



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

30 NOV 2015

CESAD-RBT

MEMORANDUM FOR COMMANDER, WILMINGTON DISTRICT

SUBJECT: Approval of the Review Plan for the Island Creek Interim Risk Reduction Measures Plan

1. References:

a. Memorandum, CESAW-ECP-E, 23 September 2015, subject: Approval of the Review Plan for the Island Creek Interim Risk Reduction Measures Plan (Encl).

b. EC 1165-2-214, Civil Works Review, 15 December 2012.

2. The enclosed Review Plan (RP) for the Island Creek Interim Risk Reduction Measures Plan (IRRMP) has been reviewed by this office. Based on additional coordination with the Risk Management Center (RMC), they have agreed that there is no significant threat to human life based on this IRRMP effort. Therefore, subsequent to submittal of the RP for approval, the RP has been edited to change the Review Management Organization from the RMC to the South Atlantic Division (SAD). These edits were coordinated with and agreed to by your staff. The enclosed RP, with the coordinated edits incorporated, is hereby approved in accordance with reference 1.b above.

3. SAD concurs with the conclusion of the District Chief of Engineering that a Type II IEPR is not required on this conceptual level plan. The primary basis for the concurrence that a Type II IEPR is not required is the determination that failure or loss of this IRRMP would not pose a significant threat to human life.

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

5. The SAD point of contact is [REDACTED] CESAD-RBT, [REDACTED]

Encl

C. DAVID TURNER
Brigadier General, USA
Commanding

CF:

CESAW-ECP-E/[REDACTED]
CESAW-ECP-E/[REDACTED]



DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

CESAW-ECP-E

23 September 2015

MEMORANDUM FOR Commander, US Army Corps of Engineers, South Atlantic Division (CESAD-RBT), ATTN: [REDACTED] CESAD-RBT, Rm 10M15, 60 Forsyth Street, SW, Atlanta, Georgia 30303-8801

SUBJECT: Approval of Review Plan for Island Creek Dam Interim Risk Reduction Measures Plan

1. Reference

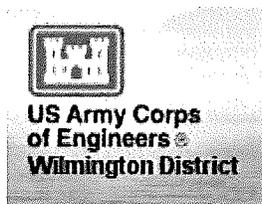
EC 1165-2-214, Civil Works Review Policy, 15 Dec 2012

2. I hereby request approval of the enclosed Review Plan for the Island Creek Dam Interim Risk Reduction Measures Plan. The Review Plan complies with applicable policy and includes District Quality Control and Agency Technical Review plans for this project. Additionally, the SAW Dam Safety Officer endorses the Review Plan as submitted.

3. The District will post the Corps of Engineers, South Atlantic Division (CESAD) approved Review Plan to its website and provide a link to the CESAD for its use. Names of Corps/Army employees are withheld from the posted version in accordance with guidance.

Encl


KEVIN P. LANDERS SR.
COL, EN
Commanding



Review Plan

For

Island Creek Dam Interim Risk Reduction Measures Plan (IRRMP) Update

**Mecklenberg County, Virginia
P2 #: 111649**

**U.S. Army Corps of Engineers
Wilmington District
Wilmington, North Carolina**

**Revision Date: 10 September 2015
MSC Approval Date:**

THE INFORMATION CONTAINED IN THIS REVIEW PLAN IS DISTRIBUTED SOLELY FOR THE PURPOSE OF PREDISSEMINATION REVIEW UNDER APPLICABLE INFORMATION QUALITY GUIDELINES. IT HAS NOT BEEN FORMALLY DISSEMINATED BY THE U.S. ARMY CORPS OF ENGINEERS, WILMINGTON DISTRICT. IT DOES NOT REPRESENT AND SHOULD NOT BE CONSTRUED TO REPRESENT ANY AGENCY DETERMINATION OR POLICY.

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1. PURPOSE AND REQUIREMENTS

1.1 Purpose

This Review Plan defines the scope and level of review activities for the Island Creek Dam Interim Risk Reduction Measures Plan (IRRMP) Update. The IRRMP Update will incorporate new formatting requirements per regulation as well as recommendations for seepage control measures. The IRRMP, per EC 1165-2-214 is an “other work product.” The review activities for the IRRMP update will consist of District Quality Control (DQC) and Agency Technical Review (ATR). Upon approval, this review plan will be included into the Project Management Plan.

1.2 References

- ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 August 1999
- ER 1110-1-12, Engineering and Design Quality Management, 31 March 2011
- EC 1165-2-214, Civil Works Review, 15 Dec. 2012
- ER-1110-2-1156, Safety of Dams – Policy & Procedures, 31 March 2014
- EC-1165-2-216, Policy and Procedural Guidance for Processing Requests to Alter U.S. Army Corps of Engineers Civil Works Projects Pursuant to 33 USC 408, 31 July 2014
- Quality Control Plan
- Project Management Plan
- 2008 Screening Portfolio Risk Analysis for Island Creek Dam
- Island Creek Periodic Inspection Report No.9 & Periodic Assessment No. 1, April 2013

1.3 Requirements

This review plan was developed in accordance with EC 1165-2-214, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and Operation, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R). The EC provides the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision, implementation, and operations and maintenance documents and other work products. The EC outlines three levels of review for “other work products”: District Quality Control, Agency Technical Review, and Independent External Peer Review. Refer to the EC for the definitions and procedures for these three levels of review.

1.4 Review Management Organization (RMO).

With agreement from the USACE Risk Management Center (RMC), the South Atlantic Division will be the Review Management Organization (RMO) for this project. Contents of this review plan have been coordinated with the RMC and the South Atlantic Division (SAD), the Major Subordinate Command (MSC). In-Progress Review (IPR) team meetings with the RMC, SAD, and Headquarters (HQ) will be scheduled on an “as needed” basis to discuss programmatic,

policy, and technical matters. The SAD Dam/Levee Safety Program Manager will be the POC for vertical team coordination. This review plan will be updated for each new project phase. Wilmington District will assist the SAD with management of the Agency Technical Review (ATR) and development of the draft ATR “charges”.

2. PROJECT INFORMATION AND BACKGROUND

2.1 Project Description

Island Creek Dam is an auxiliary earth dam and pumping station on Island Creek and is a component of the John H. Kerr Dam and Reservoir. The John H. Kerr Dam is located in Mecklenburg County, Virginia, on the Roanoke River. The project extends into portions of Mecklenburg, Charlotte, and Halifax Counties in Virginia and Warren, Vance, and Granville Counties in North Carolina. The reservoir stretches approximately 39 miles upstream of the dam on the Roanoke River and 19 miles upstream on the Dan River from its confluence with the Roanoke. Kerr Dam is a concrete gravity dam 2,785 feet long with a maximum height of 144 feet. The reservoir is operated as a unit of a coordinated reservoir system for flood damage reduction in the Roanoke River basin and provides generation of hydroelectric power.

Island Creek Dam was constructed to prevent inundation of the Tungsten Queen mine which was a critical material needed for National Defense at the time of the development of the John H. Kerr Dam and Reservoir. The pump station at Island Creek moves surface water runoff from the Island Creek drainage basin into John H. Kerr Reservoir. The station contains three pumps, each rated at 1750 HP, 89000 gallons per minute at 48.5 total dynamic head. Dam and pump station construction was completed in September 1955.

In 2008, a Screening Portfolio Risk Analysis (SPRA) was performed for the Island Creek Dam resulting in a DSAC III rating. At that time, the DSAC III rating was described as “High Priority” (conditionally unsafe). The driver for this rating was concern for the stability of the embankment under Normal, Unusual, and Extreme loading events, as well as the loss of the Kerr Lake pool due to the shutdown of the pumps at the pumping station due to high water or loss of power.

The initial IRRMP was completed in 2009 with subsequent updates in 2011 and 2013. This document proposes measures that can be implemented to reduce the risk of potential failure of Island Creek Dam.

In 2013, a Periodic Assessment was performed, and it was recommended that the DSAC III rating remain. However, the updated ER 1110-2-1156 (March 2014) describes DSAC III dams as Moderate Urgency where the incremental risk – combination life, economic, or environmental consequences with likelihood of failure – is moderate. During this PA, the previous stability analysis was discussed and conservative design criteria did not translate to dam safety risk, especially since no signs of instability have been observed, and the embankment has withstood 94% of its design load. Also, the uncontrolled release of water from the Kerr Lake pool through the pump station was deemed highly unlikely to result in life loss due to the relatively small release capacity. However, the PA found that Internal Erosion through the Foundation (PFM IC-

3) and Internal Erosion through the Drain Pipe (PFM IC-15) were the primary risk driver PFM's, necessitating the continuation of the DSAC III rating. This latest IRRMP update utilizes data from a 2013 Periodic Assessment (PA) to update the risk reduction measures list.

3. DISTRICT QUALITY CONTROL

Quality Assurance (QA) design and District Quality Control (DQC) activities are stipulated in ER 1110-1-12, Engineering & Design Quality Management. The subject project IRRMP Update will be prepared by the Wilmington District using the SAW procedures and will undergo DQC. SAW will manage and document the DQC activities. This IRRMP Update will undergo a 100% Final DQC review. The adequacy of the DQC will be verified by the Agency Technical Review Team.

4. AGENCY TECHNICAL REVIEW

Agency Technical Review (ATR) is undertaken to "ensure the quality and credibility of the government's scientific information" in accordance with EC 1165-2-214 and ER 1110-1-12. An ATR will be performed on the IRRMP Update Report.

ATR will be conducted by individuals and organizations that are external to the Wilmington District (SAW). The ATR Team Leader will be a Corps of Engineers employee outside the South Atlantic Division. A site visit will not be required. The required disciplines and experience are described below.

4.1 ATR Team Expertise

As stipulated in ER 1110-1-12, ATR members will be sought from the following sources: regional technical specialists (RTS); appointed subject matter experts (SME) from other districts; senior level experts from other districts; Center of Expertise staff; appointed SME or senior level experts from the responsible district; experts from other U.S. Army Corps of Engineers Districts; contractors; academic or other technical experts; or a combination of the above. The ATR Team will be comprised of the following disciplines; knowledge, skills and abilities; and experience levels.

ATR Team Leader. The ATR lead will be a senior registered professional with experience in earthen dam safety matters 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 geotechnical, site engineering, planning, etc).

Geotechnical Engineer. Team member will be a registered professional engineer familiar with design of earthen dams and evaluations of existing earthen dams. Team member will have a thorough understanding of the specific requirements based on study objectives and proposed measures – for example, slope stability and seepage modeling, to assure that the project/plan meets good engineering practice and dam safety requirements.

Civil/Site Engineer. Team member will be a registered professional engineer and have experience with Civil/Site design and construction that includes embankment design for dams.

4.2 Documentation of ATR

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

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

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

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

The ATR may be certified when all ATR concerns are either resolved or referred to U.S. Army Corps of Engineers South Atlantic Division (CESAD) for resolution and the ATR documentation is complete. A sample certification is included in this Review Plan (see attachment 2).

5. INDEPENDENT EXTERNAL PEER REVIEW (WRDA 2007 Section 2035 Safety Assurance Review)

EC 1165-2-214 provides implementation guidance for both Sections 2034 and 2035 of the Water Resources Development Act (WRDA) of 2007 (Public Law (P.L.) 110-114). The EC addresses review procedures for both the Planning and the Design and Construction Phases (also referred to in USACE guidance as the Feasibility and the Pre-construction, Engineering and Design Phases). The EC defines Section 2035 Safety Assurance Review (SAR), Type II Independent External Peer Review (IEPR). The EC also requires Type II IEPR be managed and conducted outside the Corps of Engineers.

5.1 Type I IEPR

A Type I IEPR is associated with decision documents. This IRRMP update is not a decision document under EC 1165-2-214. Since the IRRMP is not a decision document, a Type I IEPR is not required.

5.2 Type II IEPR, Determination

This IRRMP Update will propose design and construction activities. The factors in determining whether a review of design and construction activities of a project is necessary, as stated under Section 2035 and EC 1165-2-214 along with this review plans' applicability statement which follows.

- (1) The failure of the project would pose a significant threat to human life.

The interim measures to be presented in the IRRMP Update will reduce the threat to human life. The existing dam will be more stable and seepage can be better monitored and measured, overall reducing risks of threats to humans. Construction would incorporate existing engineering standards/methods and will not lead to short term increases in probability of dam failure.

- (2) The proposed measures involve the use of innovative materials or techniques.

The proposed measures will employ standard materials and construction methods familiar to earthwork contractors.

- (3) The project design requires redundancy, resiliency and robustness.

The proposed measures will increase the stability of the current dam. During construction, the stability of the current dam will not be reduced and the dam and pumping station will operate as normally required with full functionality.

- (4) The project has unique construction sequencing or a reduced or overlapping design construction schedule.

The proposed measures are not anticipated to require unique construction sequencing, or a reduced or overlapping design construction schedule. The construction sequence has been used successfully by the Corps of Engineers on other similar works.

As indicated above, this project does not pose a significant threat to human life, and does not trigger any of the EC 1165-2-214 factors for Type II IEPR. Therefore, the District Chief of Engineering, as the Engineer in Responsible Charge has determined that a Type II IEPR of the IRRMP Update is not needed.

6. MODEL CERTIFICATION AND APPROVAL

Models are not necessary for the IRRMP Update.

7. ESTIMATED COSTS AND SCHEDULE

7.1 Project Milestones

IRRMP Update Review (Proposed):

IRRMP Update Report Complete	10 July 2015
District Quality Control Complete	17 July 2015
ATR Begin	19 November 2015
ATR Certification Complete	16 December 2015

7.2 ATR Schedule and Cost

The ATR's will be conducted in FY16. It is envisioned that each reviewer will be afforded 28 hours review plus 4 hours for coordination. It is envisioned that the ATR Leader will be allowed 40 hours if also serving as a reviewer. The estimated cost range is \$10k - \$25k.. The IRRMP Update ATR schedule follows. The dates are based on the completed IRRMP dated July 10, 2015.

ATRT Selected and Resourced (ATR Start)	November 19, 2015
ATRT Completes Comments	November 26, 2015
PDT Completes Evaluations	December 2, 2015
ATRT Completes Back Checks	December 9, 2015
ATR Certification	December 16, 2015

8. POINTS OF CONTACT

Per guidance, the names of the following individual will not be posted on the Internet with the Review Plan. Their titles and responsibilities are listed below.

Wilmington District POCs:

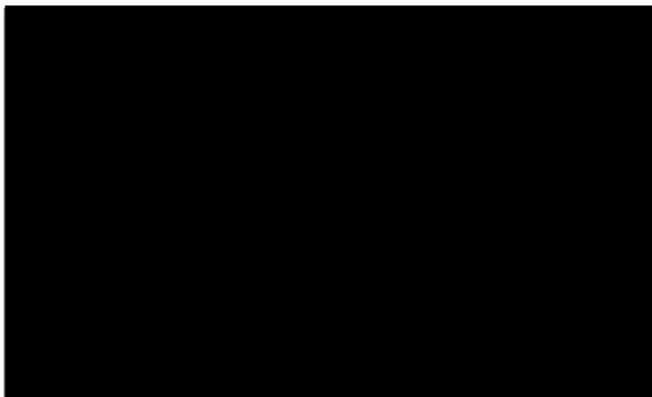
Review Plan, ATR and QM Process,

Acting Dam Safety Program Manager

Chief, Geotechnical
and Dam Safety Section:

Dam Safety Officer:

South Atlantic Division POC:



9. MSC APPROVAL

The MSC for this is the South Atlantic Division. The MSC Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving the Wilmington District, MSC, and RMC) as to the appropriate scope and level of review for the study and endorsement by the RMC. The Review Plan is a living document and may change as the study progresses. The district is responsible for keeping the Review Plan up to date with minor changes since the last MSC. Commander approval will be documented in an Attachment to this plan. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-endorsed by the RMC and re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, will be posted on the District's webpage <http://www.saw.usace.army.mil/Library/ReviewPlans.aspx> and linked to the HQUSACE webpage. The latest Review Plan should also be provided to the RMO and home MSC.

10. PUBLIC PARTICIPATION OF REVIEW PLAN

As required by EC 1165-2-214, the approved Review Plan will be posted on the District public website (<http://www.saw.usace.army.mil/Library/ReviewPlans.aspx>). The public will have 30 days to provide comments on the documents; after all comments have been submitted, the comments will be provided to the technical reviewers. 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 review plan are necessary. This engagement will ensure that the peer review approach is responsive to the wide array of stakeholders and customers, both within and outside the federal government.

Attachment 1

ACRONYMS AND ABBREVIATIONS

ATR – Agency Technical Review
BCOE – Biddability, Constructability, Operability and Environmental
CESAD – U.S. Army Corps of Engineers South Atlantic Division
DCP – District Control Plan
DDR – Design Documentation Report
DQC – District Quality Control
EC – Engineer Circular
EIS – Environmental Impact Statements
ER – Engineer Regulations
HQUSACE – Headquarters U.S. Army Corps of Engineers
IEPR – Independent External Peer Review
MSC – Major Subordinate Command
PDT – Project Delivery Team
PMP – Project Management Plan
P&S – Plans and Specifications
RMC – USACE Risk Management Center
RMO – Review Management Organization
RP – Review Plan
RTS – Regional Technical Specialists
SAD – South Atlantic Division
SAW – Wilmington District
SAR – Safety Assurance Review
SME – Subject Matter Expert
USACE – U.S. Army Corps of Engineers
WRDA – Water Resources Development Act

Attachment 2

COMPLETION OF AGENCY TECHNICAL REVIEW

The _____ District has completed the *(type of product)* of *(project name and location)*. Notice is hereby given that an Agency Technical Review, appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the project's Review Plan. During the Agency Technical Review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing Corps policy. The review also assessed the DQC documentation and made the determination that the DQC activities employed appear to be appropriate and effective. The Agency Technical Review was managed by *(RMO)*. All comments resulting from ATR have been resolved and the comments have been closed in DrCheckssm.

(Signature)
RMO representative

(Date)

(Signature)
ATR Team Leader

(Date)

(Signature)
Project Manager

(Date)

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows:

(Describe the major technical concerns, possible impact, and resolution)

As noted above, all concerns resulting from Agency Technical Review of the project have been fully resolved.

(Signature)
Chief, Engineering, Construction and Planning Division

(Date)

