration of lost aquatic and riparian habitat functions, the focus was to use models that contain variables that measure important components of riparian corridor structure. The team decided it was appropriate to measure the existing habitat value of the current vegetation state, even though the restoration measures were for converting or restoring existing vegetation to riparian woodlands. The following species, indicative of healthy ecosystems within the Aquilla Watershed, were used for the habitat evaluations.

- Riparian Woodland: Barred Owl, Carolina Chickadee, Raccoon, Wood Duck, Fox Squirrel, Downy Woodpecker
- Upland Forest: Barred Owl, Carolina Chickadee, Raccoon, Fox Squirrel, Downy Woodpecker
- Herbaceous Wetland: Raccoon, Wood Duck, Green Heron
- Grassland: American Kestrel, Eastern Cottontail, Eastern Meadowlark
- Deciduous Shrubland: Eastern Cottontail, Scissor-tailed Flycatcher, Racer, Northern Bobwhite
- Savanna: American Kestrel, Fox Squirrel, Eastern Cottontail, Scissor-tailed Flycatcher, Eastern Meadowlark

While these species are relatively common, their HSI models, when averaged cumulatively, serve as good indicators of a healthy, functioning ecosystem and therefore provide a good basis for comparing outputs from alternatives plans. However, they should not be used to judge the importance or significance of these habitats as discussed in the Introduction.

c. Engineering Models. The following engineering models are anticipated to be used:

- HEC-RAS 4.0. The Hydrologic Engineering Center's River Analysis System (HEC-RAS) program provides the capability to perform one-dimensional steady and unsteady flow river hydraulics calculations. The program will be used for steady flow analysis to evaluate the future without- and with-project conditions in Aquilla Lake watershed.
- HEC-HMS 2.2.2. The Hydrologic Engineering Center's Hydrologic Modeling System (HEC-HMS) simulates precipitation-runoff processes. Version 2.2.2 was chosen over the newer version, 3.3, for its efficiency and reliability in modeling the terrain present in the Aquilla Lake watershed.
- RiverWare 5.1. The Corps of Engineer's water management system, RiverWare 5.1, is designed to be used to model reservoir operations at one or more reservoirs whose operations are defined by a variety of operational goals and constraints. The program will be used for reservoir simulation to evaluate future conditions in Aquilla Lake with or without the proposed project.

6. REVIEW SCHEDULES AND COSTS

- a. **ATR Schedule and Cost.** ATR will be completed prior to submission of documentation to the vertical team for a decision. ATR costs for the AFB and draft feasibility report are currently estimated to be \$35,000. These costs are cost-shared with the study's non-federal sponsors. ATR will be completed on the following documentation:

- FSM, completed 11 December 2007
- AFB Documentation, anticipated February 2010
- Draft Feasibility Report, anticipated November 2010
- Final Feasibility Report, anticipated April 2011

- b. **IEPR Schedule and Cost.** Not Applicable

- c. **Model Certification/Approval Schedule and Cost.** All planning models anticipated for use in this study have been previously certified.

7. PUBLIC PARTICIPATION

The public will be able to comment on the feasibility study throughout the decision making process. Several public meetings will be held throughout the study. A public workshop will be held during the development of alternatives, which will be held after the FSM and prior to the AFB. In addition, after a tentatively selected plan is selected, a public meeting will be held to solicit public comment on the plan. Finally, a public meeting is normally held during the public review process of the draft feasibility report.

The public will have an opportunity to review and provide comments on the draft feasibility report and environmental assessment for 30 days occurring approximately November 2010. In addition, the public can provide comments to the Study Project Manager throughout the feasibility study process to the study's project manager at the following address:

U.S. Army Corps of Engineers, Fort Worth District
ATTN: Aquilla Lake Project Manager, CESWF-PM-C
P.O. Box 17300
Fort Worth, TX, 76102-0300

Comments and responses are documented by the date the comment was received, and provided as an attachment which follows the document from the first ATR in February 2010 through Washington D.C. level review of the final feasibility report expected April 2011. This includes comments from all ATRs and comments received from the public throughout the study process.

All published reports can be found at the Fort Worth District's website (www.swf.usace.army.mil) as well as directions for obtaining any information that may be disclosed under the Freedom of Information Act (Public Law 89-554, 80 Stat. 383; amended 1996, 2002, 2007).

8. PCX COORDINATION

Review plans for decision documents and supporting analyses outlined in EC 1105-2-410 are coordinated with the appropriate Planning Center(s) of Expertise (PCXs) based on the primary purpose of the basic decision document to be reviewed. The lead PCX for this study is the Water Management and

Reallocation Studies (WMRS) PCX at South West Division in Dallas, TX. Additionally, the WMRS PCX will coordinate with the Cost Engineering Directory of Expertise (DX) to conduct ATR of cost estimates, construction schedules and contingencies.

9. MSC APPROVAL

The MSC that oversees the home district is responsible for approving the review plan. Approval is provided the MSC Commander. The commander's approval should reflect vertical team input (involving district, MSC, PCX, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the PMP, the RP is a living document and may change as the study progresses. Changes to the RP should be approved by following the process used for initially approving the RP. In all cases the MSCs will review the decision on the level of review and any changes made in updates to the project.

10. REVIEW PLAN POINTS OF CONTACT

Questions and/or comments on this review plan can be directed to the following points of contact:

- U.S. Army Corps of Engineers, Fort Worth District
ATTN: Aquilla Lake Project Manager, CESWF-PM-C
P.O. Box 17300
Fort Worth, TX. 76102
- U.S. Army Corps of Engineers, Southwestern Division
ATTN: Chief of Planning & Policy Division, CESWD-PDS-P
1100 Commerce St.
Dallas, TX. 75242

**AQUILLA LAKE STORAGE REALLOCATION
FEASIBILITY STUDY**

STATEMENT OF AGENCY TECHNICAL REVIEW

**COMPLETION OF AGENCY TECHNICAL REVIEW
AQUILLA LAKE STORAGE REALLOCATION FEASIBILITY STUDY**

The Fort Worth District has completed the feasibility report of the Aquilla Lake Storage Reallocation Project. Notice is hereby given that an Agency technical review, that is appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the review plan.

During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions; methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level obtained; and reasonableness of the result, including whether the product meets the customer's needs consistent with law and existing Corps policy. The independent technical review was accomplished by an Agency team composed of staff from multiple districts. All comments resulting from ITR have been resolved.

(Signature) _____

Name
Agency Technical Review Team Leader
Aquilla Lake Project

_____ Date

(Signature) _____

Rob Newman
Project Manager
Aquilla Lake Project

_____ Date

ATTACHMENT 3: ACRONYMS AND ABBREVIATIONS

<u>Term</u>	<u>Definition</u>	<u>Term</u>	<u>Definition</u>
AFB	Alternative Formulation Briefing	NED	National Economic Development
ASA(CW)	Assistant Secretary of the Army for Civil Works	NER	National Ecosystem Restoration
ATR	Agency Technical Review	NEPA	National Environmental Policy Act
CSDR	Coastal Storm Damage Reduction	O&M	Operation and maintenance
DPR	Detailed Project Report	OMB	Office and Management and Budget
DQC	District Quality Control	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DX	Directory of Expertise	OEO	Outside Eligible Organization
EA	Environmental Assessment	OSE	Other Social Effects
EC	Engineer Circular	PCX	Planning Center of Expertise
EIS	Environmental Impact Statement	PDT	Project Delivery Team
EO	Executive Order	PAC	Post Authorization Change
ER	Ecosystem Restoration	PMP	Project Management Plan
FDR	Flood Damage Reduction	PL	Public Law
FEMA	Federal Emergency Management Agency	QMP	Quality Management Plan
FRM	Flood Risk Management	QA	Quality Assurance
FSM	Feasibility Scoping Meeting	QC	Quality Control
GRR	General Reevaluation Report	RED	Regional Economic Development
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RTS	Regional Technical Specialist
IEPR	Independent External Peer Review	USACE	U.S. Army Corps of Engineers
ITR	Independent Technical Review	WRDA	Water Resources Development Act
LRR	Limited Reevaluation Report		
MSC	Major Subordinate Command		