DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SOUTHWESTERN DIVISION
1100 COMMERCE STREET
DALLAS, TX 75242-1317

CESWD-PDP 21 JUNE 2019

MEMORANDUM FOR Commander, Ft. Worth District

SUBJECT: SWD, Mitchell Lake, TX, Ecosystem Restoration Feasibility Study Review Plan – Review Plan (RP) Approval

1. References:

a. EC 1165-2-217, Review Policy for Civil Works, 20 February 2018.

b. Memorandum, CESWD-RBT, 4 March 2019, subject: Delegation of Authority for Review Plans for Civil Works Projects.

c. Memorandum, CEMVD-PD (ECO-PCX), 18 March 2019, subject: Mitchell Lake Ecosystem Restoration Study, San Antonio, Texas Review Plan Endorsement (encl 1).

d. E-mail: CESWF-PER-PF, 3 May 2019, subject: RE: Mitchell Lake: Draft RP (encl 2).

2. In accordance with references 1.a and 1.b., and based on review by my staff, I hereby approve the submitted RP (encl 3) for subject referenced ecosystem restoration feasibility study.

3. Please post the approved RP with a copy of this memorandum to the District's public internet website and provide the internet address to the POC as indicated. Prior to posting the RP, the names of USACE employees listed in the RP shall be removed.

4. The SWD point of contact for this action is Mr. Sean P. Mickal, CESWD-PD, at (469) 487-7063 or sean.p.mickal@usace.army.mil.

3 Encls

MARK L. MAZZANTI
Director, Programs Directorate

REVIEW PLAN

03 May 2019

Project Name: Mitchell Lake, San Antonio (Bexar County, Texas)

P2 Number: 459586

Decision Document Type: Integrated Feasibility Report and Environmental Assessment

Project Type: Single-Purpose Ecosystem Restoration

District: Fort Worth

District Contact: Temple McCoy 817-886-1164

Major Subordinate Command (MSC): Southwestern Division

MSC Contact: Lauren Kruse 469-487-7045

Review Management Organization (RMO): Ecosystem Restoration Planning Center of Expertise

RMO Contact: Rachel Mesko 206-617-2847

Key Review Plan Dates

Date of RMO Endorsement of Review Plan:	**2019-03-18**
Date of MSC Approval of Review Plan:	**2019-06-21**
Date of IEPR Exclusion Approval:	**2019-06-21**
Has the Review Plan changed since PCX Endorsement?	**Yes**
Date of Last Review Plan Revision:	**N/A**
Date of Review Plan Web Posting:	**Pending**
Date of Congressional Notifications:	**Pending**

Milestone Schedule

	Scheduled	**Actual**	**Complete**
Alternatives Milestone:	01-16-2019	01-16-2019	Yes
Tentatively Selected Plan:	09-11-2019	(enter date)	No

Release Draft Report to Public:	12-16-2019	(enter date)	No
Agency Decision Milestone:	04-23-2020	(enter date)	No
Final Report Transmittal:	10-15-2020	(enter date)	No
Senior Leaders Briefing:	11-30-2020	(enter date)	No
Chief's Report:	09-19-2021	(enter date)	No

Review Plan Purpose and Requirements

Teams use Review Plans to define the scope and level of internal and external reviews of all Civil Works projects, typically starting with an initial review plan focused on the decision document. The plans outline the review scope and strategy. Review Plans are concise documents that walk teams and the public through the various levels of independent review. These plans provide a risk-informed assessment of the scope of reviews as well as specific details regarding how the various independent reviews will be completed. See EC 1165-2-217.

Project Fact Sheet

March 2019

Project Name: Mitchell Lake, TX

Location: Texas, Bexar County, San Antonio

Authority: A resolution from the Committee on Transportation and Infrastructure, U.S. House of Representatives, dated 11 March 1998, , which reads: "Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, That, the Secretary of the Army is requested to review the report of the Chief of Engineers on the Guadalupe and San Antonio Rivers, Texas, published as House Document 344, 83rd Congress, 2nd Session, and other pertinent reports, with a view to determining whether any modifications to the recommendations contained therein are advisable at the present time, with particular reference to providing improvements in the interest of flood control, environmental restoration and protection, water quality, water supply, and allied purposes on the Guadalupe and San Antonio Rivers in Texas."

Sponsor: San Antonio Water System

Type of Study: Feasibility

SMART Planning Status: 3x3x3 compliant

Project Area: The study area is located in south San Antonio, Texas (Figure 1 and Figure 2). It is just north of the confluence of the Medina River and Leon Creek (both tributaries of the San Antonio River). The area is a natural drainage between the Balcones Fault zone to the north and the Luling fault zone to the south. Mitchell Lake has experienced impacts from human development as early as the 1800's. It has a historical background as a tule

wetland, but is now a converted open water habitat due to its damming in 1901 for irrigation purposes. Tule is a common name for hardstem bulrush (*Scirpus acutus*). However, original explorers and settlers of the western United States did not differentiate between the different bulrush species, so a tule wetland is a wetland with tall emergent vegetation. An effluent canal was diverted directly into Mitchell Lake at the beginning of the 20th century and canal use continued into the 1970's. The nutrient loading has caused severe impacts to the habitat. The lake is hyper-eutrophic in response to decades of external nutrient inputs from raw wastewater and wastewater sludge. Mitchell Lake is shallow, the deepest section known to be eight feet. There is limited wetland and habitat diversity in correlation with the overabundance of invasive plant species and unbalanced soil and water chemistry. The Mitchell Lake wetland complex, 600 acres, includes the lake and another 215 acres of ponds and marshes. There are also 385 acres of connected upland habitats within the 1200-acre complex that is owned and managed by the San Antonio Water System (Figure 3).

Problem: Broadly, the problem is the loss of both habitat structure and function. Mitchell Lake has been an important resource for wildlife and human communities. Beginning before the first European explorers in the area settled in the area. Mitchell Lake provided a wide range of ecological goods and services, not the least of which was sustenance for humans, livestock, and wildlife. Extensive use of Mitchell Lake as a 20th century wastewater facility, beginning with the construction of the dam in 1901, has created current conditions that no longer support the diversity of aquatic species and wildlife described by 19th century naturalists. Where there once existed an ecologically rich freshwater emergent wetland, there is now a larger open water site surrounded by herbaceous vegetation and invasive riparian species. Though the lake no longer serves a wastewater function, the degradation from that function is still evident. The waters of Mitchell Lake are highly eutrophic causing unstable dissolved oxygen and pH levels, and therefore the current conditions no longer support the rich biodiversity of the historic wetland vegetation community or other aquatic life. Despite degraded conditions and ecological losses, the opportunity of a high quality ecosystem is evident, and currently provides an important wildlife habitat. The area currently remains able to provide limited services to over 338 migratory bird species – 30 species on the Audubon Watch List; and 129 species considered to be directly threatened by habitat loss and climate change.

Preliminary Measures: Restoration efforts could include ecosystem restoration (ER) measures or ER measures combined with water quality measures. ER and ER/water quality combination measures will be carried forward to alternative formulation. The measures considered were developed during the initial one-day meeting with Resource Agencies at the SAWS headquarters in San Antonio, TX. Measure success will be dependent on site conditions at Mitchell Lake. The habitat measures will specifically benefit Neotropical and temperate migrant bird species which are of regional, national, and international significance. Ecosystem restoration measures for Mitchell Lake include:

- Relocating Leon Creek effluent discharge may have a positive effect on the habitat surrounding Mitchell Lake. The discharge line is located at the southwestern portion of Mitchell Lake. The placement of this confluence can substantially alter the amount of sediment filtering through the lake.

- Initiating “seasonal” pulses of lake releases and altering the lake level elevations would permit eutrophic water release without negatively altering downstream habitat. Pulses of water would assist with pushing the contaminated water out of Mitchell Lake in a way that minimizes the amount of contaminated water that travels downstream.
- Modifying the dam, spillway, and/or polders are measures that have been considered. Although, altering the dam and/or the spillway may have flood risk management implications. Modifying the structures could prove to be very beneficial by improving control over water levels and water flow. Modifications to the dam or spillway will be the responsibility of the local sponsor, and happen outside the scope of this study / project.
- Invasive species management is an effective tool for increasing habitat diversity and should be considered valuable for any alternative chosen. Invasive species can be reduced through a number of tools, but are usually species-specific. Invasive species removal methods include mechanical, chemical, biological, and cultural techniques.
- Creation of habitat structures including, but not limited to: islands; snags; woody debris; cover; shading structures; nest boxes; and habitat corridors would be worthwhile to increase wildlife species diversity and success. Many of these structures can provide important benefits for a variety of wildlife.
- Altering current channel to a more natural channel design is a common method to improve riparian habitat. Developing pool, riffle, run sequences between Mitchell Lake, wetlands, and the Medina River can improve fish habitat and allow sediment to filter in between the locations. One of the advantages of slow-moving water is the progression of debris settlement. Improved or additional pool, riffle, run sequence could beneficial by decreasing the amount of sediment that enters the lake.

Ecosystem restoration and water quality measures include:

- Construction of wetlands upstream and downstream. This measure will not only increase habitat and species diversity but can also be used to filter contaminated water which will, over time, reduce the effects of nutrient loading within the lake.
- Nutrient removal from Leon Creek Water Recycling Center discharge pipe point source pollution into Mitchell Lake. Higher concentrations of nutrients such as nitrogen and phosphorus occur naturally in soils, but excessive amounts lead to eutrophic conditions, low dissolved oxygen levels, and decrease plant growth.
- Lake sediment dredge. Dredging can be performed to reduce exposure of fish and wildlife exposure to contaminated water. Removing the materials will also decrease the amount of sediments flowing downstream.
- Aquatic and riparian plantings on fringe and surrounding habitat.
- Development of embayments.
- Creation of lake and/or fringe wetlands.

Preliminary Alternatives include:

- Wetland creation within the study area
- Stream restoration on Cottonmouth Creek
- Riparian zone creation/enhancement along Cottonmouth Creek

Scales for each alternative:

- Hydroseeding
- Bare-root seeding/plugs
- Sapling (Riparian)

Federal Interest: **Nationally Significant:** The North American Central Flyway passes through 10 other U.S. states before funneling 80-90% of the migratory population to the state of Texas, and ultimately through south Central Texas. The San Antonio region, and subsequently Mitchell Lake, is situated at the intersection of three ecoregions allowing for a large bio-diversity of habitats which provide the requisite migratory needs of these high species numbers. Evidence of the importance of the intersection of these ecoregions is the presence of the Mitchell Lake emergent wetland complex. The emergent wetland complex is rare in this region of Texas. The ecosystem benefits it provides are therefore unique to the region and provides critical resources for migratory birds utilizing the Central Flyway. Threatened and Endangered species such as Interior Least Tern (*Sterna antillarum*), Golden-cheeked Warbler (*Setophaga chrysoparia*), Red Knot (*Calidris canutus rufa*), and piping plover (*Charadrius melodus*) have been recorded in the areas surrounding Mitchell Lake.

Mitchell Lake is part of an interconnected system of USACE ecosystem restoration projects in the San Antonio area including the Eagleland, Mission Reach, River Road, and Westside Creek ecosystem restoration projects within the San Antonio River Channel Improvement Project. Avian studies conducted during the feasibility phase of Westside Creeks illustrate the importance of aquatic systems in urban and suburban environments, even in a degraded condition. In combination with these projects, and others undertaken by the City of San Antonio, Bexar County, and other non-governmental organizations, the Mitchell Lake ecosystem Restoration project would increase the quality of the degraded habitats already utilized by these and other species and would develop migratory bird habitat for neotropical migrants not currently utilizing these habitats at a critical location along the Central Flyway.

Risk Identification:

- USACE & NFS are aligned on ecosystem restoration vs. water quality objectives
- Existing site conditions may not be suitable for restoration measures
- Any additional measures identified during planning process may require additional habitat models or modification of existing models

Neither ecosystem conditions now, nor in the future, pose a significant threat to human life or the environment.

Cost Estimate: $0 - $50,000,000. See PMP for more Information.

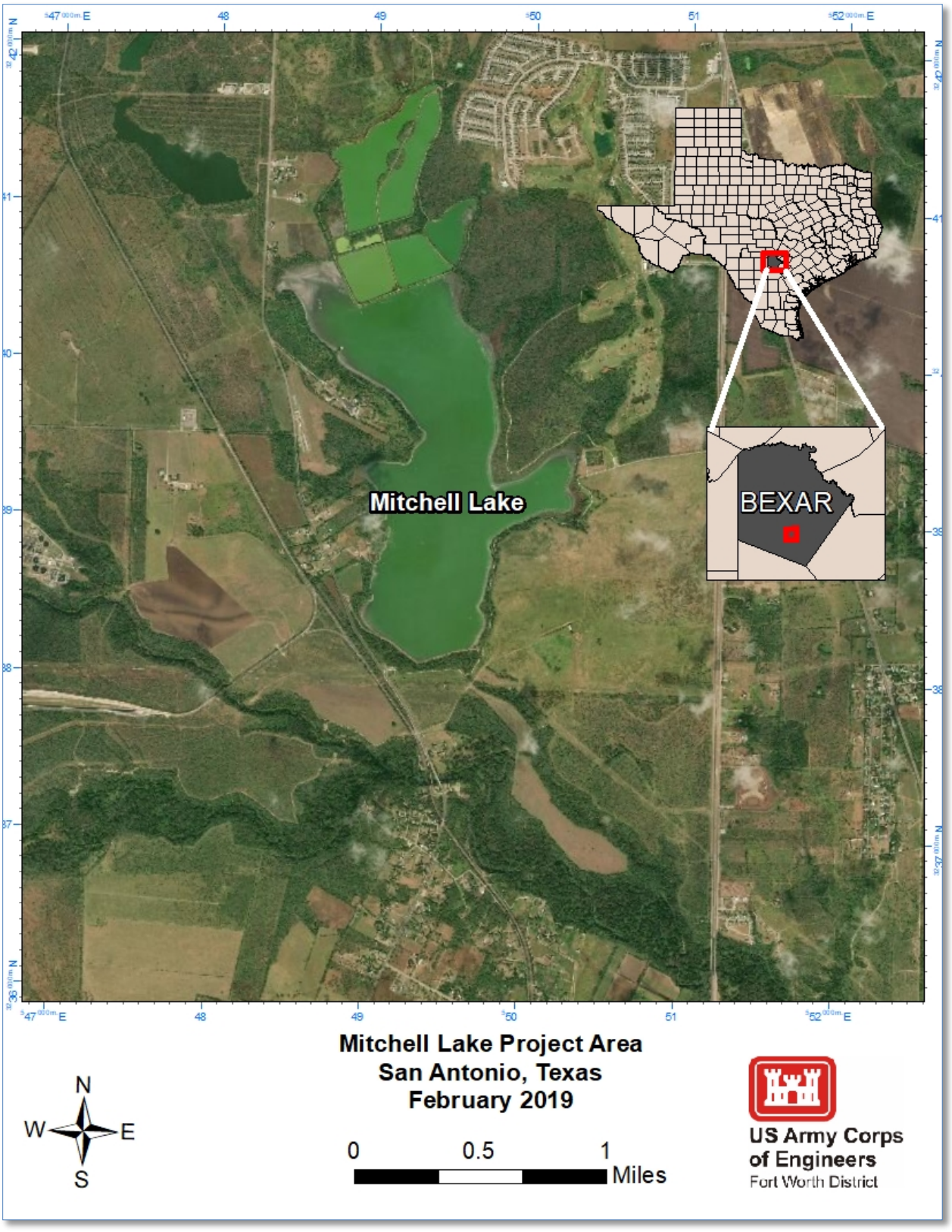

Figure 1. Map showing the Mitchell Lake project area.

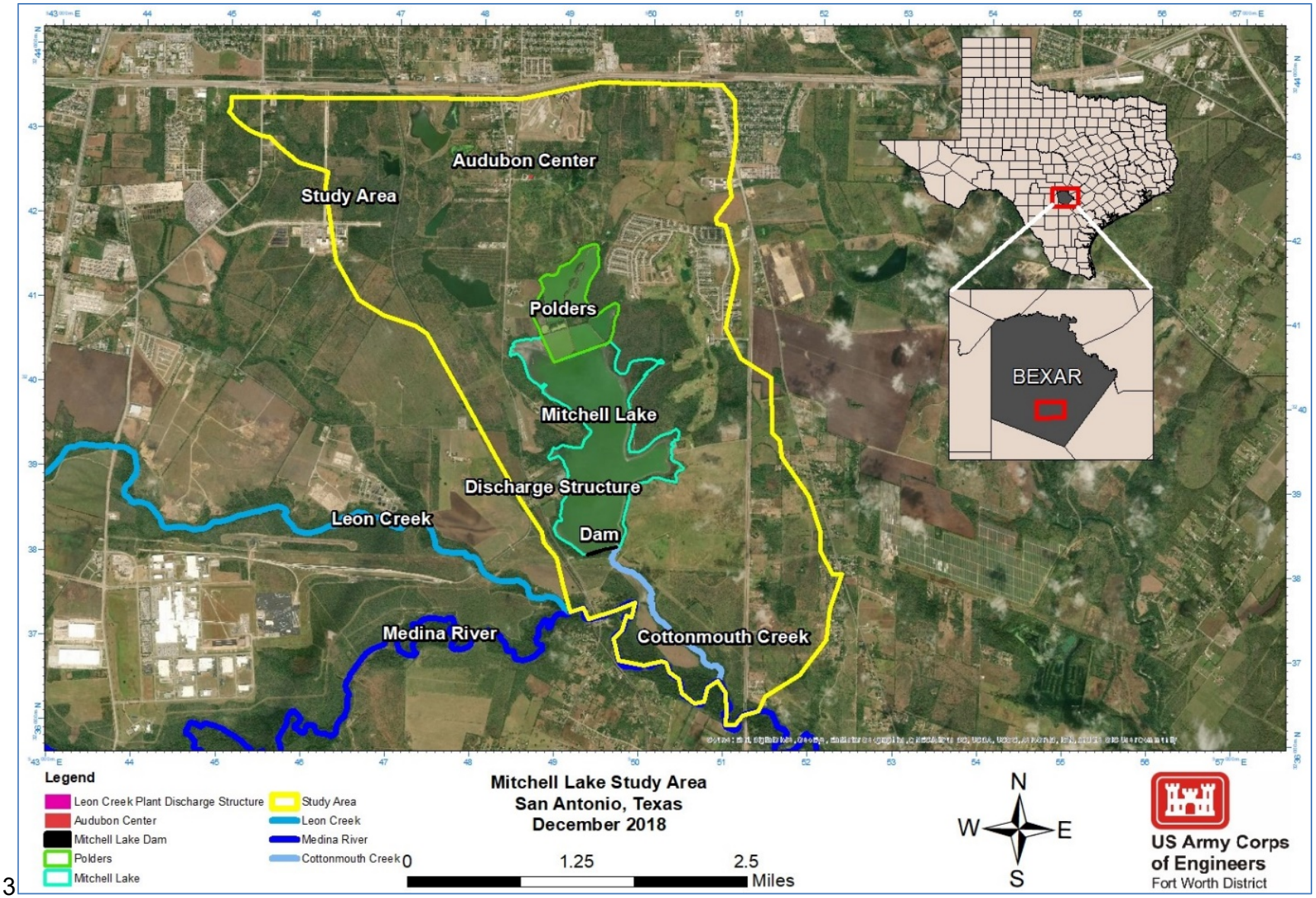

Figure 2 – Map showing the Mitchell Lake study area and features.

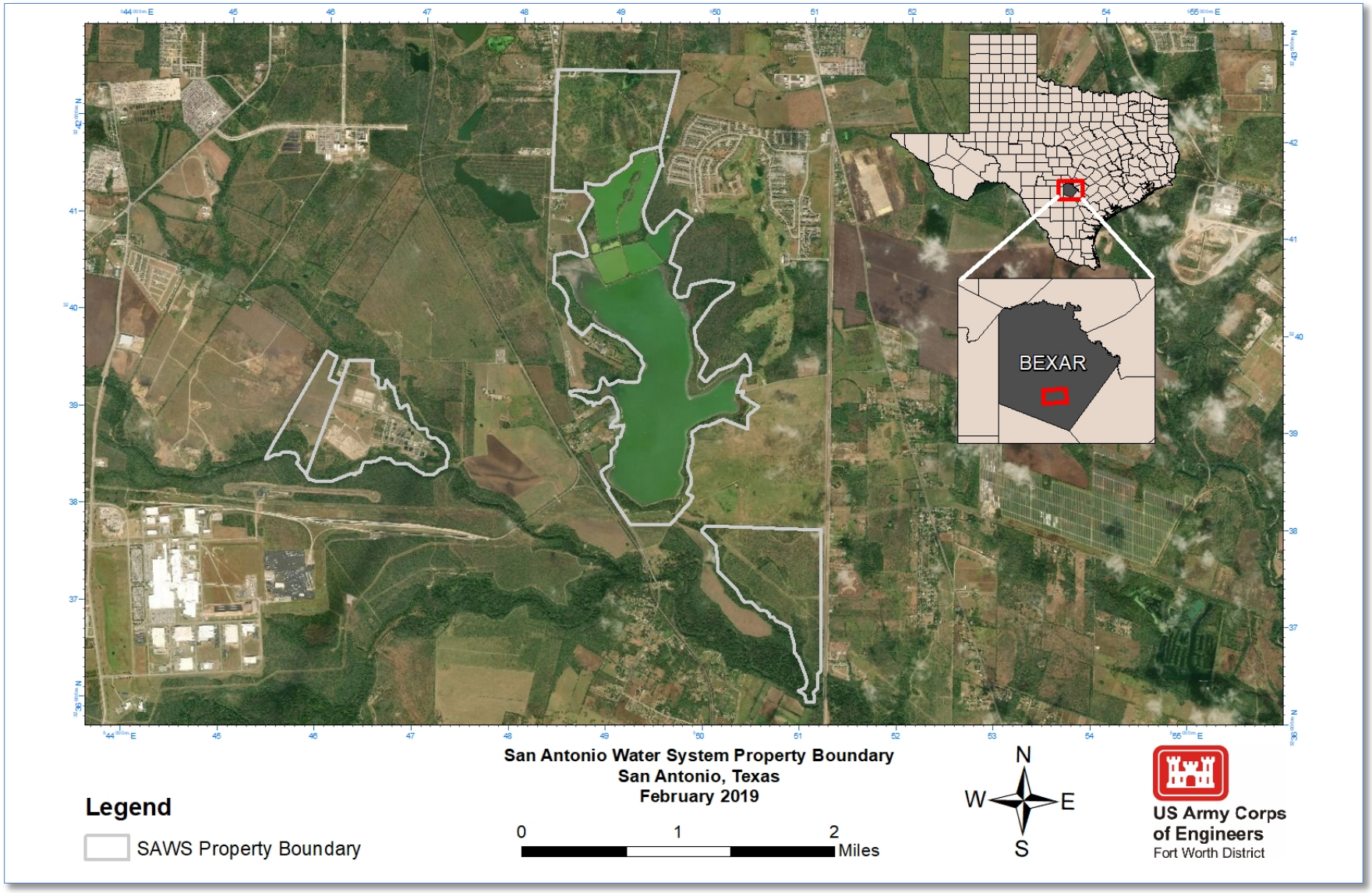

Figure 3. Map showing the San Antonio Water System property boundary.

1. FACTORS AFFECTING THE SCOPE AND LEVELS OF REVIEW

Scope of Review.

A. Will the study likely be challenging? No. The USACE has completed many similar ecosystem restoration projects near the Mitchell Lake project area. Examples of other USACE ecosystem restoration studies, and their implemented projects, are as follows: Olmos Creek Section 206, Westside Creek GRR, and the Mission Reach GI. This study will not meet the level of complexity that would trigger an IEPR. However, due to the presence of poor water quality, ecosystem restoration measures, and subsequent alternatives, will need to take existing and projected future water quality into account.

B. Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks. Please see the risks as identified earlier in this document.

C. Is the project likely to be justified by life safety or is the study or project likely to involve significant life safety issues? No. Ecosystem restoration implementation will not be justified by life safety risks, nor is the study or project implementation likely to involve any life safety issues. While there is a dam and a spillway present, the USACE will not be involved in any dam or spillway modifications.

D. Has the Governor of an affected state requested a peer review by independent experts? No. The governor of Texas, Mr. Greg Abbott, has not requested a peer review.

E. Will it likely involve significant public dispute as to the project's size, nature, or effects? No. The USACE has completed many similar ecosystem restoration projects near the Mitchell Lake project area without significant public dispute as to project size, nature, or effects. This study is not expected to be different.

F. Is the project/study likely to involve significant public dispute as to the economic or environmental cost or benefit of the project? No. The USACE has completed many similar ecosystem restoration projects near the Mitchell Lake project area without significant public dispute as to economic or environmental costs or benefits. This study is not expected to be different.

G. Is the information in the decision document or anticipated project design likely to be based on novel methods, involve innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices? No. The USACE has completed many similar ecosystem restoration projects near the Mitchell Lake project area, none of which was based upon novel methods, used innovative materials or techniques, presented complex challenges for interpretation, contained precedent-setting methods or model, nor did they

present conclusions likely to change prevailing practices. This study is not expected to be different.

H. Does the project design require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule? No. The project has not been designed. However, the USACE has completed many similar ecosystem restoration projects near the Mitchell Lake project area, none of which required redundancy, resiliency and / or robustness, unique construction sequencing, or a reduced or overlapping design / construction schedule except for scheduling to accommodate the presence of T&E species.

I. Is the estimated total cost of the project greater than $200 million? No. It is not anticipated that the total project cost of the project will be greater than $200 million. Estimated total project cost ranges between $10 – 100 million.

J. Will an Environmental Impact Statement be prepared as part of the study? No. The USACE has completed many similar ecosystem restoration projects near the Mitchell Lake project area. It is anticipated that an Environmental Assessment will be prepared as part of the study.

K. Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources? No. The USACE has completed many similar ecosystem restoration projects near the Mitchell Lake project area. The project is not expected to have any adverse impacts on scarce or unique tribal, cultural, or historic properties.

L. Is the project expected to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures? No. The USACE has completed many similar ecosystem restoration projects near the Mitchell Lake project area. The project is not expected to have substantial adverse impacts on fish and wildlife species, or their habitats, prior to the implementation of mitigation measures as this is an ecosystem restoration study and will not include a mitigation plan.

M. Is the project expected to have, before mitigation measures, more than a negligible adverse impact on an endangered or threatened species or their designated critical habitat? No. The USACE has completed many similar ecosystem restoration projects near the Mitchell Lake project area. The project is not expected to have more than negligible adverse impacts to an endangered or threatened species, or their designated critical habitat, as this is an ecosystem restoration study and will not include a mitigation plan. It is impossible to say unequivocally that no ESA species habitat will be altered, the purpose of USACE ecosystem restoration projects is to provide an increase in habitat quality.

2. REVIEW EXECUTION PLAN

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

District Quality Control. All decision documents (including data, analyses, environmental compliance documents, etc. whether generated by USACE, sponsor, or contractors) 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. All decision documents (including data, analyses, environmental compliance documents, etc. whether generated by USACE, sponsor, or contractors) undergo ATR.

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

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

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

NOTE: No products are expected from contractors, or from sponsor's in-kind contributions.

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 by Product

Product(s)	Review Level	Start Date	End Date	Cost	Complete
Draft Feasibility Report and EA	DQC	07-02-2019	07-30-2018	$15K	No
Draft Feasibility Report and EA	ATR	12-16-2019	01-07-2020	$30K	No
Draft Feasibility Report and EA	Public / Policy / Legal	12-16-2019	01-07-2020	n/a	No
Final Feasibility Report and EA	DQC	09-16-2020	10-15-2020	$15K	No
Final Feasibility Report and EA	ATR	10-18-2020	11-07-2020	$30K	No
Final Feasibility Report and EA	Policy / Legal	10-18-2020	11-07-2020	n/a	No

a. DISTRICT QUALITY CONTROL

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

Table 2: Required DQC Expertise

DQC Team Disciplines	Expertise Required
DQC Lead	A senior professional with extensive experience preparing Civil Works decision documents and conducting DQC. The lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc.).
Planning	A senior water resources planner with experience in reviewing Plan Formulation processes for civil works ecosystem restoration feasibility studies, and be able to draw on “lessons learned” in advising the PDT of best practices. The reviewer should also have recent knowledge of accepted planning models.
Economics	The reviewer should be a senior professional, be familiar with the processes used in evaluation of ecosystem restoration projects, cost effective / incremental cost

	analyses, and have recent experience in preparing economic analysis plans for ecosystem restoration feasibility studies. Analysis will address all four-project accounts. The reviewer should also have recent knowledge of accepted economics models.
Environmental Resources	The reviewer should be an environmental subject matter expert in the habitat types and ecological processes found in the study area, as well as water quality. The reviewer should be familiar with preparing, processing, and reviewing NEPA and environmental law compliance documents and have working knowledge of accepted habitat models. Reviewer should also have recent experience using IWR Suite software.
Cultural Resources	The reviewer should be a senior professional with demonstrated experience with Native American tribes and archeological and cultural resources. The reviewer should also be familiar with preparing, processing, and reviewing cultural resource law compliance documentation.
Hydrology & Hydraulic Engineering	The reviewer should be a senior professional and have extensive knowledge of hydrology of the San Antonio River basin or similar. The reviewer should also have recent knowledge of accepted hydrological models for both lakes and rivers.
	The reviewer should be a senior professional, carry a Professional Engineer's license, and have extensive knowledge of HEC-RAS modeling including the use of GIS (ARC-INFO) inputs to the model. The reviewer should also have a solid understanding of the geomorphology of alluvial rivers. The reviewer should also have recent knowledge of accepted hydraulic models for both lakes and rivers.
Geotechnical Engineering	The reviewer should be a senior professional, carry a Professional Engineer's license, and have recent experience in the Corps' design requirements for levee work. This person should also have experience in investigating existing subsurface conditions and materials; determining their physical/mechanical and chemical properties that are relevant to the project considered, assessing risks posed by site conditions; and designing earthworks and structure foundations.
Civil Engineering	The reviewer should be a senior professional, carry a Professional Engineer's license, and have recent experience in the design and of plans and specifications

	for USACE ecosystem restoration projects, to include tie in to natural features.
Cost Engineering	The reviewer should be a senior professional and have extensive Corps' experience in the application of scientific principles and techniques to problems of cost estimating, cost control, business planning and management science, profitability analysis, project management, and planning and scheduling.
Real Estate	The reviewer should be a senior professional with multiple years of experience in real estate issues related to ecosystem restoration studies and project implementation.

Documentation of DQC. Quality Control should be performed continuously throughout the study. A specific certification of DQC completion is required at the draft and final report stages. Documentation of DQC should follow the District Quality Manual and the MSC Quality Management Plan. An example DQC Certification statement is provided in EC 1165-2-217, on page 19 (see Figure F).

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

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

b. AGENCY TECHNICAL REVIEW

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

Table 3: Required ATR Team Expertise

ATR Team Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience in preparing Civil Works decision documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline (such as planning, economics, Ecological Resources, etc.). The ATR team leader will be from outside the home MSC. The ECO-PCX and ATR lead will identify the ATR team members.
3Planning	A senior water resources planner with experience in Plan Formulation processes for ecosystem restoration, and / or multi-purpose studies, and be able to draw on “lessons learned” in advising the PDT of best practices. The reviewer should also have recent knowledge of accepted planning models.
Economics	The reviewer should be a senior professional, be familiar with the processes used in evaluation of ecosystem restoration projects, cost effectiveness / incremental cost analyses, and have recent experience in preparing economic analysis plans for ecosystem restoration feasibility studies. Analysis will address all four-project accounts. The reviewer should also have recent knowledge of accepted economics models and should also have recent experience using IWR Suite software.
Environmental Resources	The reviewer should be an environmental subject matter expert in the habitat types and ecological processes found in the study area, as well as water quality. The reviewer needs to have personal experience in ecosystem restoration. The reviewer should be familiar with preparing, processing, and reviewing NEPA and environmental law compliance documents and have working knowledge of accepted habitat models, including HEP and HSIs. Reviewer should also have recent experience using IWR Suite software.
Cultural Resources	The reviewer should be a senior professional with demonstrated experience with Native American tribes and archeological and cultural resources. The reviewer should also be familiar with preparing, processing, and reviewing cultural resource law compliance documentation.

Hydrology & Hydraulic Engineering	The reviewer should be a senior professional and have extensive knowledge of hydrology of the San Antonio River basin, or similar. The reviewer should also have recent knowledge of accepted hydrological models for both lakes and river.
	The reviewer should be a senior professional, carry a Professional Engineer's license, and have extensive knowledge of HEC-RAS modeling including the use of GIS (ARC-INFO) inputs to the model. The reviewer should also have a solid understanding of the geomorphology of alluvial rivers. The reviewer should also have recent knowledge of accepted hydraulic models for both lakes and rivers.
Geotechnical Engineering	The reviewer should be a senior professional, carry a Professional Engineer's license, and have recent experience in the Corps' design requirements for ecosystem restoration work. This person should also have experience in investigating existing subsurface conditions and materials; determining physical / mechanical and chemical properties that are relevant to the project considered, assessing risks posed by site conditions (to include water quality and HTRW issues); and designing earthworks and structure foundations.
Civil Engineering	The reviewer should be a senior professional, carry a Professional Engineer's license, and have recent experience in the design and of plans and specifications for USACE ecosystem restoration projects, to include tie in to natural features.
Cost Engineering	The reviewer should be a senior professional, carry a Professional Engineer's license, and have extensive Corps' experience in the application of scientific principles and techniques to problems of cost estimating, cost control, business planning and management science, profitability analysis, project management, and planning and scheduling. Review will be coordinated through the Civil Works Cost Engineering and Agency Technical Review Mandatory Center of Expertise (MCX), and reviewer must be approved by the MCX.
Real Estate	The reviewer should be a senior professional with multiple years of experience in real estate issues related to ecosystem restoration studies and project implementation.

Climate Preparedness and Resilience CoP Reviewer	A member of the Climate Preparedness and Resiliency Community of Practice will participate in the ATR review.

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

NOTE: ATR begins concurrently with Public, Policy, and Legal reviews of the DRAFT report, and concurrently with Policy and Legal reviews of the FINAL report.

c. INDEPENDENT EXTERNAL PEER REVIEW

(i) Type 1 IEPR.

Decision on Type 1 IEPR. This ecosystem restoration study does not meet any of the mandatory triggers for the requirement of conducting an IEPR.

1. The consequences of non-performance on project economics, the environmental and social well-being (public safety and social justice):

- The consequences of non-performance will have no impacts on the economics, social well-being, public safety, or social justice as this is an ecosystem restoration on lands already designated as conservation areas. The existing ecosystem contains low quality habitat that the study is intending to improve. Where possible, the restoration features will be integrated with existing habitat features of value. If the project fails, the resulting habitat quality would be no less than the existing conditions after the project area recovers from any disturbance related to restoration activities.

2. The Mitchell Lake Integrated Feasibility Report and Environmental Assessment is not likely to contain influential scientific information, or a highly influential scientific assessment.

3. Per EC 1165-2-217, “A project study may be excluded from Type 1 IEPR in cases where none of the mandatory triggers listed above are met (with the limited exception noted in Paragraph 11.d.(1)(b) AND if any of the following three sets of conditions apply (11.d.(4)(a), 11.d.(4)(b) or 11.d.(4)(c):”, the decision document will not trigger any of the factors which would require a Type 1 IEPR. See Section 1. Factors Affecting the Level of Review above for a listing of each factor and short explanation. The Mitchell Lake ecosystem restoration study

(ii) Type 2 IEPR.

Decision on Type 2 IEPR. This ecosystem restoration study does not meet any of the mandatory triggers for the requirement of conducting an IEPR.

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
Habitat Suitability Index (HSI)	HSIs provide habitat information for evaluating impacts on fish and wildlife habitat resulting from water or land use changes. The reports synthesize habitat information into explicit habitat models useful in quantitative assessments. • Marsh Wren • Bullfrog • Barred Owl • Fox Squirrel • Shelterbelt	Approved for Regional Use They were “grandfathered” per HQ Memorandum, Subject: Policy Guidance on Certification of Ecosystem Output Models, dated 2008. No expiration date.
Qualitative Habitat Evaluation Index (QHEI)	QHEI is a method to provide a quantitative evaluation of the qualitative physical characteristics of a given stream reach.	Regionally Approved 2018-03-06 - The planning model has been approved for use on one or more Corps projects. The model has been reviewed and while identified issues with the model and its documentation have been effectively resolved to the

		satisfaction of the PCX for one or more specific project applications, it has not been approved for regional or nation-wide application due to pending issues concerning the model and its documentation (see PCX and/or model review history for details). Expires 2025-03-06
Avian Index of Biological Integrity (IBI) – Central Texas	Indices of Biological Integrity are developed for specific geographic areas and for specific sampling methodologies. This tool identified and classified water pollution problems.	Certified for Regional Use 2013-07-02 Expires 2020-03-06
IWR Planning Suite 2.0.9	The IWR Planning Suite is a water resources investment decision support tool originally built for the formulation and evaluation of ecosystem restoration alternative plans; however, it is now more widely used by all USACE business lines for evaluation of actions involving monetary and non-monetary cost and benefits.	Certified 2018-05-31 Expires 2025-05-31

The barred owl and shelterbelt models include metrics that take into consideration: percent canopy cover, tree DBH, Number of trees above 20" DBH, vertical stratification, tree height, and number of shelterbelt rows. The Habitat Suitability Index score will be affected by the outcome of those metrics, which correlate to an older and well forested area. The marsh wren HEP model has a direct association to aquatic emergent vegetation. It is assumed by the HEP model that cover and nesting requirements can be supplied by herbaceous wetlands that support hydrophytes such as bulrushes (*Typha spp.*), and contain standing water. The metrics include: growth form of emergent hydrophytes, percent canopy cover of emergent herbaceous vegetation, mean water depth, and percent canopy cover of woody vegetation. The Avian IBI metrics include: land use; channel development; percent cover of herbaceous, shrub, and overstory species. The Avian IBI can be used to determine the condition of living systems at the site and will give the team a direct measurement of species diversity. QHEI metrics include: substrate, Instream cover, channel morphology, riparian zone and bank erosion, pool/glide and riffle-run quality, and map gradient. QHEI can be used to develop an assessment of physical characteristics and quality of sampled streams.

NOTE: The shelterbelt spreadsheet has not yet been developed or approved. SWF & the Eco-PCX are in the approval process.

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 have 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 5.0.6 (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

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 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.

TEAM ROSTERS

PROJECT DELIVERY TEAM			
Name	**Office**	**Position**	**Phone Number**
[redacted]	CESWF-PM-C	PM	[redacted]
[redacted]	CESWF-PEC-PF	Planning	[redacted]
[redacted]	CESWF-EC-H	H&H	[redacted]
[redacted]	CESWF-PEC-PE	Economics	[redacted]
[redacted]	CESWF-PEC-TN	Environmental Resources	[redacted]
[redacted]	CESWF-PEC-CC	Environmental Resources	[redacted]
[redacted]	CESWF-PEC-TN	Cultural Resources	[redacted]
[redacted]	CESWF-EC-G	Geotechnical Engineering	[redacted]
[redacted]	CESWF-EC-DC	Engineering Technical Lead	[redacted]
[redacted]	CESWF-EC-AC	Cost Engineering	[redacted]
[redacted]	CESWF-EC-DS	Structural Engineering	[redacted]
[redacted]	CESWF-EC-DC	Design	[redacted]
[redacted]	CESWF-RE-A	Real Estate	[redacted]
[redacted]	CESWF-OC	Attorney	[redacted]

DISTRICT QUALITY CONTROL TEAM			
Name	**Office**	**Position**	**Phone Number**
[redacted]	CESWF-PEC-PF	DQC Lead	[redacted]
[redacted]	CESWF-PEC-PF	Planning	[redacted]
[redacted]	CESWG-EC-HB	H&H	[redacted]
[redacted]	CESWF-PEC-E	Economics	[redacted]
[redacted]	CESWF-PEC-TN	Environmental Resources	[redacted]
[redacted]	CESWF-PEC-CI	Cultural Resources	[redacted]
[redacted]	CESWG-ECE-S	Geotechnical Engineering	[redacted]
[redacted]	CESWG-EC-EG	Civil Engineering	[redacted]
[redacted]	CESWG-EC-PS	Cost Engineering	[redacted]
[redacted]	CESWL-EC-DM	Structural Engineering	[redacted]
[redacted]	CESWG-RE-S	Real Estate	[redacted]

AGENCY TECHNICAL REVIEW TEAM			
Name	**Office**	**Position**	**Phone Number**
[redacted]	CEMVP-PD	PCX-POC	[redacted]
[redacted]	CENWS-PMP-E	ATR Lead	[redacted]
[redacted]	CELRD	Planning	[redacted]
[redacted]	CESWT-EC-HF	H&H	[redacted]
[redacted]	CENWO-PM-AB	Economics	[redacted]
[redacted]	CENWS-PMP-E	Environmental Resources	[redacted]
[redacted]	CELRL-PM-P-E	Cultural Resources	[redacted]
[redacted]	CEMVM-EC-D	Geotechnical Engineering	[redacted]
[redacted]	CEMVM-EC-D	Civil Engineering	[redacted]
[redacted]	CENWW	Cost Engineering	[redacted]
[redacted]	CEMVM-EC-D	Structural Engineering	[redacted]
[redacted]	CENAB	Real Estate	[redacted]
[redacted]	CESWT-EC-HF	Climate	[redacted]

VERTICAL TEAM			
Name	**Office**	**Position**	**Phone Number**
[redacted]	CESWD-PDP	Chief , Planning	[redacted]
[redacted]	CESWD-PDP	Senior Planner	[redacted]
[redacted]	CESWD-PDP	Senior Economist	[redacted]
[redacted]	CESWD-PDP	Senior Environmental	[redacted]
[redacted]	CESWD-RBT	Civil Engineer	[redacted]
[redacted]	CESWD-PDP	Environmental Engineer	[redacted]
[redacted]	CESWD-PDR	Chief, Real Estate	[redacted]
[redacted]	CESWD-PDO	Chief, Operations & Regulatory	[redacted]
[redacted]	CECC-SWD	Assistant Counsel	[redacted]

POLICY REVIEW TEAM			
Name	**Office**	**Position**	**Phone Number**
[redacted]	CECW-SWD	Program Manager	[redacted]
[redacted]	CESWD-PDP	Policy Review Team Lead	[redacted]

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, MISSISSIPPI VALLEY DIVISION
P.O. BOX 80
VICKSBURG, MISSISSIPPI 39181-0080

CEMVD-PD (ECO-PCX) 18 March 2019

MEMORANDUM FOR Commander, Fort Worth District
ATTN: Brian Harper, CESWF-PEC-P

SUBJECT: Mitchell Lake Ecosystem Restoration Study, San Antonio, Texas Review Plan Endorsement

1. References

   a. Engineer Circular (EC) 1165-2-217 Review Policy for Civil Works, 20 Feb 2018.
   b. Engineer Regulation 1110-2-12, Quality Management, 30 Sept 2006.
   c. Type I Independent External Peer Review Standard Operating Procedure, Aug 2016.
   d. U.S. Army Corps of Engineers, Memorandum for Major Subordinate Commanders, Subject – Revised Delegation of Authority in Section 2034(a)(5)(A) of the Water Resources Development Act of 2007 (WRDA 2007), as amended (33 U.S.C. 2343), 23 May 2018.
   e. Draft Review Plan, Mitchell Lake, San Antonio, Texas, Feb 2018.

2. The enclosed Review Plan complies with all applicable policy and provides for adequate District Quality Control and Agency Technical Review for the plan formulation, engineering, and environmental analyses, and other aspect of plan development. The National Ecosystem Restoration Planning Center of Expertise (ECO-PCX) recommends the Southwestern Division approve the Review Plan following the provisions of EC 1165-2-217 (Reference 1.a.).

3. The Review Plan uses criteria in EC 1165-2-217 to assess the risk of excluding the study from Type I Independent External Peer Review (IEPR). A risk assessment shows that the study does not meet the criteria for mandatory IEPR. The ECO-PCX concurs with the Fort Worth District's plan to seek an exclusion to performing Type I IEPR. The ECO-PCX concurs with the District's risk assessment in the Draft Review Plan. The procedures outlined in References 1.c. and 1.d. should be followed to seek approval of the request to exclude the study from Type I IEPR. Please include the ECO-PCX on all vertical team coordination related to the exclusion request.

4. The ECO-PCX recommends approval of the Review Plan by the major Subordinate Command. Upon approval, please provide the ECO-PCX with a copy of the Review Plan and the approval memorandum, and the link to where the plan is posted on the District website. If revisions are made to the plan due to changes in project scope or Corps policy, a revised Review Plan should be provided to the ECO-PCX for review. Non-substantive changes do

not require further ECO-PCX review but should be documented in an updated Review Plan and provided to the ECO-PCX and other members of the vertical team.

5. Thank you for the opportunity to assist in the preparation of the Review Plan. If you have any questions about the plan or other aspects of review requirements, please contact Ms. Rachel Mesko, the ECO-PCX Account Manager for the Southwestern Division. We look forward to continuing to work with the team as the study progresses.

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Digitally signed by MACINNES.ANDREW.DOUGLAS.1368729082
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=MACINNES.ANDREW.DOUGLAS.1368729082
Date: 2019.03.18 12:28:39 -05'00'

Enclosure

Andrew D. MacInnes
Operating Director (Acting),
National Ecosystem Restoration
Planning Center of Expertise

CF:
CESWD-SWD-PDP (Hughes, Kruse)
CECW-SWD (Williams)
CESWF-PM-C (McCoy)
CESWF-PER-PF (Skalbeck)
CEMVD-PD (Young, Mallard)
CEMVD-PD-L (Miller)
CEMVP-PD-F (Mesko)