

**REVIEW PLAN**  
For  
**Plans and Specifications**  
For  
**Eagle Island Disposal Area Improvements**  
Brunswick County, North Carolina  
**Wilmington District**

**24 May 2011**

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## TABLE OF CONTENTS

1. PURPOSE AND REQUIREMENTS .....	2
2. PROJECT INFORMATION AND BACKGROUND .....	3
3. DISTRICT QUALITY CONTROL .....	3
4. AGENCY TECHNICAL REVIEW .....	4
5. INDEPENDENT EXTERNAL PEER REVIEW.....	5
6. MODEL CERTIFICATION AND APPROVAL .....	6
7. BUDGET AND SCHEDULE .....	6
8. POINTS OF CONTACT .....	7

## 1. PURPOSE AND REQUIREMENTS

**a. Purpose.** This Review Plan defines the scope and level of review activities for the Eagle Island Disposal Area Improvements. Eagle Island is a major disposal area for placing dredged material resulting from maintenance and new work dredging for the Wilmington Harbor Navigation project. Improvements needed include raising the dike for Cell Number two, repairs to dike settlement areas in Cell Number Three, ditching within Cell Number three, and Spillway Repairs. The review activities consist of District Quality Control (DQC) and Agency Technical Review (ATR). The Documents to be reviewed are Plans and Specifications and a Design Documentation Report (DDR). Upon approval, this review plan will be included into the Wilmington Harbor Project Management Plan as an appendix to the Quality Management Plan.

### **b. References.**

- (1). ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 Aug 1999
- (2). ER 1110-1-12, Engineering and Design Quality Management, 21 Jul 2006
- (3). (4). EC 1165-2-209, Civil Works Review Policy, 31 January 2010
- (4). Project Management Plan, Wilmington Harbor dated

**c. Requirements.** This review plan was developed in accordance with EC 1165-2-209, 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 work products. The EC outlines three levels of review: District Quality Control, Agency Technical Review, and Independent External Peer Review.

(1) District Quality Control (DQC). DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). It is managed in the home district and may be conducted by staff in the home district as long as they are not doing the work involved in the study, or overseeing contracted work that is being reviewed. Basic quality control tools include a Quality Management Plan providing for seamless review, quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc. Additionally, the PDT is responsible for a complete reading of the report to assure the overall integrity of the report, technical appendices and the recommendations before approval by the District Commander. The Major Subordinate Command (MSC)/District quality management plans address the conduct and documentation of this fundamental level of review.

(2) Agency Technical Review (ATR). ATR is an in-depth review, managed within USACE, and conducted by a qualified team outside of the home district that is not involved in the day-to-day production of the project/product. The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. The ATR team reviews the various work products and assures that all the parts fit together in a coherent whole. ATR teams will be comprised of senior USACE personnel (Regional Technical Specialists (RTS), etc.), and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the parent MSC.

(3) Type II Independent External Peer Review (IEPR). IEPR is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. In accordance with Section 2035 of Water Resources Development Act (WRDA) of 2007 and EC 1165-2-209, a Type II IEPR (SAR) shall be conducted on design and construction activities for hurricane and storm risk management and flood risk management projects, as well as other projects where existing and potential hazards pose a significant threat to human life prior to initiation of physical construction and periodically thereafter until construction activities are

completed. IEPR should occur on a regular schedule sufficient to inform the Chief of Engineers on the adequacy, appropriateness, and acceptability of the design and construction activities for the purpose of assuring public health, safety, and welfare.

**d. Review Management Organization (RMO).** The South Atlantic Division (SAD) is designated as the RMO responsible for managing the review activities described in this Review Plan.

## 2. PROJECT INFORMATION AND BACKGROUND

Wilmington Harbor is located at Wilmington on the southern coast of North Carolina in New Hanover and Brunswick Counties. The Wilmington Harbor project consists of two separable elements, the portion for deepening of the existing project and the portion for raising the dikes on Eagle Island dredged material disposal facility (DMDF) for maintenance of the existing project until the deepening is completed.

Features constructed to date include deepening the ocean bar and entrance channels to the authorized depth 44 feet; deepening the project to 42 feet up from Lower Swash Channel to and including the Between channel; widening the existing 400-foot wide channel to 600 feet over a total length of 6.2 miles including Lower and Upper Midnight and Lower Lilliput reaches; widening five turns and bends by 100 to 200 feet providing a total average channel width of 500 to 675 feet; and widening the Fourth East Jetty Channel to 500 feet over a total length of 1.5 miles.

Features yet to be completed include deepening the anchorage basin immediately upriver from the State Ports Authority dock from 38 feet to 42 feet, and extending the anchorage basin northward by 300 feet deepening the 32-foot channel between Castle Street and the Hilton Railroad Bridge, the 32-foot turning basin just above the mouth of the Northeast Cape Fear river on the west side, and the 25-foot channel from the Hilton Railroad Bridge to 750 feet upstream all to a depth of 38 feet; deepening the 25-foot channel from 750 feet upstream of the Hilton Railroad Bridge to the turning basin near the upstream limits of the project to 34 feet, along with widening of the channel from 200 to 250 feet; and widening the turning basin from 700 to 800 feet.

Improvement to the dredged material disposal facility is also underway by incrementally raising the dikes of three cells on Eagle Island dredged material disposal facility from their current elevations to an ultimate elevation of 40 feet.

The project was authorized by the Water Resources Development Acts of November 17, 1986 (PL 99-662) and October 12, 1996 (PL 104-303) and the Energy and Water Development Appropriations Act, 1998.

a. **Project Description-Eagle Island.** Since the early 1900's the upper portion of Wilmington Harbor has been dredged using a hydraulic cutterhead pipeline dredge with disposal of the dredged material in disposal areas located adjacent to the channel. The Eagle Island CDF, located on the peninsula between the Cape Fear and Brunswick Rivers south of Highway 17, has been the primary disposal site for dredged material from the upper portion of Wilmington Harbor. The Eagle Island CDF is located on a 1,473-acre tract owned by the U.S. Army Corps of Engineers. Eagle Island dikes were constructed in the late 1970's and now encompass approximately 740 acres of diked uplands. The existing Eagle Island CDF currently consists of three cells; Cell 1, Cell 2, and Cell 3 with diked areas of approximately 220, 260 and 260 acres, respectively. Cells are utilized for disposal on a rotating basis and dikes are raised as needed.

**b. Project Background.** The operating plan for the Eagle Island Disposal Area has been to pump dredged material into 1 of the 3 disposal cells each year during the annual Wilmington Harbor maintenance dredging while the other 2 disposal cells are being prepared for dike raising. The other 2 cells are dewatered and ditched to dry out material on the interior of the disposal cells

to provide a source of borrow to raise the dikes. The top of dike elevations are increased in increments of approximately 3 to 6 feet for each dike raise event. The existing approximate top of dike elevations are 39' for Cell 1, 35' for Cell 2, and 34' for Cell 3. There are three spillway systems each in Cells 2 and 3 and two spillway systems in Cell 1. The spillway systems include a box weir and an effluent pipe. The spillway box weirs are raised and relocated as needed for dike raising.

### 3. DISTRICT QUALITY CONTROL

District Quality Control and Quality Assurance activities for implementation documents (DDRs and P&S) are stipulated in ER 1110-1-12, Engineering & Design Quality Management. The subject project DDR and P&S will be prepared by the Wilmington District using the SAW procedures and will undergo DQC. DQC Certification will be verified by the Agency Technical Review Team.

### 4. AGENCY TECHNICAL REVIEW

**a. Scope.** Agency Technical Review (ATR) is undertaken to "ensure the quality and credibility of the government's scientific information" in accordance with EC 1165-2-209 and ER 1110-1-12. An ATR will be performed on the P&S and DDR intermediate and pre-final submittals.

ATR will be conducted by individuals and organizations that are external to the Wilmington District. The ATR Team Leader is a Corps of Engineers employee outside the South Atlantic Division. The required disciplines and experience are described below.

ATR comments are documented in the DrChecks<sup>sm</sup> model review documentation database. DrChecks<sup>sm</sup> is a module in the ProjNet<sup>sm</sup> suite of tools developed and operated at ERDC-CERL ([www.projnet.org](http://www.projnet.org)).

At the conclusion of each ATR effort, the ATR team will prepare a Review Report summarizing the review. Review Reports will be considered an integral part of the ATR documentation and shall:

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their organization affiliations, and include a short paragraph on both the credentials and relevant expertise of each reviewer;
- Include the charge to the reviewer;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issue (if any); 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.

**b. ATR Disciplines.** 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; experts from other USACE commands; 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.

Geotechnical Engineering and Engineering Geology. The team member should be a registered professional. Experience needs to encompass geologic and geotechnical analyses that are used to support the development of Plans and Specifications for navigation projects including dike embankments and disposal areas.

Civil Engineering/Dredging Operations. The team member should be a registered professional engineer with dredging operations and/or civil/site work project experience that includes dredging and disposal operations, embankments, and navigation channels.

NEPA Compliance. The team member should have experience in NEPA compliance activities and preparation of Environmental Assessments and Environmental Impact Statements for navigation or shore protection projects.

ATR Team Leader. The ATR Team Leader should have experience with Navigation Projects and have performed ATR Team Leader duties. ATR Team Leader may be a co-duty to one of the review disciplines.

## 5. INDEPENDENT EXTERNAL PEER REVIEW

**a. General.** EC 1165-2-209 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

**b. Type I Independent External Peer Review (IEPR) Determination.** A Type I IEPR is associated with decision documents. No decision documents are addressed/covered by this Review Plan. A Type I IEPR is not applicable to the implementation documents covered by this Review Plan.

**c. Type II Independent External Peer Review (IEPR) Determination (Section 2035).** This disposal area improvement project does not trigger WRDA 2007 Section 2035 factors for Safety Assurance Review (termed Type II IEPR in EC 1165-2-209) and therefore, a review under Section 2035 is not required. The factors in determining whether a review of design and construction activities of a project is necessary as stated under Section 2035 along with this review plans applicability statement follow.

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

*This project will include raising the dike for disposal Cell Number Two, repairs to dike settlement areas in Cell Number Three, Ditching in Cell Number Three, and Spillway Repairs, and will be constructed in accordance with program requirements and constraints. Failure or loss of the dikes or spillways will not pose a significant threat to human life.*

- (2) The project involves the use of innovative materials or techniques.

*This project will utilize methods and procedures previously used by the Corps of Engineers on other similar works.*

- (3) The project design lacks redundancy.

*The dike design is in accordance with EM 1110-2-1902 Engineering and Design-Slope Stability EM 1110-2-5027, Engineering and Design-Confined Disposal of Dredged Material, and EM 1110-2-1913 Design and Construction of Levees. The manuals do not address the concept of redundancy for dike design.*

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

*This project's construction does not have unique sequencing or a reduced or overlapping design. The installation sequence and schedule has been used successfully by the Corps of Engineers on other similar works.*

#### 6. MODEL CERTIFICATION AND APPROVAL

This Disposal Area Improvement Project does not use any engineering models that have not been approved for use by USACE.

#### 7. BUDGET AND SCHEDULE

##### a. Project Milestones.

Completion of Pre-Final Submittal – 1 JULY 11

District Quality Control – 09 MAY 11 to 4 AUGUST 11

BCOE Review – 12 JULY 11 to 18 JULY 11

ATR Review – 12 JULY 11 to 18 JULY 11

Advertisement – 4 AUGUST 11

b. ATR Estimated Cost. The ATR will be conducted 12 JULY 11 to 18 JULY 11. It is envisioned that each reviewer will be afforded 24 hours review plus 4 hours for coordination. The estimated cost range is \$10-15,000.