



**DEPARTMENT OF THE ARMY**  
U.S. ARMY CORPS OF ENGINEERS, SOUTH ATLANTIC DIVISION  
60 FORSYTH STREET SW, ROOM 10M15  
ATLANTA, GA 30303-8801

CESAD-RBT

31 October 2019

MEMORANDUM FOR Commander, Jacksonville District, 701 San Marco Boulevard,  
Jacksonville, Florida 32207

SUBJECT: Approval of the Review Plan for Everglades Agricultural Area, A-2 Reservoir Project

1. References:

a. Memorandum, CESAJ-EN-Q, 14 August 2019, subject as above.

b. Engineering Circular (EC) 1165-2-217, Water Resources Policies and Authorities Review Policy for Civil Works, 20 February 2018.

2. The Review Plan (RP) for Everglades Agricultural Area, A-2 Reservoir Project submitted by the Jacksonville District via reference 1.a. noted above has been reviewed by South Atlantic Division (SAD). The RP was coordinated with and endorsed by the Risk Management Center (RMC). The RP is hereby approved in accordance with reference 1.b.

3. The USACE RMC shall be the Review Management Organization (RMO) for this project.

4. SAD concurs with the District's RP recommendation that outlines the requirements for District Quality Control (DQC), Agency Technical Review (ATR), and Biddability, Constructability, Operability, Environmental and Sustainability (BCOES) Review, and the conclusion and recommendation that a Safety Assurance Review/Type II Independent External Peer Review is required.

5. The District should take steps to post the approved RP to its website and provide a link to CESAD-RBT. Before posting to the website, the names of Corps/Army employees should be removed. Subsequent significant changes to this RP, such as scope or level of review changes, should they become necessary, will require new written approval from this office.

6. The SAD point of contact is [REDACTED].

[REDACTED]  
Major General, USA  
Commanding



DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT  
701 SAN MARCO BOULEVARD  
JACKSONVILLE, FLORIDA 32207-8915

CESAJ-EN-Q

MEMORANDUM FOR Commander, South Atlantic Division (CESAD-RBT), 60 Forsyth Street SW, Room 10M15, Atlanta, GA 30303

SUBJECT: Approval of Review Plan for Section 408 Permission Package for Central Everglades Planning Project New Water – Everglades Agricultural Area – Stormwater Treatment Area Project, Palm Beach County, Florida

1. References.

- a. Engineering Circular (EC) 1165-2-217, Review Policy for Civil Works, 20 Feb 18.
- b. Flood Control Act of 1946, Public Law 79-526, 24 Jul 46.

2. CESAJ- EN has reviewed the Review Plan for the Section 408 Permission Package Central Everglades Planning Project New Water – Everglades Agricultural Area – Stormwater Treatment Area Project, Palm Beach County, Florida, and concurs that this Review Plan provides for an adequate level of review and complies with the current policy requirements outlined in EC 1165-2-216.

3. This Review Plan was prepared by the South Florida Water Management District (SFWMD), reviewed by Jacksonville District and the South Atlantic Division, and all review comments have been satisfactorily resolved.

4. The design for this project is under development by the SFWMD and their A-E who will perform quality checks on all products they developed. This Review Plan outlines the Jacksonville District-led Agency Technical Review of the submitted 408 permission package. Documents to be reviewed include plans, specifications, and a design documentation report.

5. The district will post the CESAD approved Review Plan to its website and provide a link to the CESAD for its use. Names of Corps/Army employees will be withheld from the posted version, in accordance with guidance.

6. If you have any questions regarding the information in this memo, please feel free to contact me or contact [REDACTED].

Encl

[REDACTED]  
COL, EN  
Commanding



US Army Corps  
of Engineers®

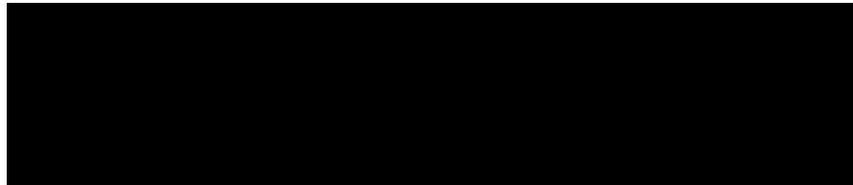
Prepared by:

**Jacksonville District  
South Atlantic Division**

## Everglades Agricultural Area, A-2 Reservoir Project

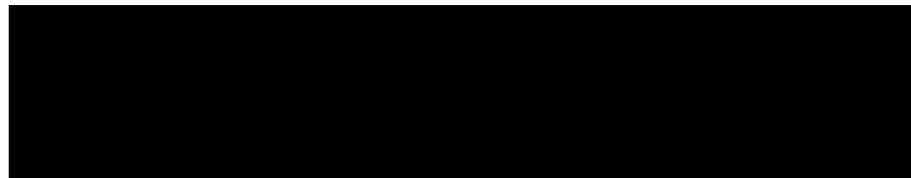
### Review Plan

PREPARED  
BY:



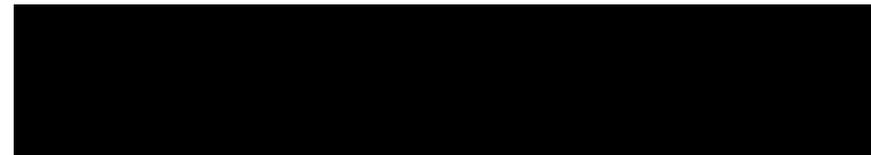
Civil Section, Engineering Division  
USACE, Jacksonville District

REVIEWED  
BY:



Chief, Engineering Division  
USACE, Jacksonville District

ENDORSED  
BY:



Chief, Eastern Division  
USACE, Risk Management Center

**Approval Date: *Pending***  
**Last Revision Date: *9 August 2019***

This information is distributed solely for the purpose of pre-dissemination review under applicable information quality guidelines. It has not been formally disseminated by USACE. It does not represent and should not be construed to represent any agency determination or policy.

# Section 1

## Introduction

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### 1.1 Purpose

This Review Plan (RP) for the Everglades Agricultural Area, A-2 Reservoir Project (P2 # 370939), will help ensure a quality-engineering project is developed by the Corps of Engineers in accordance with EC 1165-2-217, "Review Policy for Civil Works." As part of the Project Management Plan this RP establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products and lays out a value added process and describes the scope of review for the current phase of work. The EC outlines five general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Biddability, Constructability, Operability, and Sustainability (BCOES) Review, Independent External Peer Review (IEPR), and Policy and Legal Compliance Review. This RP will be provided to Project Delivery Team (PDT), DQC, ATR, BCOES, and IEPR Teams. The technical review efforts addressed in this RP, DQC and ATR, are to augment and complement the policy review processes. The District Chief of Engineering has assessed that the life safety risk of this project is significant; therefore, a Type II IEPR/Safety Assurance Review (SAR) will be required, see Paragraph 5.1. Any levels of review not performed in accordance with EC 1165-2-217 will require documentation in the RP of the risk-informed decision not to undertake that level of review.

### 1.2 References

- EC 1165-2-217, Review Policy For Civil Works, 20 February 2018
- ER 1110-1-12, Quality Management, 31 March 2011
- ER 415-1-11, Biddability, Constructability, Operability, Environmental and Sustainability (BCOES) Reviews, 1 January 2013
- ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 August 1999
- ER 1110-2-1156, Safety of Dams – Policy and Procedure, 31 March 2014
- ER 1110-2-1302, Civil Works Cost Engineering, 30 June 2016
- Central Everglades Planning Project, Final Integrated Project Implementation Report and EIS, December 2014
- Central Everglades Planning Project, Post Authorization Change Report, Feasibility Study and Draft EIS, March 2018

### 1.3 Review Management Organization

The USACE Risk Management Center (RMC) is the Review Management Organization (RMO) for this project.

## Section 2

# Project Description

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### 2.1 Project Description

The Central Everglades Planning Project (CEPP) is encompassed in the Comprehensive Everglades Restoration Plan (CERP), which was approved by Congress as a framework for the restoration of the natural system under Section 601 of the Water Resources Development Act of 2000 (WRDA 2000). The CERP, as documented in the 1999 Central and Southern Florida (C&SF) Project Comprehensive Review Study Final Integrated Feasibility Report and Programmatic Environmental Impact Statement (Yellow Book), consists of 68 different components. The purpose of the CERP is to modify structural and operational components of the C&SF Project to achieve restoration of the Everglades and the south Florida ecosystem, while providing for other water-related needs such as urban and agricultural water supply and flood protection. The 68 components identified in the Yellow Book will work together to benefit the ecological structure and function of more than 2.4 million acres of the south Florida ecosystem by improving and/or restoring the proper quantity, quality, timing and distribution of water in the natural system. The CERP will also address other concerns such as urban and agricultural water supply and maintain existing levels of service for flood protection in those areas served by the project. The CERP components were originally planned for implementation over an approximate 40 year period. The CERP is designed to achieve more natural flows by re-directing current flows that are currently discharged to the Atlantic Ocean and Gulf of Mexico, to a more restored flow of water that is distributed throughout the system similar to pre-drainage conditions.

Since the CERP was approved, three projects were authorized in the 2007 WRDA and proceeded into construction (Indian River Lagoon-South, Picayune Strand, and Site 1 Impoundment) and a fourth project, Melaleuca and Other Exotic Plants Biological Controls, was implemented under the programmatic authority in WRDA 2000. Despite this progress, ecological conditions and functions within the central portion of the Everglades ridge and slough community continue to decline due to lack of sufficient quantities of freshwater flow into the central Everglades and timing and distribution problems. To respond to this concern, the U.S. Army Corps of Engineers (USACE) and the South Florida Water Management District (SFWMD) initiated the CEPP in November 2011 to evaluate alternatives for restoring ecosystem conditions in the central portion of the Everglades and opportunities for providing for other water-related needs in the region.

The purpose of the CEPP is to improve the quantity, quality, timing and distribution of water flows to the Northern Estuaries, central Everglades (Water Conservation Area 3 [WCA 3] and Everglades National Park [ENP]), and Florida Bay while increasing water supply for municipal, industrial and agricultural users. Too much water from Lake Okeechobee during the wet season, and too little water during the dry season impacts salinity levels within the Northern Estuaries, stressing estuarine ecosystems.

Construction and operation of the WCAs compartmentalized a significant extent of the historical Everglades landscape and in turn degraded the structure and function of the remaining system. As a result, the Everglades are approximately half their original size, water tables are lowered, wetlands altered, freshwater flows diverted, water quality degraded, and habitats invaded by non-native plants and animals. All of these impacts are caused directly or indirectly by changes in hydrology. Changes in hydrology have led to the degradation of the historic slough, tree-island and sawgrass mosaic that previously characterized much of the study area, as well as the marl prairies that exist in the southern portion of the area in ENP. The changes in the landscape pattern have had adverse effects on wildlife. Changes in hydrology of the freshwater systems have led to effects on the estuarine and marine environments of Florida Bay. Alterations in seasonal inflow deliveries to Florida Bay have resulted in extreme salinity fluctuations. The already degraded state of the Everglades will continue to worsen in the absence of increased water

deliveries, improved water timing and restored distribution. Redirecting a portion of the approximately 1.7 billion gallons of water per day on average that is discharged to the Atlantic Ocean and the Gulf of Mexico is essential to meeting the quantity, quality, timing and distribution of water required to realize a portion of the benefits envisioned in the CERP.

SFWMD, as local sponsor for the authorized CEPP plan, prepared a Post Authorization Change Report (PACR) Integrated Feasibility Study and Draft Environmental Impact Statement (FS/DEIS) for a tentatively selected plan (TSP) to increase the amount of water storage and treatment in the currently authorized CEPP plan. CEPP was authorized by Congress in the 2016 Water Infrastructure Improvements for the Nation Act, which includes the Water Resources Development Act (WRDA) of 2016 as Title I. The CEPP PACR was prepared by the SFWMD under the authority provided by Section 203 of WRDA 1986, as amended and in accordance with USACE regulations and guidance. Section 203 provides that a non-Federal interest can submit a completed feasibility study to the Assistant Secretary of the Army for Civil Works for review to determine if the study, and the process under which it was developed, comply with Federal laws and regulations applicable to feasibility studies of water resources development projects.

The proposed modification to the CEPP Plan addressed in the CEPP PACR is construction of a 240,000 acre-feet (ac-ft) reservoir (A-2 reservoir) with multi-purpose operational flexibility on an area of 10,500 acres, a 6,500-acre Stormwater Treatment Area (STA), and conveyance improvements in lieu of the currently authorized A-2 Flow Equalization Basin (with a capacity of approximately 56,000 ac-ft).

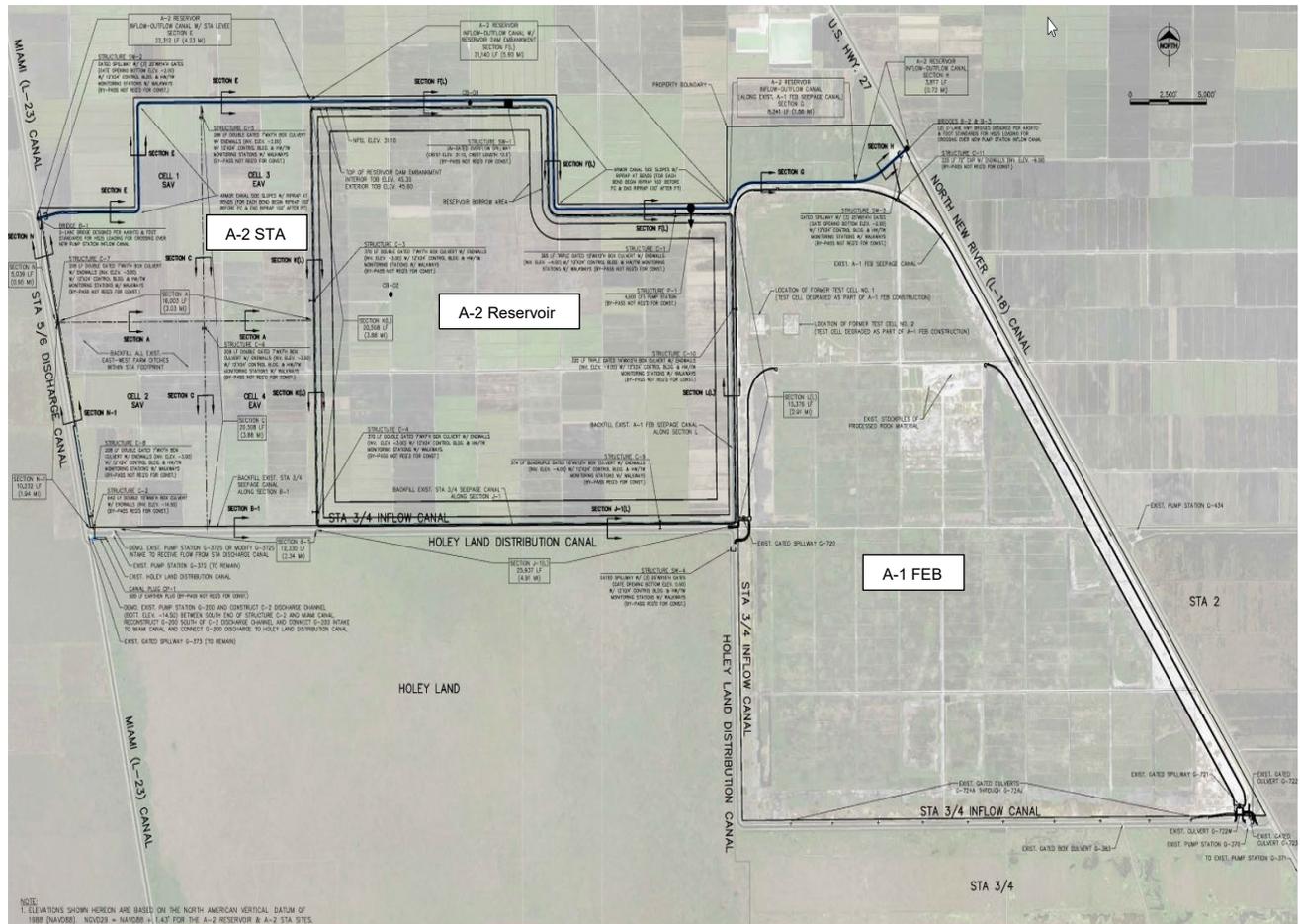


Figure 1. Site Plan (CEPP PACR, March 2018)

## 2.2 Project Sponsor & Feature Delineation

The South Florida Water Management District is the non-Federal sponsor for the project. Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, policy and legal compliance, BCOES, and SAR reviews. Sponsor Peer Review of In-Kind Contributions: There will be in-kind contributions for this effort that will undergo peer review.

Project features have been separated from the SFWMD PACR and delineated as follows:

1. The A-2 STA and all associated features will be designed and constructed by the SFWMD. They are:
  - a. Approximately 8.5 miles of open channel
  - b. Approximately 13 miles of perimeter embankment
  - c. Approximately 8 gated water control structures
  - d. Approximately 5 miles of interior embankment (divides STA cells)
  - e. A 650 cfs inflow pumping station (temporary)
  - f. Two gated spillways
  - g. One U.S. Highway Bridge
  
2. The A-2 Reservoir and all associated features will be designed and constructed by the USACE Jacksonville District (SAJ). They are:
  - a. Approximately 8 miles of open channel
  - b. Approximately 18 miles of zoned embankment (approximately 37 ft high)
  - c. Approximately 18 miles of soil cement-bentonite cutoff wall (40-65 ft below grade)
  - d. Four gated outlet work structures
  - e. One gated spillway
  - f. One Pumping Station (4,600 cfs approximate capacity)
  - g. Two U.S. Highway Bridges

Those features to be designed and constructed by the USACE Jacksonville District have been further sub-divided into three (3) distinct design products as follows:

- a. Architect – Engineer Contract 1 (AE Cnt 1) – Approximately 8 miles of open channel, One gated Spillway, and Two U.S. 27 Hwy Bridges
- b. Architect – Engineer Contract 2 (AE Cnt 2) – One Pumping Station (4,600 cfs approximate capacity)
- c. SAJ design – Approximately 18 miles of zoned embankment (approximately 37 ft high), Approximately 18 miles of soil cement-bentonite cutoff wall (40-65 ft below grade), and four (4) gated outlet work structures.

This RP covers the A-2 Reservoir and sub-divided design products: AE Cnt 1, AE Cnt 2 and SAJ design. Everglades Agricultural Area (EAA) A-2 STA project and all associated features were covered by a previously approved RP.

## Section 3

# District Quality Control

### 3.1 Requirements

All implementation documents (including supporting data, analyses, reports, environmental compliance documents, water control manuals, etc.) shall undergo DQC in accordance with EC 1165-2-217. The A-E shall prepare and submit for Government review and approval, a Quality Control Plan that includes a design delivery schedule and the quality control team. SAJ shall perform Quality Assurance Review (QAR) in accordance with District Quality Control (DQC) activities for engineering products stipulated in ER 1110-1-12, Engineering & Design Quality Management and EC 1165-2-209. DQC will be performed on the Plans & Specifications (P&S), DDR, Updated Dam Breach Modeling, and Semi-Quantitative Risk Assessment in accordance with CESAJ Engineering Division Quality Management System (EN QMS) by SAJ. The EN QMS defines DQC as the sum of two (2) reviews, Discipline Quality Control Review (DQCR) and Product Quality Control Review (PQCR). Product Quality Control Review is the DQC Certification that will precede ATR. The following EN QMS Procedures define related DQC activities for CESAJ-EN, see Attachment 4.

See Attachment 1, Table 6 for the DQC Lead, reviewers, and reviewer's disciplines.

### 3.2 Documentation

Documentation of DQC activities is required and will be implemented by the process described in paragraph 3.1.

### 3.3 DQC Schedule and Estimated Cost

Although DQC is always seamless, the following milestone reviews are scheduled in Table 1. The cost for each DQC is approximately \$30,000 - \$45,000.

Project Phase/Submittal	Review Start Date	Review End Date
DQC Preliminary (30%) P&S Review – AE Cnt 1	May 2020	June 2020
DQC Preliminary (30%) P&S Review – AE Cnt 2	July 2020	August 2020
DQC Preliminary (30%) P&S Review – SAJ design	July 2020	August 2020
DQC Intermediate (60%) P&S Review – AE Cnt 1	January 2021	March 2021
DQC Intermediate (60%) P&S Review – AE Cnt 2	May 2021	June 2021
DQC Intermediate (60%) P&S Review – SAJ design	April 2021	June 2021
DQC Final P&S Review – AE Cnt 1	June 2021	Aug 2021
DQC Final P&S Review – AE Cnt 2	November 2021	December 2021

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DQC Final P&S Review – SAJ design	December 2021	February 2022
DQC Updated Dam Breach Model – SAJ design	June 2021	June 2021
DQC Semi-Quantitative Risk Assessment (SQRA) – SAJ design	September 2021	October 2021

*Table 1 DQC Schedule*

## Section 4

# Agency Technical Review

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### 4.1 Requirements

All implementation documents (including supporting data, analyses, reports, environmental compliance documents, water control manuals, etc.) shall undergo ATR in accordance EC 1165-2-217. ATR reviews will occur seamlessly, including early involvement of the ATR team for validation of key design decisions, and at the scheduled milestones as shown in Section 4.6. A site visit will be scheduled for the ATR Team.

### 4.2 Documentation of ATR

Documentation of ATR will occur using the requirements of EC 1165-2-217. This includes the four part comment structure and the use of DrChecks<sup>SM</sup>.

### 4.3 Products to Undergo ATR

The ATR Team will review the Intermediate (60%) and Final (100%) Plans & Specs along with the Intermediate (60%) and Final (100%) DDR for all project components of the A-2 Reservoir, to include those products designed by A-E Firm(s). In addition, the ATR team will review an updated dam breach model and report as well as the Semi-Quantitative Risk Assessment (SQRA) report. All ATR reviews and tentative time frames are outlined in Table 2.

### 4.4 Required Team Expertise and Requirements

ATR teams will be established in accordance with EC 1165-2-217. The following disciplines will be required for ATR of this project:

**ATR Lead:** The ATR team lead is a senior professional outside the home MSC with extensive experience in preparing Civil Works documents and conducting ATRs. The lead has 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.

**Civil Engineer** – The ATR member shall be a senior level, professionally registered engineer with extensive experience with civil/site work projects to include earthen channels, embankments, road and highway, relocations, paving and drainage. The Civil Engineer reviewer should have a minimum of 10 years of experience.

**Construction Engineer** – The ATR member shall be a senior level, professionally registered engineer with extensive experience in the engineering construction field with particular emphasis on dam safety projects. The Construction reviewer should have a minimum of 10 years of experience.

**Electrical Engineer** – The ATR member should be a senior level, professionally registered engineer with extensive experience with engineering design of flood risk management and ecosystem restoration project features such as water control structures, related systems and components. The Electrical Engineer reviewer should have a minimum of 10 years of experience.

**Engineering Geologist** – The ATR member shall have experience in assessing internal erosion (seepage and piping) beneath (Insert type ex. mass concrete) dams constructed on (Insert project specific ex. bedrock) formations. The engineering geologist shall be familiar with identification of geological hazards, exploration techniques, field and laboratory testing, and instrumentation. The engineering geologist shall be experienced in the design of grout curtains and must be knowledgeable in grout theology, concrete mix designs, and other materials used in foundation seepage barriers.

**Geotechnical Engineer** – The ATR member shall have experience in the field of geotechnical engineering, analysis, design, and construction of (Insert type ex. mass concrete) dams. The geotechnical engineer shall have experience in subsurface investigations, rock and soil mechanics, internal erosion (seepage and piping), slope stability evaluations, erosion protection design, and earthwork construction. The geotechnical engineer shall have knowledge and experience in the forensic investigation of seepage, settlement, stability, and deformation problems associated with high head dams and appurtenances constructed on rock and soil foundations.

**Hydraulic Engineer** – The ATR member shall have experience in the analysis and design of hydraulic structures related to dams including the design of hydraulic structures (e.g., spillways, outlet works, and stilling basins). The hydraulic engineer shall be knowledgeable and experienced with the routing of inflow hydrographs through multipurpose flood control reservoirs utilizing multiple discharge devices, Corps application of risk and uncertainty analyses in flood damage reduction studies, and standard Corps hydrologic and hydraulic computer models used in drawdown studies, dam break inundation studies, hydrologic modeling and analysis for dam safety investigations.

**Mechanical Engineer** – The ATR member shall have experience in machine design, machine rehabilitation and familiarity with design of mechanical gates and controls for flood control structures.

**Structural Engineer** – The ATR member shall have experience and be proficient in performing stability analysis, finite element analysis, seismic time history studies, and external stability analysis including foundations on high head mass concrete dams. The structural engineer shall have specialized experience in the design, construction and analysis of concrete dams.

## 4.5 Statement of Technical Review Report

At the conclusion of each ATR effort, the ATR team will prepare a review report with a completion and certification memo. The report will be prepared in accordance with EC 1165-2-217.

## 4.6 ATR Schedule and Estimated Cost

Although ATR is always seamless, the preliminary ATR milestone schedule is listed in Table 2. The cost for each ATR is approximately \$25,000 to \$35,000.

Project Phase/Submittal	Review Start Date	Review End Date
ATR Intermediate (60%) P&S Review – AE Cnt 1	March 2021	April 2021
ATR Intermediate (60%) P&S Review – AE Cnt 2	July 2021	August 2021
ATR Intermediate (60%) P&S Review – SAJ design	June 2021	August 2021
ATR Final P&S Review – AE Cnt 1	August 2021	September 2021

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ATR Final P&S Review – AE Cnt 2	January 2022	February 2022
ATR Final P&S Review – SAJ design	February 2022	April 2022
ATR Updated Dam Breach Model	July 2021	July 2021
ATR Semi-Quantitative Risk Assessment (SQRA)	October 2021	November 2021

*Table 2 ATR Schedule*

## Section 5

# Safety Assurance Review

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### 5.1 Decision on SAR

The District Chief of Engineering has made a risk-informed-decision that this project poses a significant threat to human life (public safety) and therefore a SAR will be performed. This decision is due to the volume (240,000 ac-ft) of water anticipated to be stored in the above ground reservoir feature of this project where a breach would pose a threat to human life and cause significant economic damage of the surrounding area. The facility has been categorized as a high hazard impoundment (major impoundment), as specified in the Federal Emergency Management Agency's *Selecting and Accommodating Inflow Design Floods for Dams* (FEMA 2013) and *Central Everglades Restoration Project – Design Criteria Memorandum-1: Hazard Potential Classification* (DCM-1) (Haapala et al. 2005) guidelines.

### 5.2 Products to Undergo SAR

The SAR panel will review the Intermediate (60%) Plans, Specifications, and DDR relevant to the A-2 Reservoir Embankment design. Major features will consist of:

- Zoned embankment
- Chimney drain & filtered exit
- Soil Cement Bentonite Cutoff Wall
- Outlet Work Structures
- Emergency Overflow Spillway(s)

### 5.3 Required SAR Panel Expertise

SAR panels will be established in accordance with EC 1165-2-217. The following disciplines will be required for SAR of this project:

**Civil Engineer** – The Panel Member shall be a senior level, professionally registered engineer with extensive experience with civil/site work projects to include earthen channels, embankments, road and highway, relocations, paving and drainage.

**Construction Engineer** – The Panel Member shall be a senior level, professionally registered engineer with extensive experience in the engineering construction field with particular emphasis on dam safety and earthwork projects.

**Electrical Engineer** – The Panel Member shall be a senior level, professionally registered engineer with extensive experience with electrical engineering design of flood risk management and ecosystem restoration project features such as water control structures, related systems and components.

**Engineering Geologist** - The Engineering Geologist panel member shall be a senior-level geologist familiar with identification of geological hazards, exploration techniques, field and laboratory testing, and instrumentation. The Panel Member should be proficient in assessing seepage and piping through and beneath dams constructed on fractured and faulted rock, karstic rock, or within various geologic environments, including but not limited to alluvial (including open-work gravels) and colluvial (including boulders and cobbles) materials. The Panel Member should be experienced in the design and construction of seepage barriers or cutoff walls.

**Geotechnical Engineer** - The Geotechnical Engineering panel member shall be a senior-level geotechnical engineer with experience in the field of geotechnical engineering, analysis, design, and construction of embankment dams and levees. The Panel Member should have knowledge and experience in the forensic investigation and evaluation of seepage and piping, settlement, slope stability, and deformations problems associated with embankments constructed on weathered and jointed rock and alluvial soils. The Panel Member should have experience in the design and construction of seepage barriers or cutoff walls. The Panel Member should have experience in failure mode analysis, risk assessment of embankment dams, and evaluating risk reduction measures for dam safety assurance projects.

**Hydraulic Engineer** – The Panel Member shall have experience with engineering analysis related to flood risk management and dam safety projects. The Panel member will hold a degree in Civil Engineering, or Hydrology and Hydraulics Engineering. The Panel Member should have experience with unsteady flow dam failure analysis modeling. The Panel Member must demonstrate knowledge and experience with the routing of inflow hydrographs through multipurpose flood control reservoirs. Experience should emphasize modeling spillways and outlet works related to flood control reservoirs, particularly for large dams. Demonstrate experience in dealing with discharge being utilized at the individual flood control reservoir during a large flood event such as the Probable Maximum Flood (PMF).

**Mechanical Engineer** – The Panel Member shall be a senior level, professionally registered engineer with extensive experience with machine design, machine rehabilitation, design of mechanical gates, and controls for flood control structures.

**Structural Engineer** – The Panel Member shall have experience and be proficient in performing stability analysis, finite element analysis, and external stability analysis including foundations on earth fill dams. The structural engineer shall have specialized experience in the design, construction and analysis of earth fill dams.

## 5.4 Documentation of SAR

Documentation of SAR will be prepared in accordance with EC 1165-2-217.

## 5.5 Scope, Schedule, and Estimated Cost of SAR's

The SARs will be performed in accordance with EC 1165-2-217. SAR reviews will occur at the Intermediate (60%) Plans, Specifications, and DDR relevant to the A-2 Reservoir Embankment design as shown in Table 3. The estimated cost for the SARs for this project are in the range of \$40,000 to \$60,000. This estimate will be refined when the Scope of Work for the SAR task order is completed.

<b>Milestone Reviews</b>	<b>Geotech</b>	<b>Geologist</b>	<b>H&amp;H</b>	<b>Structural</b>	<b>Construction</b>	<b>Civil</b>	<b>Mechanical</b>	<b>Electrical</b>	<b>Site Visit Duration (days)</b>	<b>Review Start Date</b>	<b>Review End Date</b>
Intermediate (60%) P&S and DDR	X	X	X	X	X	X	X	X	0	June 2021	August 2021

*Table 3 Scheduled Milestone Reviews with Required Reviewers and Site Visit Duration*

## Section 6

# Public Posting of Review Plan

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As required by EC 1165-2-220, the approved RP will be posted on the District public website (<https://www.saj.usace.army.mil/Missions/Civil-Works/Review-Plans/>).z This is not a formal comment period and there is no set timeframe for the opportunity for public comment. If and when comments are received, the PDT will consider them and decide if revisions to the RP are necessary.

## Section 7

# Review Plan Approval and Updates

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The Major Subordinate Command (MSC) Commander, or delegated official, is responsible for approving this RP. The Commander's approval reflects vertical team input (involving the District, MSC, and RMC) as to the appropriate scope, level of review, and endorsement by the RMC. The RP is a living document and should be updated in accordance with 1165-2-217. All changes made to the approved RP will be documented in Attachment 3, Table 9 RP Revisions. The latest version of the RP, along with the Commander's approval memorandum, will be posted on the District's webpage and linked to the HQUSACE webpage. The approved RP should be provided to the RMO.

## Section 8

# Engineering Models

The use of certified, validated, or agency approved engineering models is required for all activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. 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. 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, BCOES, policy and legal review, and SAR (if required). Where such approvals have not been completed, appropriate independent checks of critical calculations will be performed and documented. The following engineering models, software, and tools are anticipated to be used:

Model Name	Version
HEC-RAS	5.0.7
HY-8	7.5
LEAP Conspan	12.01.00.57
LEAP Bridge Enterprise	14.00.00.19
LEAP Bridge Steel	18.00.00.31
LEAP Bridge Concrete	18.00.00.34
RAM Connection	12.00.01.040
RAM Elements	15.00.00.18
STAAD Foundation	05.03.00.14
STAAD Pro	21.03.00.146
CWALSHT	11.09.2007
LPILE	2019.11.1.0
GeoStudio 2018 R2	9.1.1.16749
GeoStudio 2019	10.0.0.17401
WASH123D (GMS Platform)	9.0

*Table 4 Models and Status*

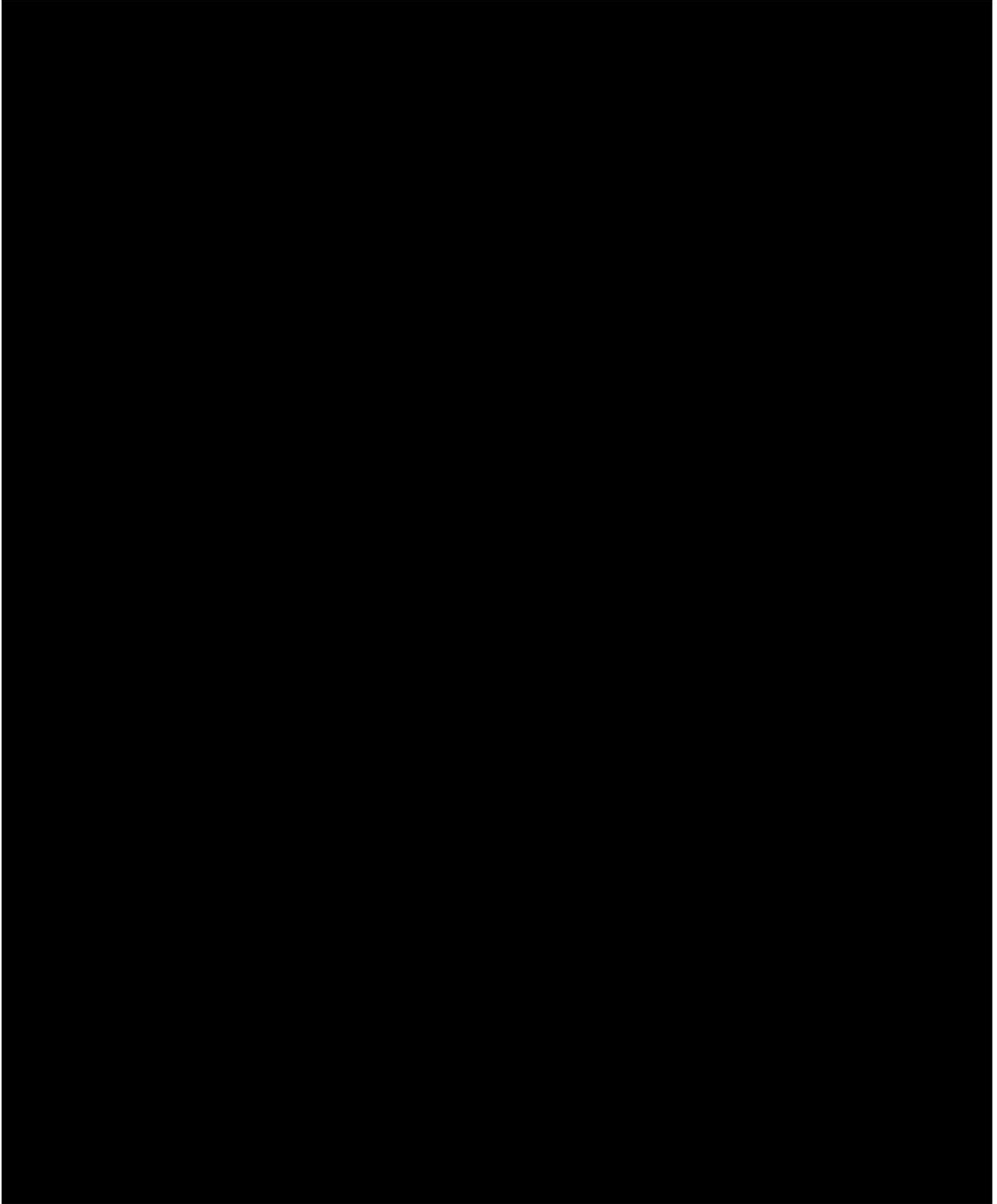
## Section 9

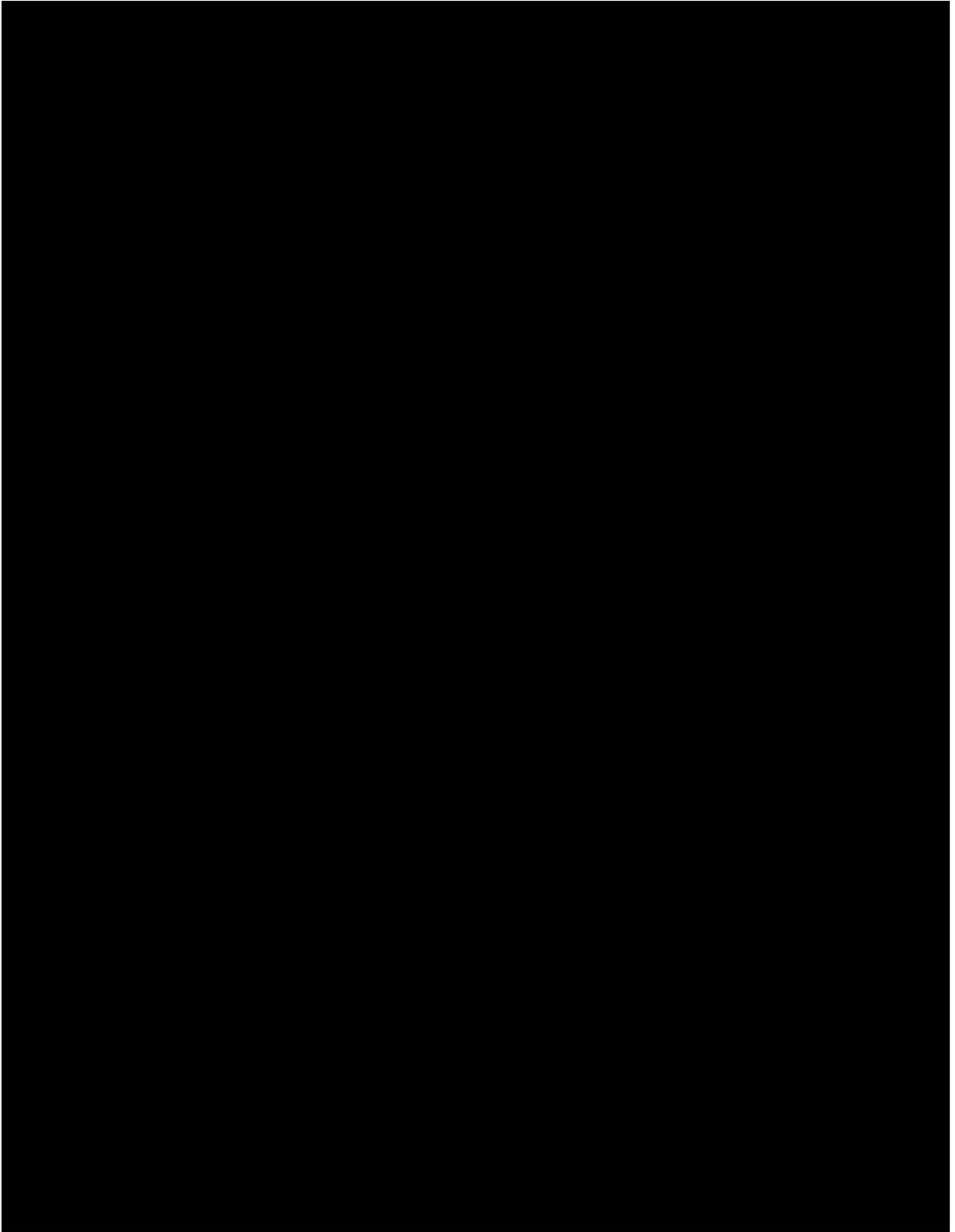
# Review Plan Points of Contact

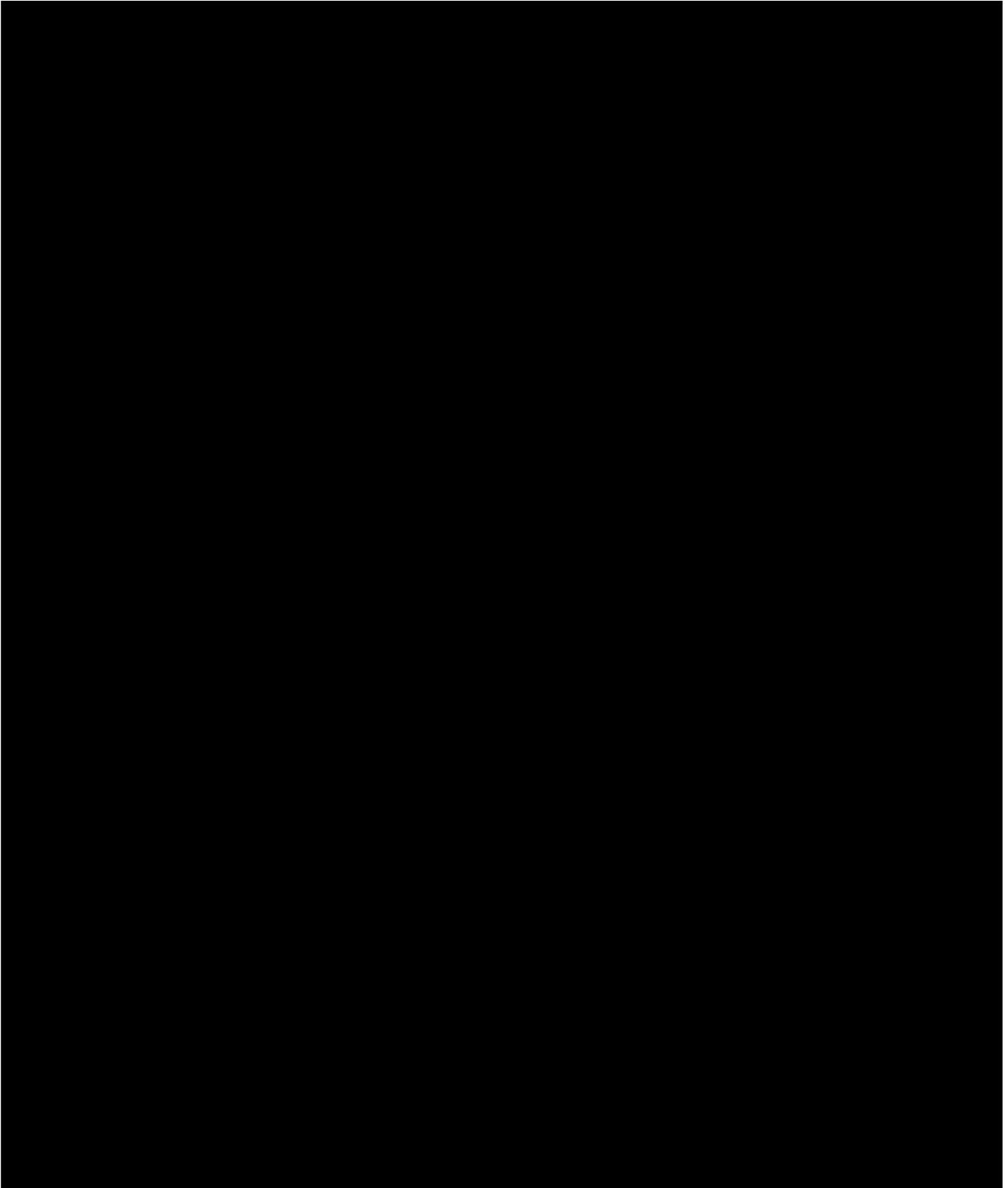
Name & Title	Organization	Phone
[REDACTED]	CESAJ-EN-Q	[REDACTED]
[REDACTED]	CESAJ-EN-DL	[REDACTED]
[REDACTED]	CEIWR-RMC-W	[REDACTED]

*Table 5 RP POC's*

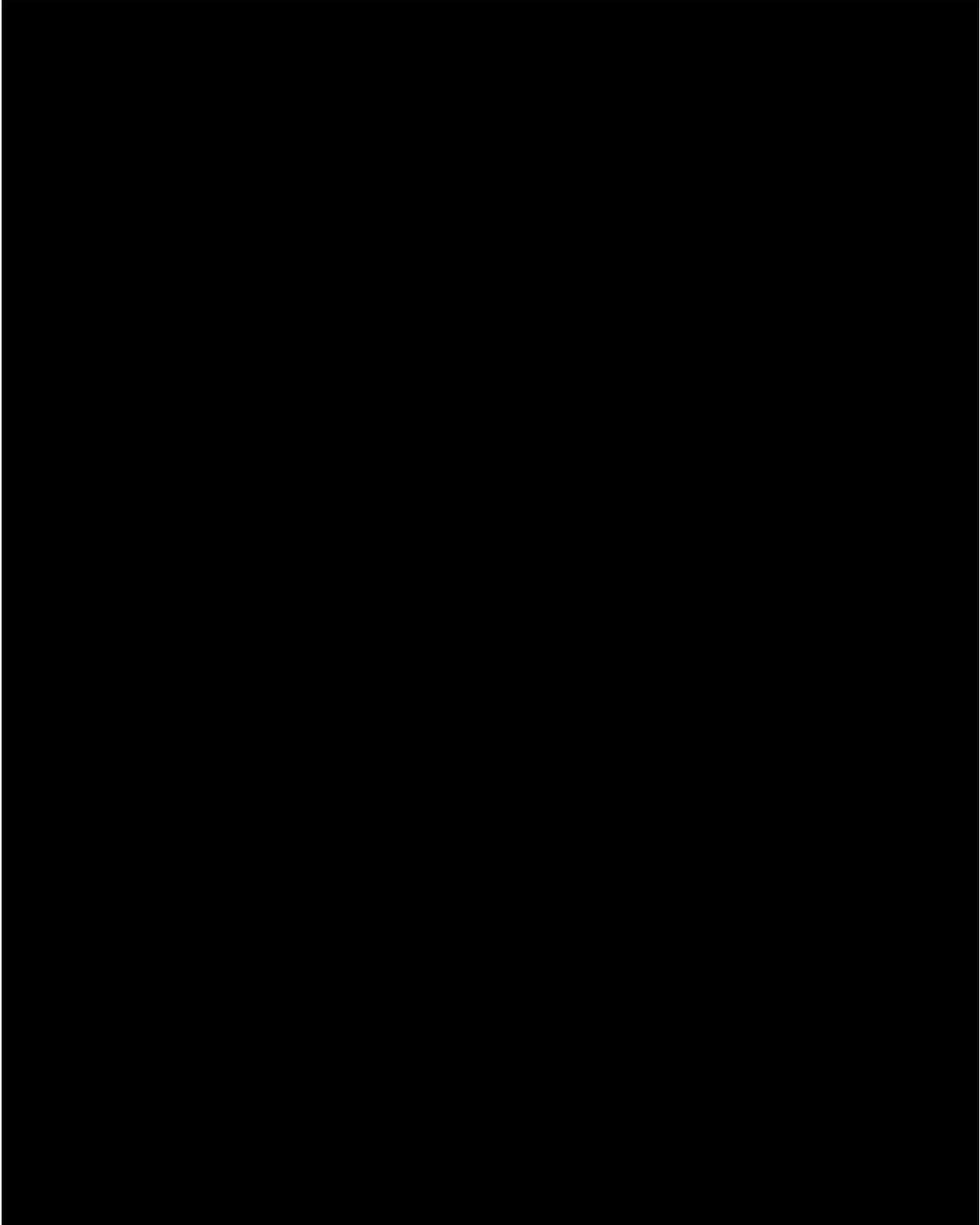
## ATTACHMENT 1

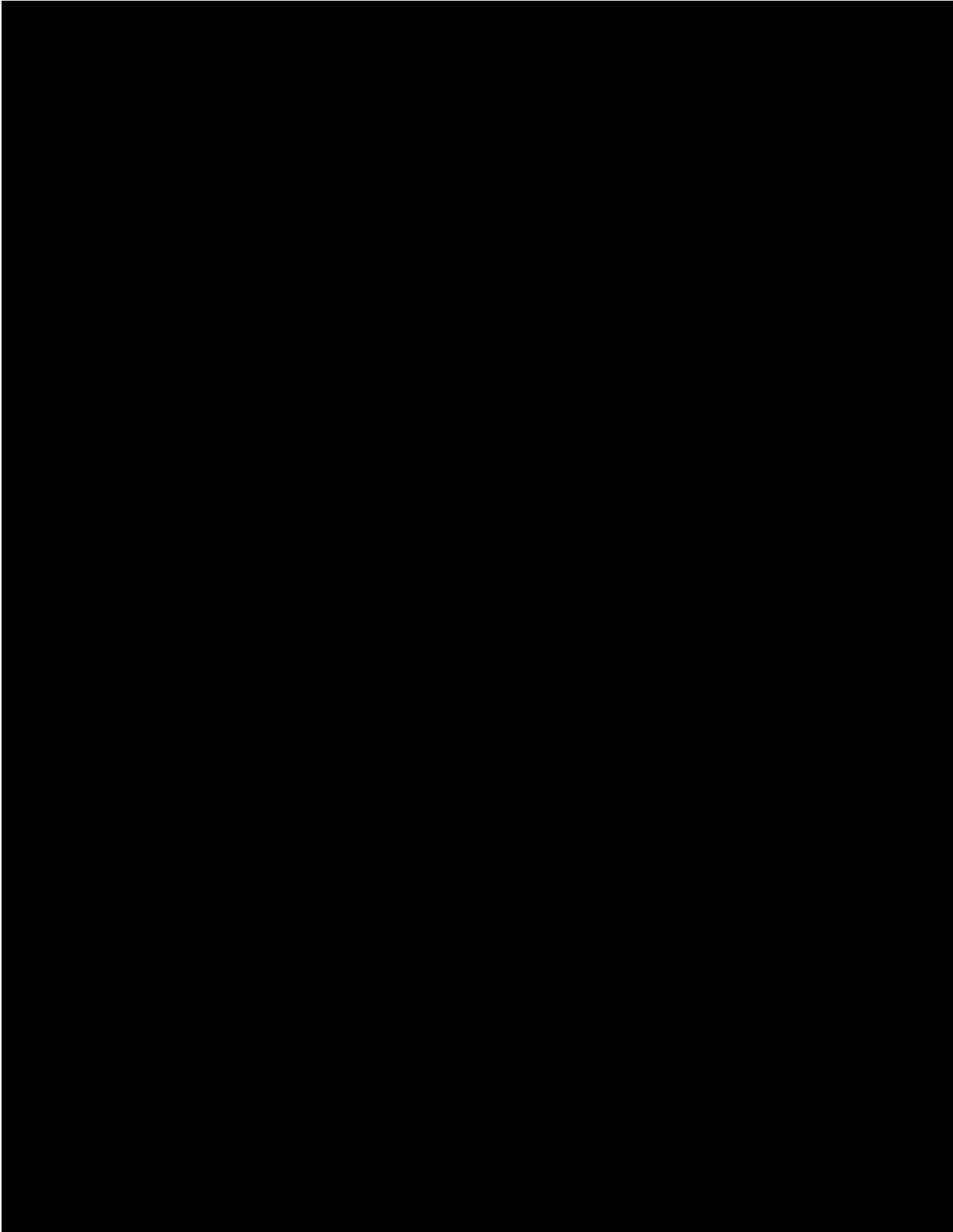


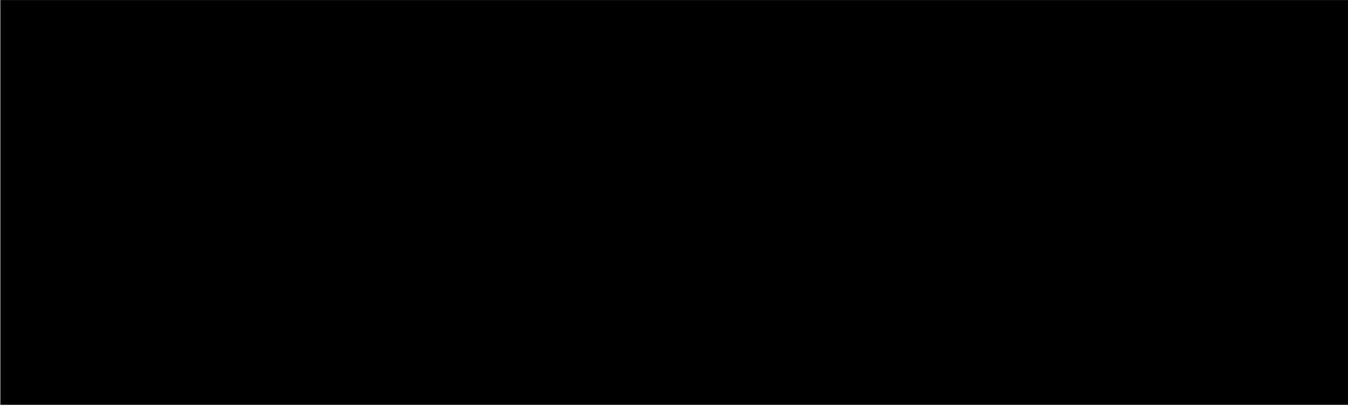




## ATTACHMENT 2







# ATTACHMENT 3

## Review Plan Revisions

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Revision Date	Description of Change	Page/Paragraph Number

*Table 9 RP Revisions*

**ATTACHMENT 4**

**02611-SAJ EN Quality Control of In-  
House Products: Civil Products**

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 <p><b>US Army Corps of Engineers</b></p>	<p><b>02611-SAJ EN</b></p> <p><b>Quality Control of In-House Products: Civil Works</b></p>	
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**1.0 Purpose.** This process outlines the US Army Corps of Engineers (USACE) Jacksonville District (SAJ) Engineering Division (EN) procedures for ensuring quality of designs, specifications, Operations and Maintenance (O&M) requirements, etc for Civil Works products developed in-house.

**2.0 Applicability.** This process applies to all EN Employees responsible for Civil Works products developed in-house. This process applies to these Civil Works products as outlined in the approved Review Plan (RP) regardless of the current project phase. This process does not apply to Employees outside of EN.

### 3.0 References.

ER 415-1-11, Biddability, Constructability, Operability, Environmental and Sustainability (BCOES) Reviews

ER 1105-2-100, Planning Guidance Notebook

ER 1110-1-12, Quality Management

ER 1110-2-1150, Engineering and Design for Civil Works Products

EC 1165-2-214, Civil Works Review

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#### 4.0 Related Procedures.

02612-SAJ EN Quality Assurance of Outside Resource Products: Civil Works

02630-SAJ EN Work Flow and Submittal Requirements for Plans and Specifications

02710-SAJ EN Preparation and Submittal of Civil Works Review Plans

02711-SAJ EN Preparation and Submittal of Civil Works Quality Control Plans and Quality Assurance Plans

02820-SAJ EN Schedule Development and Monitoring

08500-SAJ EN Engineering Checklists

**5.0 Definitions.** See “QMS001 Enterprise Standard (ES) - Glossary”, “QMS001 SAJ EN - Glossary”, and “EC 1165-2-214, Civil Works Review” for definitions and acronyms.

#### 6.0 Responsibilities.

**Other Division Chiefs.** Other Division Chiefs are responsible for certifying and endorsing that Biddability, Constructability, Operability, Environmental, and Sustainability (BCOES) Reviews are completed satisfactorily based on Division participation.

**Project Manager (PM).** The PM is responsible for:

- Developing the Quality Management Plan (QMP) for the Project Management Plan (PMP) or Program Management Plan (PgMP) in coordination with the Project Delivery Team (PDT) by obtaining timely input across SAJ.
- Supporting the Engineering Technical Lead (ETL) in preparing and executing EN RPs, Quality Control Plans (QCPs), and Quality Assurance Plans (QAPs).
- Ensuring the QMP and associated review activities (Agency Technical Review (ATR), Independent External Peer Review (IEPR), etc) are clearly defined, appropriately funded, and sufficiently scheduled allowing a thorough and complete review.
- Implementing the QMP and validating the execution with supporting documentation.
- Coordinating with the Review Management Organization (RMO) to define the review requirements and include the requirements in the RP.
- Coordinating with the RMO, ATR Team Leader, and applicable SAJ Division Chief to ensure that comments identified by the ATR Team have been resolved.

**EN Division Chief.** The EN Division Chief is responsible for certifying and endorsing that District Quality Control (DQC), ATR, IEPR, and BCOES Reviews are completed satisfactorily.

**EN Branch Chiefs.** The EN Branch Chiefs are responsible for:

- Certifying and endorsing that Discipline Quality Check and Review (DQCR) and Product Quality Control Review (PQCR) are completed satisfactorily to support DQC.
- Ensuring that ATR, IEPR, and BCOES Review comments are thoroughly addressed and incorporated into Branch products.
- Appointing members for PDT, DQCR, PQCR, and ATR Teams.

**EN Section Chiefs.** The Section Chiefs are responsible for:

- Overseeing DQCR and PQCR of Section products by directly participating on the team or assigning a senior level Employee on the team.
- Certifying and endorsing that DQCR and PQCR are completed satisfactorily to support DQC.
- Ensuring that ATR, IEPR, and BCOES Review comments are thoroughly addressed and incorporated into Section products.
- Recommending members for PDT, DQCR, PQCR, and ATR Teams to the Branch Chief.

**Engineering Technical Lead (ETL).** The ETL is responsible for:

- Preparing and executing the EN portions of the PMP including the QMP RP, QCP, and/or QAP.
- Collecting, reviewing, and compiling the EN portions of deliverable documents.
- Providing the final EN portions of deliverable documents or EN work products to the PM.
- Coordinating the EN PDT product reviews including DQCRs, PQCRs, ATRs, Customer, IEPRs, BCOES, and Policy and Legal Compliance Reviews.
- Coordinating the EN PDT in providing responses, completing actions, and ensuring updates resulting from comments to product reviews including DQCRs, PQCRs, ATRs, Customer, IEPRs, BCOES, and Policy and Legal Compliance Reviews.
- Scheduling and chairing comment review meetings with EN PDT members.
- Developing the Architect-Engineer (A-E) scope of work (SOW) for the IEPR task order.

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**Project Design Team (PDT).** The PDT members are responsible for:

- Managing DQCR of individual products and ensuring that the DQCR process is properly documented.
- Providing responses and completing actions resulting from comments to individual product reviews including DQCR, PQCR, ATR, Customer, IEPR, BCOES, and Policy and Legal Compliance Reviews.

**Design Branch (EN-D).** The Design Branch (EN-D) is responsible for serving as the Process Champion for this process document.

**Military/Interagency and International Services Specifications Section (EN-DC).** The Military/Interagency and International Services Specifications Section (EN-DC) is responsible for:

- Supporting the ETL in assembling review packages.
- Setting up PQCRs, ATRs, Customer Reviews, and BCOES Reviews in DrChecks in accordance with “02720-SAJ EN SAJ Utilization of ProjNet - DrChecks”.
- Compiling the Corrected Final – Ready to Advertise (RTA) Submittal and BCOES Certification Package and transmitting to Contracting Division (CT) for release.

**Architect-Engineer Contract Administration Section (EN-TA).** The Architect-Engineer Contract Administration Section (EN-TA) is responsible for:

- Supporting the ETL in developing and negotiating the A-E task order for IEPR.
- Issuing the A-E task order for IEPR.

**Quality Management Branch (EN-Q).** The Quality Management Branch (EN-Q) is responsible for maintaining a Review Manager and Quality Manager to oversee and support the PDT with completing and executing the QMP.

**Review Manager.** The Review Manager is responsible for:

- Coordinating, managing, and facilitating EN ATR and IEPR.
- Posting redacted documents to the public SAJ internet website including EN RPs, RP approval memorandums, and final IEPR reports.

**Quality Manager.** The Quality Manager is responsible for:

- Performing process and procedure measurements as outlined in the individual QMS processes.
- Issuing a bi-annual metric report documenting the results of independent audits and reviews.

## **7.0 Procedures.**

### **7.1 General Requirements - Quality Plans.**

7.1.1 Delivery of quality products and services requires an understanding of the following important quality management documents:

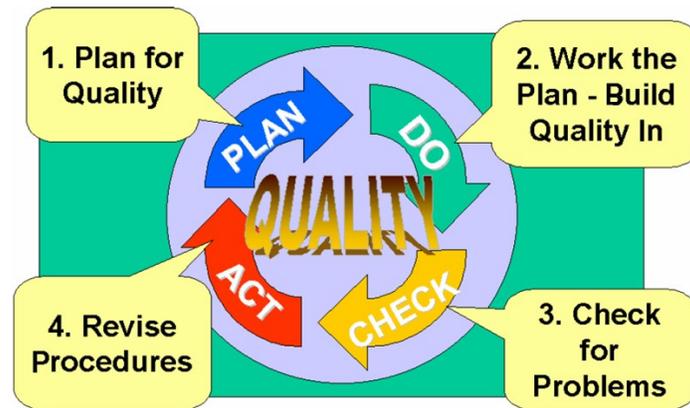
- Project Management Plan (PMP).
  - ✓ Required for the execution of all work.
  - ✓ Identifies the scope, schedule, and resources needed to accomplish the work.
  - ✓ Details how the project work items will be accomplished.
- Quality Management Plan (QMP).
  - ✓ The quality component of the PMP.
  - ✓ Documents the project-specific quality control (QC) and quality assurance (QA) procedures appropriate to the size, complexity, and nature of the project.
  - ✓ Identifies Project Sponsor quality objectives including thresholds and project specific requirements determined by SAJ.
  - ✓ Includes the RP which describes the scope of review for the current and/or upcoming phase of work.
  - ✓ Includes the QCP which is the QC component of the QMP and defines how QC will be executed for products and services.
  - ✓ Includes the QAP which is the QA component of the QMP and defines how QA will be executed for products and services that are completed by Outside Resources, including A-E contractors, USACE Districts, and USACE Centers.
  - ✓ Must be consistent with the organizational QMS unless otherwise documented.

7.1.2 The Plan-Do-Check-Act (PDCA) Cycle is the guiding quality management procedure for USACE business processes.

7.1.3 The PDCA Cycle steps include the following as shown in the figure below:

- Plan - Design the PMP to achieve customer requirements and provide for high quality products and services.
- Do - Implement the PMP, including the QCP and QAP.
- Check - Evaluate the project results.

- Act - Identify and implement process changes for continual improvement.



## 7.2 General Requirements - Levels of Review.

7.2.1 Design and technical review of work products is an iterative process including various levels of review to support overall quality.

- Reanalysis or significant changes resulting from this iterative process will undergo additional levels of review as determined by the Section or Branch Chief.

7.2.2 All appropriate levels of review are included in the RP and any levels not included require documentation in the RP of the risk-informed decision not to undertake that level of review per “02710-SAJ EN Preparation and Submittal of Civil Works Review Plans”.

7.2.3 EN will execute the levels of review on the specific work product based on the project phase and/or design submittal milestone identified in the RP.

- Review applicability and frequency will vary based on the project phase and/or design submittal milestone for the specific work product.
- Some examples of variable levels of review include:
  - ✓ A BCOES Review does not apply during the feasibility phase.
  - ✓ DQC applies to all work products regardless of project phase.
  - ✓ ATR can occur multiple times during a project phase to support design submittal milestones (i.e. Intermediate Design Submittal and Final Design Submittal).

7.2.4 For DQC (i.e. DQCR and PQCR):

- The DQCR Team:
  - ✓ May include staff responsible for the work, such as supervisors, work leads, or other qualified personnel.
  - ✓ May not include the same people that prepared the work product.
  - ✓ Documents the review on applicable discipline checklists.

- ✓ Certifies DQCR using the Attachment A DQCR Certification.
- The PQCR Team:
  - ✓ Includes the EN PDT members, Section, and Branch Chiefs.
  - ✓ Documents the review on applicable discipline checklists and in DrChecks.
  - ✓ Certifies PQCR using the Attachment B PQCR Certification and Attachment C PQCR Package Checklist.

#### 7.2.5 For ATR, the ATR Team:

- Includes a qualified team from outside SAJ comprised of senior USACE personnel, preferably recognized subject matter experts with the appropriate technical expertise such as regional technical specialists (RTS) or representatives from Communities of Practice (CoPs), PCXs, and other relevant offices.
  - ✓ Should include members from the Corps of Engineers Review Certification and Access Program (CERCAP), if available.
  - ✓ Must include appropriate independence and expertise.
- May be supplemented by outside experts.
- May not include people involved in the day-to-day production of the project or product.
- Should be established shortly after the PDT and mirror the PDT disciplines.
- Should be engaged by the PDT at appropriate milestones.
- Must be reviewed and concurred to by the RMO prior to implementation.
- Documents the review in DrChecks.
- Provides a written report of the ATR Team actions and specific concerns to the PDT through the RMO.
- Certifies ATR using a document consistent with the Attachment D ATR Certification.

#### 7.2.6 For a Customer Review, the Customer Review Team:

- Should be at the discretion of the Project Sponsor.
- Documents the review in DrChecks.

#### 7.2.7 For a BCOES Review, the BCOES Review Team:

- Should include members from appropriate Divisions such as Construction Division (CD) and Planning Division (PD).

- Documents the review in DrChecks.
- Certifies BCOES Review using the Attachment E BCOES Review Certification and Attachment F BCOES Review Package Checklist.

7.2.8 For IEPR, the IEPR Team:

- Includes a qualified team of independent, recognized experts from outside USACE in appropriate disciplines, to represent a balance of areas of expertise suitable for the review being conducted.
- Must adhere to the NAS Policy on Committee Composition and Balance and Conflicts of Interest, which sets the standard for “independence” in review process and complexity in a national context, to eliminate potential conflict of interest situations such as:
  - ✓ Financial interests.
  - ✓ Access to confidential information.
  - ✓ Reviewing one’s own work.
  - ✓ Public statements and positions.
  - ✓ Employees of Sponsors.
- May be approved by the RMO or other USACE officials.
- Provides a written report of the IEPR Team actions and specific concerns to the PDT.

7.2.9 For a Policy and Legal Compliance Review, the Policy and Legal Compliance Review Team is led by PD in accordance with “ER 1105-2-100, Planning Guidance Notebook” and supported by EN as needed.

### **7.3 Setting Up the Project (Plan Step).**

7.3.1 The Branch Chiefs will appoint an ETL to a project in accordance with “02510-SAJ EN Engineering Technical Lead Appointment: Roles and Responsibilities”.

7.3.2 The Branch Chiefs will appoint PDT, DQCR, and PQCR Team members based on recommendations provided by the Section Chiefs.

- Other Corps Resources will be included as part of the PDT when tasked by SAJ to complete one or more tasks (i.e. Geotechnical, Mechanical, etc) to jointly prepare products with SAJ EN resources.
- The ETL will lead the PDT to develop the technical portion of the SOW for the work product to be produced by the Other Corps Resource and provide the SOW to EN-TA to coordinate the contract.
- The ETL will ensure the SOW content includes:
  - ✓ Design work to be completed.

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- ✓ Submittals and submittal milestones.
  - ✓ Review responsibilities including participating in reviews, responding to review comments, etc.
- If an Other Corps Resource is assigned to prepare whole products, then the work must be executed in accordance with “02612-SAJ EN Quality Assurance of Outside Resource Products: Civil Works”.

7.3.3 The ETL will prepare the EN portion of the RP in accordance with “02710-SAJ EN Preparation and Submittal of Civil Works Review Plans” to outline the work products and the appropriate levels of review during work product design and development.

7.3.4 The ETL will prepare the EN portion of the QCP in accordance with “02711-SAJ EN Preparation and Submittal of Civil Works Quality Control Plans and Quality Assurance Plans” to define how QC will be executed on work products.

7.3.5 The ETL will prepare a schedule in accordance with “02820-SAJ EN Schedule Development and Monitoring” to document the timing of reviews and execute the applicable reviews in accordance with Paragraphs 7.5 through 7.9.

- The schedule must provide sufficient time for all reviews to occur at the appropriate points in the project.
- Reviews must be scheduled and conducted as early as possible to minimize delays in the project.
- Reviewers must provide comments during the appropriate comment period to reduce unnecessary redesign and rework.

#### **7.4 Completing Designs or Technical Reviews (Do Step).**

7.4.1 The PDT will complete design or technical review of the work product in accordance with the PMP.

- The following QMS processes should be referenced for the applicable work product:

<b>Product</b>	<b>Process Number</b>	<b>Process Title</b>
Plans and Specifications	02630-SAJ EN	Work Flow and Submittal Requirements for Plans and Specifications
33 USC Section 408 Modifications	02650-SAJ EN	Modification of Federally Authorized Projects 33 USC Section 408 Modifications
Amendments to Construction Solicitations	08600-SAJ EN	Amendments During Solicitation
Engineering Considerations and Information for Field Personnel	08610-SAJ EN	Engineering During Construction (EDC)

<b>Product</b>	<b>Process Number</b>	<b>Process Title</b>
Requests For Information and Construction Submittals	08620-SAJ EN	Requests for Information and Construction Submittals
Requests for Equitable Adjustments and Contractor Claims	08630-SAJ EN	Evaluation of Requests for Equitable Adjustment and Contractor Claims
Construction Contract Modifications	08640-SAJ EN	Construction Contract Modifications

## **7.5 Conducting District Quality Control Reviews (Do Step).**

7.5.1 Each discipline specific EN PDT member will manage DQCR of individual work product elements to support DQC per the RP.

7.5.2 Each EN PDT member will provide the individual work product element to the DQCR Team documented in the QCP for review.

7.5.3 The DQCR Team will evaluate at least the following items and document the review on applicable checklists in accordance with “08500-SAJ EN Engineering Checklists”:

- Design criteria is established, approved, and documented.
- Correct application of methods.
- Compliance with guidance, standards, regulations, and laws.
- Adequacy of basic data and assumptions.
- Correctness, accuracy, and clarity of drawing presentation.
- Correctness of calculations including appropriate red dot checks.
- Quantity estimates.
- Completeness of documentation.
- Validation that testing, modeling, assumptions, calculations, text, and graphic presentations in all documents are complete, satisfy appropriate design criteria, and use sound engineering practice.
- Outputs from customized (improvised) software or spreadsheets are valid and critical load cases are hand checked.
- BCOES considerations.

7.5.4 Each EN PDT member will provide responses and complete actions resulting from DQCR until a final individual work product element is produced.

7.5.5 Each EN PDT member will initiate and route the Attachment A DQCR Certification.

- The typical time period for routing the certification is 2 to 3 business days.
- The Section and Branch Chief will certify that DQCR has been completed prior to release of the individual work product element from the Section or Branch.
- Checklists completed by the DQCR Team will be attached to the signed certification.

7.5.6 Each EN PDT member will provide the final individual work product element and signed Attachment A DQCR Certification to the ETL.

7.5.7 The ETL will collect, review, and compile the certified individual work product elements into the overall EN work product review package.

7.5.8 The ETL will manage PQCR of the review package to support DQC per the RP.

7.5.9 The ETL will provide the review package and the PQCR Team points of contact to EN-DC.

7.5.10 EN-DC will setup the PQCR in DrChecks in accordance with “02720-SAJ EN SAJ Utilization of ProjNet - DrChecks”.

7.5.11 The PQCR Team will document the review on applicable checklists in accordance with “08500-SAJ EN Engineering Checklists” and in DrChecks in accordance with “02720-SAJ EN SAJ Utilization of ProjNet - DrChecks”.

7.5.12 The ETL will coordinate the PDT to provide responses and complete actions resulting from PQCR until a corrected EN work product is produced.

7.5.13 The ETL will initiate and route the Attachment B PQCR Certification and the Attachment C PQCR Package Checklist.

- The typical time period for routing the certification is 5 business days.
- The Branch and Division Chiefs will certify that PQCR has been completed prior to release of the work product from EN.
- Checklists completed by the DQCR and PQCR Team will be attached to the signed certification.

- DQCR Certifications completed by the applicable Branches will be attached to the signed certification.
- The ETL will assign a lead to all PQCR comments using the DrChecks “Snapshot By Discipline” and “All Comments” reports and attach the reports to the signed certification.
  - ✓ The submitted DrChecks reports must be organized in a manner clearly identifying that the comment is assigned a lead and that the comment has been checked by a Section Chief as detailed below.
- A Section Chief reviewed printout of the DrChecks “All Comments” report from PQCR will be attached to the signed certification that includes the Section Chief initials next to each comment indicating that the comment was reviewed for significance and has been adequately closed.
  - ✓ Comments determined by the Section Chief to be significant will be annotated with an “(S)” to the left of the comment “Id”.
  - ✓ Significant comments include technical comments that must be incorporated for the work product to meet technical requirements (i.e. incorrect calculations, design errors, etc).
  - ✓ Significant comments do not include personal preferences over otherwise acceptable practices (i.e. alternate solutions or analysis methods when the designers have already used appropriate methods to develop an adequate solution).

7.5.14 The ETL will submit the corrected EN work product for the next level of review or release in accordance with the RP and schedule.

- All comments from DQC should be adequately evaluated, closed, or incorporated prior to ATR or IEPR.

## **7.6 Conducting Agency Technical Reviews (Do Step).**

7.6.1 The ETL will manage the ATR of the EN review package per the RP.

7.6.2 The ETL will notify the Review Manager at least two months prior to the ATR start date to ensure sufficient time is available for assembling the ATR Team.

7.6.3 The Review Manager will:

- Assemble the ATR Team and obtain concurrence of the team members from the RMO.
- Coordinate directly with the ATR Team Leader to schedule the ATR.
- Remind the ETL to provide DQC Certification documentation to the ATR Team Leader to support the ATR Team assessing DQC adequacy.

7.6.4 The ETL will coordinate directly with the ATR Team Leader to accomplish the ATR, which may include a site visit based on the complexity of the project.

7.6.5 The ETL will provide the EN review package and the ATR Team points of contact to EN-DC.

7.6.6 EN-DC will setup the ATR in DrChecks in accordance with “02720-SAJ EN SAJ Utilization of ProjNet - DrChecks”.

7.6.7 The ATR Team will conduct the ATR in accordance with “EC 1165-2-214 Civil Works Review” based on the charge provided by the RMO and document the review in DrChecks.

7.6.8 The ATR Team will provide a written report of its actions and specific concerns to the PDT through the RMO.

7.6.9 The ETL will coordinate the EN PDT to develop responses to the specific concerns and coordinate those responses with the ATR Team through the RMO.

7.6.10 The ETL will coordinate the EN PDT to complete actions resulting from ATR until a corrected EN work product is produced.

7.6.11 The ATR Team Leader will initiate and route a document consistent with the Attachment D ATR Certification.

- The EN Division Chief will certify that ATR has been completed and all concerns resulting from the ATR have been fully resolved.
  - Unresolved comments involving disagreement between the ATR Team and the PDT will be documented in a report from the ATR Team Leader and attached to the signed certification.
  - The ETL will assign a lead to all ATR comments using the DrChecks “Snapshot By Discipline” and “All Comments” reports and attach the reports to the signed certification.
    - ✓ The submitted DrChecks reports must be organized in a manner clearly identifying that the comment is assigned a lead and that the comment has been checked by a Section Chief as detailed below.
  - A Section Chief reviewed printout of the DrChecks “All Comments” report from ATR will be attached to the signed certification that includes the Section Chief initials next to each comment indicating that the comment was reviewed for significance and has been adequately closed.
    - ✓ Comments determined by the Section Chief to be significant will be annotated in accordance with Paragraph 7.5.13.
- 7.6.12 The ETL will submit the corrected EN work product for the next level of review or release in accordance with the RP and schedule.
- All comments from ATR should be adequately evaluated, closed, or incorporated prior to beginning a BCOES Review of the Final Design Submittal.

## **7.7 Conducting Customer Reviews (Do Step).**

7.7.1 The ETL will manage Customer Reviews of the EN work product as requested by the Project Sponsor.

7.7.2 The ETL will coordinate with the Customer Review point of contact and provide copies of the review package.

- Copies of plans and specifications (P&S) will be provided in accordance with the Attachment G memorandum.

7.7.3 The ETL will provide the EN review package and the Customer Review points of contact to EN-DC.

7.7.4 EN-DC will setup the Customer Review in DrChecks in accordance with “02720-SAJ EN SAJ Utilization of ProjNet - DrChecks”.

7.7.5 The Project Sponsor will conduct the Customer Review based on internal practices and document the review in DrChecks.

7.7.6 The ETL will coordinate the EN PDT to provide responses and complete actions resulting from the Customer Review process until a corrected EN work product is produced.

- The ETL will assign a lead to all Customer Review comments using the DrChecks “Snapshot By Discipline” and “All Comments” reports.

✓ The DrChecks reports must be organized in a manner clearly identifying that the comment is assigned a lead and that the comment has been checked by a Section Chief as detailed below.

- A Section Chief reviewed printout of the DrChecks “All Comments” report from the Customer Review will be reviewed by the PDT that includes the Section Chief initials next to each comment indicating that the comment has been adequately closed.

7.7.7 The ETL will submit the corrected EN work product for the next level of review or release in accordance with the RP and schedule.

- All comments from the Customer Review should be adequately evaluated, closed, or incorporated prior to beginning a BCOES Review of the Final Design Submittal.

## **7.8 Conducting Biddability, Constructability, Operability, Environmental, and Sustainability Reviews (Do Step).**

7.8.1 The ETL will manage BCOES Reviews of the review package per the RP.

- BCOES Reviews of the Intermediate Design Submittal are referred to as the Initial BCOES Review and typically occur concurrently with ATR and Customer Review.
- BCOES Reviews of the Final Design Submittal should occur only after all other reviews are complete and the P&S have been revised.
  - ✓ Any modifications due to design related issues identified during BCOES Reviews can have significant impacts on the P&S resulting in last minute revisions and schedule delays.
  - ✓ Ideally, no changes occur to the P&S after posting for BCOES Review unless the changes are the result of a BCOES Review comment or an amendment during solicitation.
  - ✓ Changes to the P&S after a BCOES Review has begun affect the integrity of the review process in that the BCOES Review Team may not have the opportunity to review portions of the solicitation prior to advertisement.
- The review package for the Final BCOES Backcheck Review prior to being RTA must include:
  - ✓ Final Design Submittal P&S.
  - ✓ Contract clauses.
  - ✓ Forms.
  - ✓ Bid schedule.
  - ✓ Other documents that comprise the total solicitation package and planned contract.

7.8.2 The ETL will provide the review package and the BCOES Review Team points of contact to EN-DC.

7.8.3 EN-DC will setup the BCOES Review in DrChecks in accordance with “02720-SAJ EN SAJ Utilization of ProjNet - DrChecks”.

- The standard schedule for performing the BCOES Review activities is as follows and should only be shorted with documented CD concurrence:
  - ✓ Comment submission period – 15 business days.
  - ✓ Comment evaluation period – 5 business days.
  - ✓ Comment backcheck period – 5 business days.
  - ✓ Comment incorporation period – 15 business days.

7.8.4 The BCOES Review Team will conduct the review in accordance with “ER 415-1-11, Biddability, Constructability, Operability, Environmental and Sustainability (BCOES) Reviews” and document the review in DrChecks.

7.8.5 The ETL will coordinate the EN PDT to provide responses and complete actions resulting from the BCOES Review process until a corrected EN work product is produced.

7.8.6 If the BCOES Review was performed on an Intermediate Design Submittal (i.e. Initial BCOES Review), then the ETL will submit the corrected EN work product for the next level of review in accordance with the RP and schedule.

7.8.7 If the BCOES Review was performed on a Final Design Submittal, then EN-DC, with ETL support, will:

- Ensure all comments have been adequately evaluated, closed, or incorporated.
  - ✓ Unresolved BCOES Review comments that cannot be agreed upon by the BCOES Review Team will be elevated promptly to the appropriate Section, Branch, or Division Chief for resolution.
  
- Initiate and route separate Attachment E BCOES Review Certifications to all Divisions participating on the BCOES Review Team.
  - ✓ The typical timeframe for routing the certifications is 10 business days.
  - ✓ The participating Division Chiefs will certify that the BCOES Review has been completed and all concerns resulting from the BCOES Review have been fully resolved.
  - ✓ The Project Manager and Value Engineering (VE) Officer will certify that all statutory and regulatory requirements for VE in the project have been completed and results incorporated.
  - ✓ The Corrected Final - RTA Submittal will be attached to the signed certification.
  - ✓ All applicable review certifications and supporting documentation, including checklists, DrChecks comment printouts, etc, will be attached to the signed certification.
  - ✓ The ETL will assign a lead to all BCOES Review comments using the DrChecks “Snapshot By Discipline” and “All Comments” reports and attach the reports to the signed certification.
    - The submitted DrChecks reports must be organized in a manner clearly identifying that the comment is assigned a lead and that the comment has been checked by a Section Chief as detailed below.
  - ✓ A Section Chief reviewed printout of the DrChecks “All Comments” report from the BCOES Review will be attached to the signed certification that includes the Section Chief initials next to each comment indicating that the comment was reviewed for significance and has been adequately closed.
    - Comments determined by the Section Chief to be significant will be annotated in accordance with Paragraph 7.5.13.
  
- Compile the Corrected Final - RTA Submittal and BCOES Certification Package, including the Attachment F BCOES Review Package Checklist, and transmit to CT for release.

## **7.9 Conducting Independent External Peer Reviews (Do Step).**

7.9.1 The ETL will manage IEPR of the EN work product per the RP.

7.9.2 The ETL will notify the Review Manager and EN-TA at least two months prior to the anticipated IEPR start date and provide a SOW for the A-E task order with an IEPR Team that satisfies the requirements of Paragraph 7.2.8.

7.9.3 The Review Manager will:

- Coordinate with the RMO to provide notification of IEPR.

- Support developing and negotiating the A-E task order.

7.9.4 EN-TA will:

- Support developing and negotiating the A-E task order.
- Issue the A-E task order.

7.9.5 The ETL will coordinate directly with the IEPR Team Leader to accomplish the IEPR, which may include a site visit based on the complexity of the project.

7.9.6 The IEPR Team will conduct the review in accordance with the task order and “EC 1165-2-214 Civil Works Review” based on the charge provided by the RMO.

7.9.7 The IEPR Team will prepare and submit a final report to SAJ documenting the results.

7.9.8 The ETL will coordinate the EN PDT to provide responses and complete actions resulting from IEPR until a corrected EN work product is produced.

7.9.9 The ETL will prepare a SAJ memorandum requesting MSC/SAD Chief of Business Technical Division approval of the SAJ written response to all comments and provide the documents to the EN, CD, and Operations Division (OD) Division Chiefs for review.

- The SAJ memorandum must address all issues identified in the IEPR report including:
  - ✓ Any actions undertaken or to be undertaken in response to the report.
  - ✓ Reasons the actions satisfy the key concerns stated in the report.

7.9.10 The ETL will work with the EN PDT to resolve any comments from the review of the SAJ memorandum and provide the final document for EN Division Chief signature.

7.9.11 The EN Division Chief will endorse the memorandum.

7.9.12 The Review Manager will forward the signed SAJ memorandum and IEPR report to the MSC/SAD Chief of Business Technical Division for approval.

7.9.13 The MSC/SAD Chief of Business Technical Division will approve the SAJ memorandum via a memorandum responding to the SAJ memorandum, which documents the MSC/SAD acceptance and agreement with the SAJ response.

- If there is disagreement over the scope, content, or other aspects of the SAJ memorandum, the MSC/SAD Chief of Business Technical Division will coordinate resolution between SAJ and the RMO with support from the Review Manager and ETL.

7.9.14 The Review Manager will redact the SAJ and MSC/SAD Chief of Business Technical Division memorandums and oversee the documents being posted to the public SAJ internet website within 10 business days of MSC/SAD Chief of Business Technical Division approval to

allow the opportunity for public comment.

7.9.15 The ETL will submit the corrected EN work product for the next level of review or release in accordance with the RP and schedule.

**7.10 Conducting After Action Reviews (Check Step).**

7.10.1 The ETL will conduct After Action Reviews (AARs) in accordance with “33500-SAJ EN SAJ Engineering After Action Reviews and Lessons Learned”.

7.10.2 The Quality Manager will perform process and procedure measurements as outlined in the individual QMS processes.

7.10.3 The Quality Manager will issue a bi-annual metric report documenting the results of the independent audits and reviews.

**7.11 Implementing Continual Improvement (Act Step).**

7.11.1 EN will identify and implement process changes for continual improvement based on the items identified in Paragraph 7.10.

**8.0 Records and Measurements.**

All EN PDT records will be filed in accordance with “00600-SAJ EN ProjectWise Document & Record Management”.

Type	Description	Responsible Office	Location	Record Media	Retention	Disposition
R	Approved Attachment A DQCR Certification including completed checklists, red dot drawings, etc.	SAJ EN; ETL	ProjectWise Project Folder and Current Files Area (CFA)	E/P	LR; Retain in accordance with “00600-SAJ EN ProjectWise Document & Record Management”.	LR; Disposition in accordance with “00600-SAJ EN ProjectWise Document & Record Management”.
R	Approved Attachment B PQCR Certification and Attachment C PQCR Package Checklist including completed checklists, DrChecks comments signed by Section Chief, etc.	SAJ EN; ETL	ProjectWise Project Folder and CFA	E/P	LR; Retain in accordance with “00600-SAJ EN ProjectWise Document & Record Management”.	LR; Disposition in accordance with “00600-SAJ EN ProjectWise Document & Record Management”.

Type	Description	Responsible Office	Location	Record Media	Retention	Disposition
R	Approved Attachment D ATR Certification including ATR report, DrChecks comments signed by Section Chief, etc.	SAJ EN; ETL	ProjectWise Project Folder and CFA	E/P	LR; Retain in accordance with "00600-SAJ EN ProjectWise Document & Record Management".	LR; Disposition in accordance with "00600-SAJ EN ProjectWise Document & Record Management".
R	Approved Attachment E BCOES Certification and Attachment F BCOES Review Package Checklist including DrChecks comments signed by Section Chief, etc.	SAJ EN; ETL	ProjectWise Project Folder and CFA	E/P	LR; Retain in accordance with "00600-SAJ EN ProjectWise Document & Record Management".	LR; Disposition in accordance with "00600-SAJ EN ProjectWise Document & Record Management".
R	Corrected Final - Ready to Advertise Submittal P&S.	SAJ EN; ETL	ProjectWise Project Folder	E	LR; Retain in accordance with "00600-SAJ EN ProjectWise Document & Record Management".	LR; Disposition in accordance with "00600-SAJ EN ProjectWise Document & Record Management".
R	SAJ Memorandum requesting approval of IEPR report response including associated IEPR report.	SAJ EN; ETL	ProjectWise Project Folder	E	LR; Retain in accordance with "00600-SAJ EN ProjectWise Document & Record Management".	LR; Disposition in accordance with "00600-SAJ EN ProjectWise Document & Record Management".
R	MSC/SAD Memorandum providing IEPR report response approval.	SAJ EN; ETL	ProjectWise Project Folder	E	LR; Retain in accordance with "00600-SAJ EN ProjectWise Document & Record Management".	LR; Disposition in accordance with "00600-SAJ EN ProjectWise Document & Record Management".
R	IEPR report and SAJ response including associated SAJ and MSC/SAD Memorandums.	SAJ EN; Review Manager	<a href="http://www.saj.usace.army.mil/Missions/Civil-Works/Review-Plans/">http://www.saj.usace.army.mil/Missions/Civil-Works/Review-Plans/</a>	E	EC 1165-2-214	EC 1165-2-214
R	Bi-Annual EN Metric Report	SAJ EN; Quality Manager	SAJ EN QMS	E	LR; Maintain reports over last two years (i.e. 4 total).	LR; Remove from published view when no longer within retention window.

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Type	Description	Responsible Office	Location	Record Media	Retention	Disposition
M	Approved IEPR report response including associated SAJ and MSC/SAD Memorandums are posted to the public SAJ internet website within 10 business days per Paragraph 7.9.14.	SAJ EN-Q	SAJ EN-Q	N/A	N/A	N/A

**Description of Terms**

Type:

- R Record
- M Measurement
- LR Local Requirements (Office/Location/Retention/Disposition)

Record Media

- E Electronic
- P Paper

**9.0 Attachments.**

Attachment A - Disciple Quality Check and Review Certification

Attachment B - Product Quality Control Review Certification

Attachment C - Product Quality Control Review Package Checklist

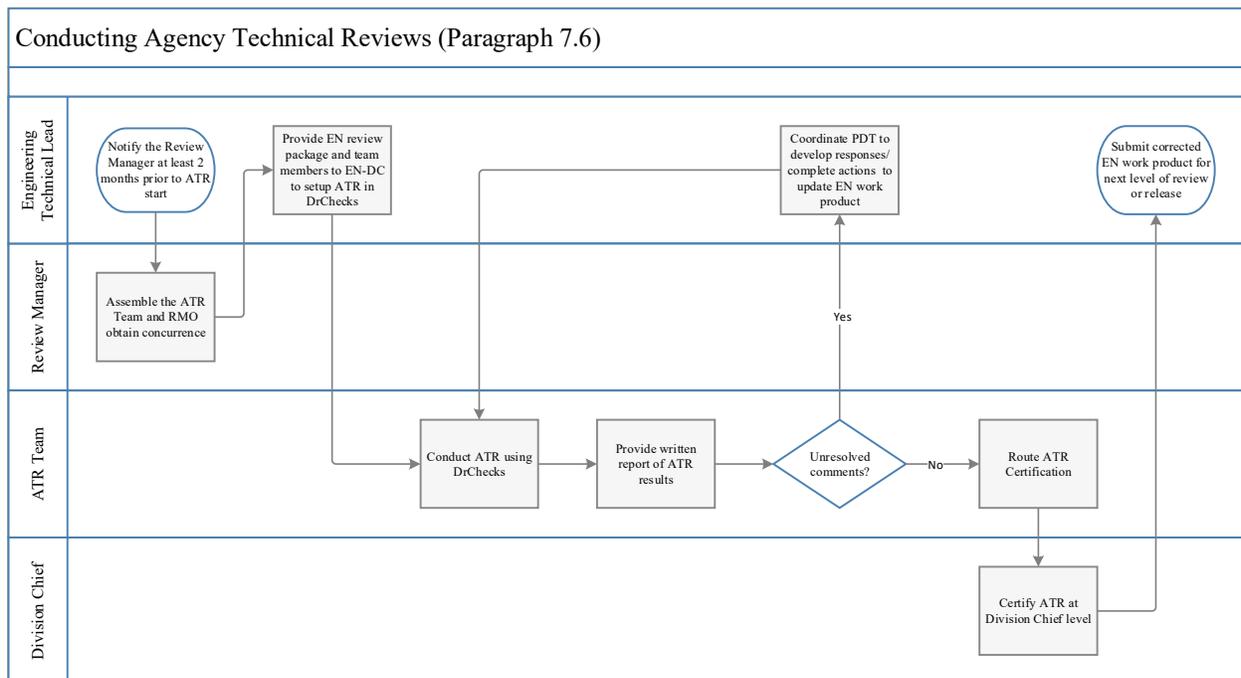
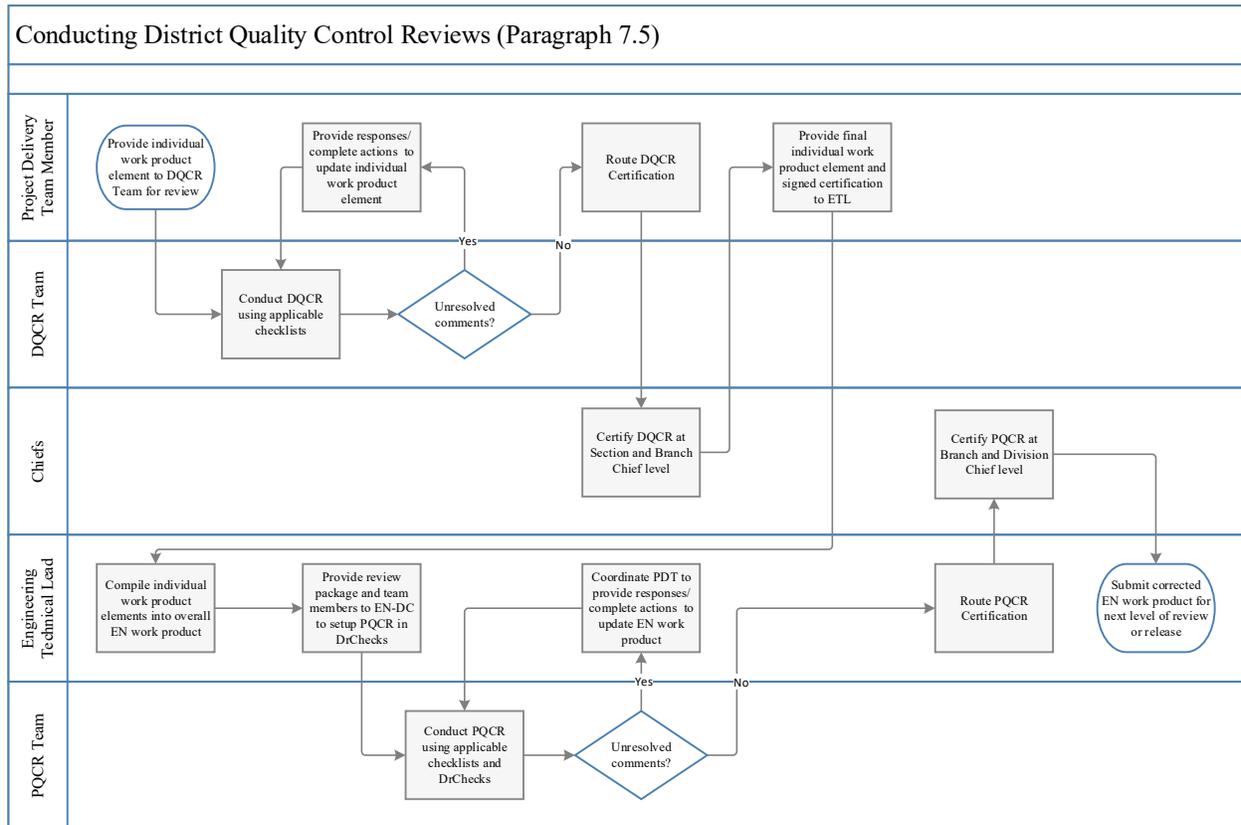
Attachment D - Agency Technical Review Certification

Attachment E - Biddability, Constructability, Operability, Environmental, and Sustainability Review Certification

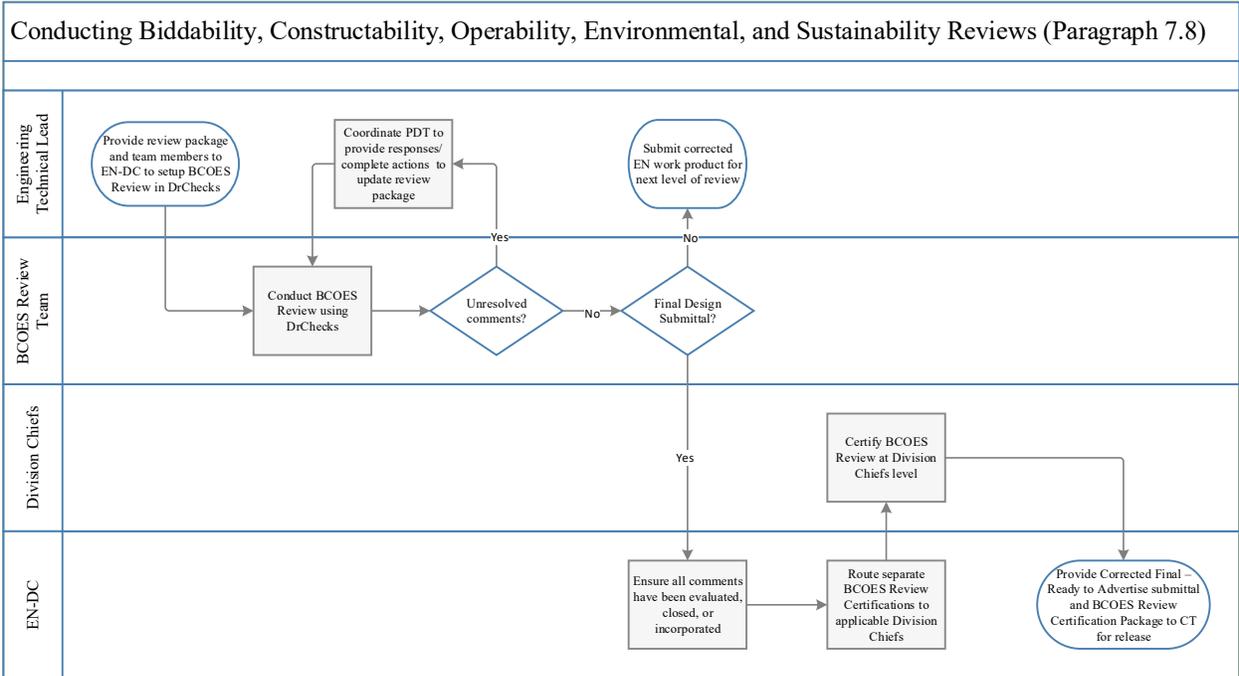
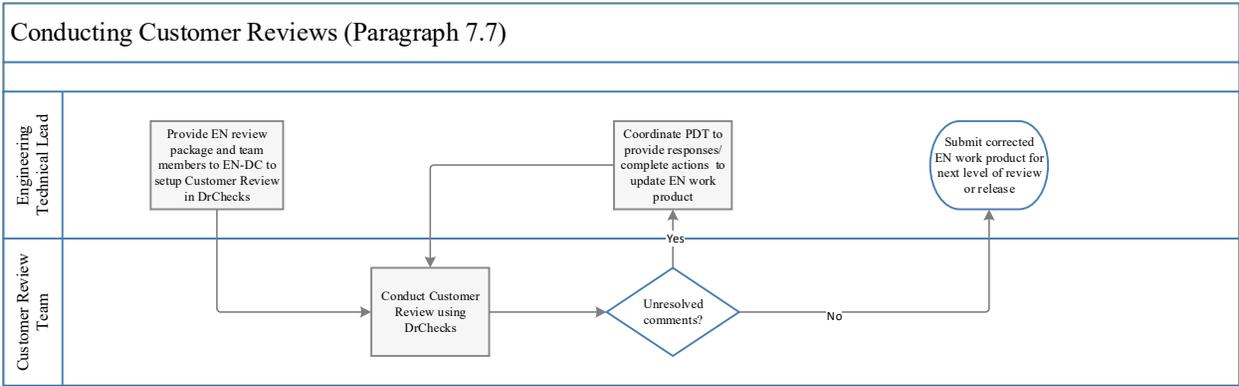
Attachment F - Biddability, Constructability, Operability, Environmental, and Sustainability Review Package Checklist

Attachment G - CESAJ-CT (715ee) Memorandum dated 28 August 2007

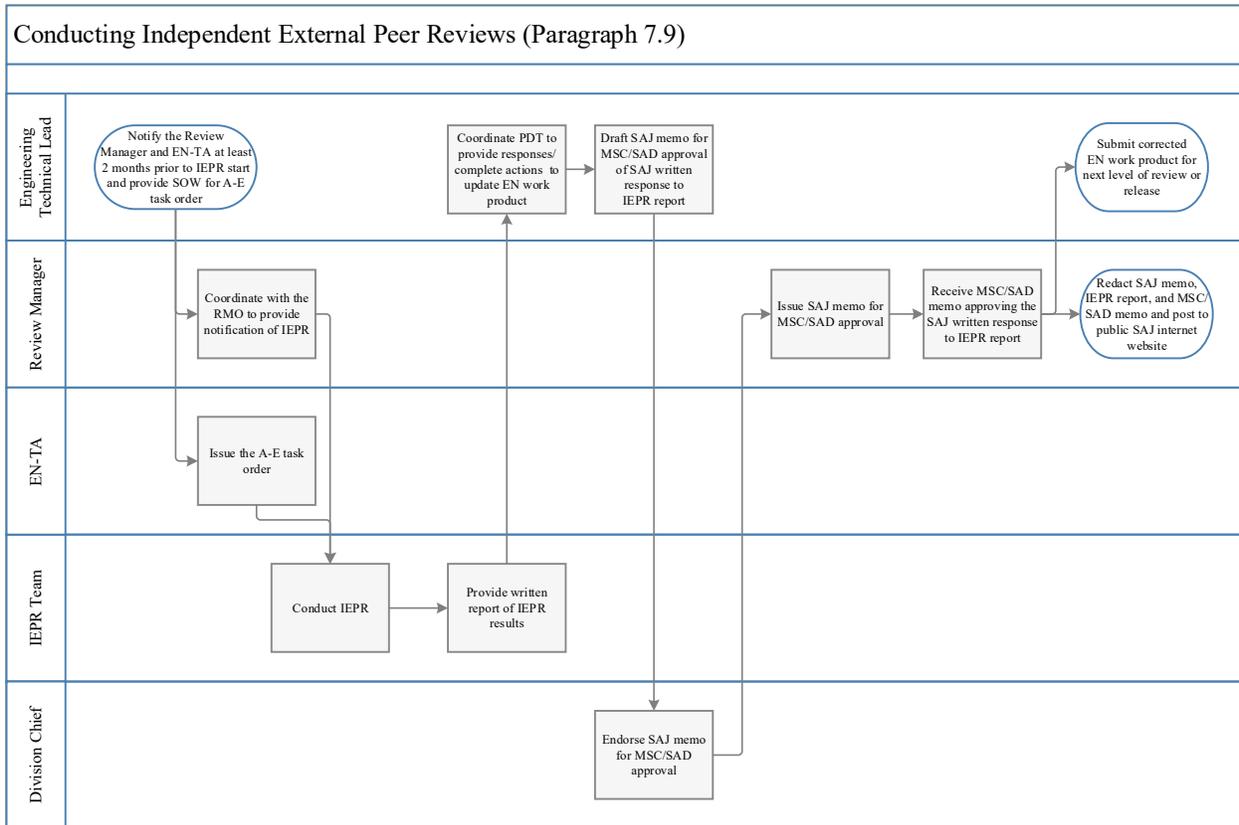
## 10.0 Flow Chart.



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### Document Version History

NO.	DATE	DESCRIPTION	NOTES
0	11/21/2011	Initial issue.	
1	12/4/2017	Throughout: Updated to reflect current business practices and expanded applicability to all project phases. Paragraph 6.0: Assigned EN-D as the Process Champion. Incorporates actions resulting from the 3/2017 RMC audit of SAD Dam Safety Production Center. Absorbs prior procedures “02614-SAJ EN Quality Control of In-House Products: Civil Works Feasibility” and “08550-SAJ BCOE Reviews” and creates new procedure “02711-SAJ EN Preparation and Submittal of Civil Works Quality Control Plans and Quality Assurance Plans”.	

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