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

REPLY TO
ATTENTION OF:

CEMVD-PD-SP

15 Sep 2010

MEMORANDUM FOR Commander, St. Louis District

SUBJECT: Review Plan Approval for Nutwood Drainage and Levee District General Reevaluation Report (GRR) Review Plan

1. References:

a. Memorandum, CEMVS-PM-F, 10 August 2010, subject: Nutwood Drainage and Levee District, Illinois, Flood Risk Management, General Reevaluation Report (GRR) with Environmental Assessment, Review Plan Documentation (encl 1).

b. Memorandum, CESPD-PD-SP, 3 August 2010, subject: Nutwood Drainage and Levee District, Illinois, Flood Risk Management, General Reevaluation report (GRR) with Environmental Assessment Review Plan (encl 2).

2. The enclosed Review Plan, including Checklist (encl 3), for the Nutwood Drainage and Levee District GRR has been prepared in accordance with EC 1165-2-209. The Review Plan has been coordinated with the St. Louis District which is the lead office to execute this plan. For further information, contact [redacted] at [redacted]. The Review Plan includes independent external peer review.

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

4. Any questions regarding this matter should be directed to [redacted], CEMVD-PD-SP, at [redacted]

3 Encls

[redacted]

Major General, USA
Commanding

REVIEW PLAN

NUTWOOD DRAINAGE AND LEVEE DISTRICT, ILLINOIS
FLOOD RISK MANAGEMENT
GENERAL REEVALUATION REPORT WITH ENVIRONMENTAL ASSESSMENT
(Nutwood GRR)

ST. LOUIS DISTRICT

US Army Corps of Engineers ®

August 2010

RP Update – 10 August 2010
FRM-PCX Review Plan Standard

REVIEW PLAN

NUTWOOD DRAINAGE AND LEVEE DISTRICT, ILLINOIS
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ST. LOUIS DISTRICT

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(Nutwood GRR)

ST. LOUIS DISTRICT

1. PURPOSE AND REQUIREMENTS

A. Purpose.

This document outlines the Review Plan for the Nutwood Drainage and Levee District, Illinois, Flood Risk Management, General Reevaluation Report (GRR) with Environmental Assessment. The GRR will address the improvements for the levee system. The Nutwood Drainage and Levee District GRR is a decision document that requires approval of the ASA(CW).

Peer Review of Decision Documents, Engineer Circular (EC) 1105-2-408 dated 31 May 2005, (1) established procedures to ensure the quality and credibility of Corps decision documents by adjusting and supplementing the review process, and (2) required that documents have a peer review plan.

A subsequent circular, *Review of Decision Documents*, EC 1105-2-410, dated 22 August 2008, revises the technical and overall quality control review processes for decision documents. It formally distinguishes between technical review performed by in-district (District Quality Control, "DQC") and out-of-district resources (formerly Independent Technical Review, "ITR," now Agency Technical Review, "ATR"). It also reaffirms the requirement for Independent External Peer Review (IEPR); this is the most independent level of review and is applied in cases that meet certain criteria where the risk and magnitude of a proposed project are such that a critical examination by a qualified team outside of the U.S. Army Corps of Engineers (USACE) is warranted.

Civil Works Review Policy, EC 1165-2-209, dated 31 January 2010, supersedes EC 1105-2-410 and 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).

B. Requirements.

EC 1165-2-209 outlines the requirement of the three review approaches (DQC, ATR, and IEPR). This document addresses review of the decision document as it pertains to both approaches and planning coordination with the appropriate PCX. The Nutwood Drainage and Levee District GRR will address the project flood risk management (FRM) limitations. Therefore, the FRM-PCX is considered to be the primary PCX for coordination.

(1) District Quality Control. 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 District and may be conducted by in-house staff as long as the reviewers are not doing the work involved in the study, including contracted work that is being reviewed. Basic quality

control tools include a Quality Management Plan (QMP) 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 the approval by the District Commander. The Major Subordinate Command (MSC)/District are directly responsible for the quality management (QM) and quality control (QC) respectively, and to conduct and document this fundamental level of review. DQC is required for all decision documents.

(2) Agency Technical Review. EC 1165-2-209 states that an ATR is undertaken to "ensure the quality and credibility of the government's scientific information" in accordance with the reference, and the QM of the responsible MSC. 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.) from outside the home District and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the home MSC. DrChecks (https://www.projnet.org/projnet/) will be used to document all ATR comments, responses, and associated resolution accomplished. ATR is required for all decision documents.

(3) Independent External Peer Review. EC 1165-2-209 states that an 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. An IEPR is generally for feasibility and reevaluation studies and modification reports with Environmental Impact Statements (EIS). For clarity, IEPR is divided into two types, Type I is generally for decision documents and Type II is generally for implementation documents. Type I IEPR reviews are managed outside the USACE, panel members will be selected by an Outside Eligible Organization (OEO) using the National Academies of Science (NAS) policy for selecting reviewers. This applies to new projects and to the major repair, rehabilitation, replacement, or modification of existing facilities. The scope of review will address all the underlying planning, engineering, safety assurance, economics, and environmental analyses performed, not just one aspect of the project. The IEPR will focus on the technical aspects of the project while the ATR will be responsible for the agency and administration's policy review. This Review Plan documents the methodology used to conclude that a Type I IEPR is required for the Nutwood GRR. See Section 5 of this report.

(4) Policy and Legal Compliance Review. In addition to the technical reviews, decision documents will be reviewed throughout the project for their compliance with law and policy. These reviews culminate in Washington-level determinations that the recommendations in the reports and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the Chief of Engineers. Guidance for policy and legal compliance reviews is addressed further in Appendix H of ER 1105-2-100. Technical reviews described in EC 1165-2-209 are to augment and complement the policy review processes by addressing compliance with published Army polices pertinent to planning products, particularly polices on analytical methods and the presentation of findings in decision documents. DQC and ATR efforts are to include the necessary expertise to address compliance with published planning policy. Counsel will generally not participate on ATR teams, but may at the discretion of the district or as directed by higher authority. When policy and/or legal concerns arise during DQC or ATR efforts that are not readily and mutually resolved by the PDT and the reviewers, the District will seek issue resolution support from the MSC and HQUSACE in accordance with the procedures outlined in Appendix H of ER 1105-2-100. Legal reviews will be conducted concurrent with ATR of the draft and final report.

(5) Planning Center of Expertise (PCX) Coordination. EC 1165-2-209 outlines PCX coordination in conjunction with preparation of the Review Plan. This Review Plan is being coordinated with the PCX for Flood Risk Management (FRM). The FRM-PCX is responsible for the accomplishment of ATR for the Nutwood GRR. The DQC is the responsibility of the MSC/District. The FRM-PCX may conduct the review or manage the ATR review to be conducted by others.

(6) Review Plan Approval and Posting. In order to ensure the Review Plan is in compliance with the principles of EC 1165-2-209 and the MSC's QMP, the Review Plan must be approved by the applicable MSC, in this case the Commander, Mississippi Valley Division (MVD). Once the Review Plan is approved, the District will post it to its district public website and notify MVD and the FRM-PCX.

(7) Safety Assurance Review. In accordance with Section 2035 of the Water Resources Development Act (WRDA) 2007, EC 1165-2-209 requires that all projects addressing hurricane and storm damage reduction and flood damage reduction undergo a safety assurance review during design and construction. Safety assurance factors must be considered in all reviews for those studies. Safety assurance review will also be accomplished during project implementation.

2. STUDY INFORMATION

A. Decision Document.

The purpose of the Nutwood Drainage and Levee District General Reevaluation Report is threefold.

- First, the GRR defines the recommended solution to flooding from the Illinois River and Mississippi River for the Nutwood Drainage and Levee District.
- Second, the GRR determines if the authorized levee raise project is justified and meets current needs for reducing risks to the Nutwood Drainage and Levee District and Illinois Routes 100 and 16 from the Illinois River stages.
- Third, the GRR identifies the non-federal partner willing to cost share the project.

Included in the document are refinements to the design and cost estimates, documentation of environmental, archeological, HTRW and permit compliance, assurance of economic feasibility and local sponsor intentions and capabilities and further development of plans to construct the Nutwood Drainage and Levee District project.

The levee raise, which is authorized for construction by the Flood Control Act of October 23, 1962, under provisions of Section 203 of Public Law 87-874, 87th Congress, 2nd Session, and justified in the 1996 Reconnaissance Report, is a joint effort between the Corps of Engineers, representing the Federal Government, and the Nutwood Drainage and Levee District. This is memorialized in a legal agreement between the Federal Government and Nutwood Drainage and Levee District (sponsor). This agreement, presently called a Project Partnership Agreement (PPA), requires that the Nutwood Drainage and Levee District provide all lands, easements, rights of way and relocations as well as a cash contribution. The estimated financial contributions are comprised of the Federal Government (75%) and the sponsor (25%). The Nutwood Drainage and Levee District provided necessary cash contributions during the preconstruction engineering and design phase. There are no in-kind contributions.

B. General Site Description.

The Nutwood Drainage and Levee District is located in Greene and Jersey Counties, Illinois, on the east (left) bank of the Illinois River, between River Miles 15.2 and 23.7 above the confluence with the Mississippi River. The District is bounded on the south by Otter Creek, on the north by Macoupin Creek, on the west by the Illinois River and on the east by bluffs. The width of the District varies from 1.5 miles on the south to approximately 2.5 miles on the north. The area is traversed by Illinois Route 16/100. The

existing 12.5 miles of levee protects approximately 10,360 acres of primarily farmland. Existing maps show the town of East Hardin within the project area, but the town no longer exists. All that remains is one (1) church, one (1) warehouse for a business previously located in the town and three (3) abandoned buildings. All other dwellings and business structures have been removed. Up to three homes are located within the Drainage and Levee District.

C. Study Scope.

The scope of this study includes a levee raise of the existing levee system of the Nutwood Drainage and Levee District to the authorized flood profile. The authorized flood profile is based upon the May 1943 peak flood discharge at Meredosia [123,000 cubic feet per second (cfs)] coincident with a 2 percent chance (or 50-year recurrence interval) elevation from the Mississippi River at Grafton, Illinois.

The Feasibility phase of this project was accomplished in the late 1950s. This resulted in a document titled "Survey Report for Flood Control and Allied Water Uses, Illinois River, Illinois and Tributaries", dated April 1961. This document encompassed flood control measures for the entire Illinois River Basin and was published in House Document No. 472 on 12 July 1962. Later that year, the Nutwood Drainage and Levee District project was authorized for construction by the Flood Control Act of October 23, 1962, under provisions of Section 203 of Public Law 87-874, 87th Congress, 2nd Session.

In the early 1980's the St. Louis District, Corps of Engineers reevaluated several Illinois River levee projects including the authorized Nutwood Drainage and Levee District levee raise. The Reevaluation Report was completed in October 1984 and recommended the authorized project be approved for advance engineering and design and construction.

A General Design Memorandum (GDM) was prepared and approved by the Lower Mississippi Valley Division (LMVD) in October 1986, subject to comments. The GDM investigated basically the same approved plan as the above Reevaluation Report but varied in the manner in which the authorized plan was constructed. Unlike the Reevaluation Report which included a combination of landside and riverside enlargement, the GDM utilized only a riverside levee enlargement.

The authorized plan, as submitted in the GDM, was approved by LMVD on 17 October 1986, subject to comments regarding overtopping risk, environmental and cultural resources, suitability of material in borrow sites, and real estate costs/acreage. Based upon the benefit-to-cost ratio (BCR) using FY1986 interest rates, the project was not economically justified at the then current interest rate and declared inactive on 3 June 1987.

Following the Great Flood of 1993, in which the levee overtopped and breached and the area was completely inundated, the project was re-activated. The Reconnaissance Report with Environmental Assessment, which was initiated in 1996, was approved as a basis for proceeding to Preconstruction Engineering and Design (PED) on 3 June 1997. This report determined that the authorized levee raise project is justified to meet current day needs for reducing risks to the Nutwood Drainage and Levee District and Highways 16/100 from high Illinois River stages. This report also updated hydrologic and hydraulic changes since the project was reevaluated in the early 1980's. Although the authorized hydraulic design criteria for the Nutwood levees is the same as stated in the authorizing document, the Great Flood of 1993 had a dramatic impact on recommended levee profiles. Note that the contents of the 1996 Reconnaissance Report included the requirements of the Feasibility Scoping Meeting (FSM) and Alternative Formulation Briefing (AFB), thus meeting these milestones.

In Fiscal Year 2002, Public Law 107-117 directed the use of available funds to initiate construction. The first allocation for construction was received the same year. The project plan presented in the 1996 Reconnaissance Report will be implemented with changes to reflect new design criteria for seepage berms

(which will require additional borrow, etc). Presently, the plan consists of 65,425 linear feet of levee enlargement (up from 63,850 linear feet recommended in the 1996 Reconnaissance Report), of which 58,367 feet is a riverside enlargement, 5,700 feet is a straddle enlargement and 1,358 feet is new levee. The project, currently in the construction phase, includes 1,245,800 cubic yards of embankment material for the levee raise with seepage berms, a ten foot wide gravel road on top of the levee, eleven (11) relief wells for seepage control in an environmentally sensitive area, construction of a pump station to accommodate an increase in hydraulic head and a mitigation plan for various plantings at three specific locations as well as local drainage channels. The total mitigation acres in the plan will be 16.5 acres of tree plantings and 18.5 acres of emergent/open water wetlands. The increase in levee height averages 3.0 feet, depending on the grade of the existing levee.

Part of the regulatory requirements for this project is a levee permit from the state of Illinois Department of Natural Resources. This permit requires that impacts from an incredibly rare flood event that has never been recorded, be modeled and the impacts to flood heights estimated. This rare event will cause a maximum increase of 5.5 inches of induced flood height at the Nutwood Levee and will be less as you go upstream.

In addition to the mitigation of environmental impacts, eleven structures (seven in Hardin, three in Michael and one in Kampsville, Illinois) will require the purchase of flowage easements due to the increase in water surface elevation caused by the levee height increase. The dimensions of seepage berms, borrow, relief wells and associated impacts to costs and environmental mitigation will change from the 1996 Reconnaissance Report.

D. Factors Affecting the Scope and Level of Review.
The study analyses, while complex, are well within the scope that is typical for similar studies. The design will be standard rather than innovative, precedent-setting, unduly complicated, or vulnerable.

- EC 1165-2-209 requires Type I IEPR if the estimated cost of the proposed project is greater than $45 million. Although this project is estimated to be significantly less ($[redacted] , a Type I IEPR will be conducted in order to adequately address residual risk, risk communication, and uncertainty in the decision documents.
- EC 1165-2-209 requires a Type II IEPR if the proposed project is a Flood Risk Management project where potential hazards pose a significant threat to human life. Nutwood is a Flood Risk Management project. However, it is anticipated the project will not pose a significant threat to human life. Type II IEPR is not anticipated for this study.

E. Problems and Opportunities.
During the flood of 1993, the levee overtopped and breached and the area was completely inundated. This caused a disruption of traffic on Illinois Routes 100 and 16 for over three months. The main purpose of this project is flood damage reduction for the agricultural lands, structures and public infrastructure. A primary benefit would be the continued use of Illinois Routes 100 and 16 during major flood events, but the proposed raise would not protect against the Mississippi River Flood of 1993.

F. Potential Methods.
This proposed levee improvement project will create induced flooding impacts in areas upstream of the project during large flood events that would currently overtop the existing levee. These upstream induced flooding impacts are created by a combination of Mississippi River stages at Grafton, Illinois and Illinois River flow that would overtop the existing Nutwood levee, but would not overtop the proposed Nutwood levee raise/improvement.

To determine which structures are affected by induced flooding due to a raise to the levee in the Nutwood Drainage and Levee District, the U.S. Army Corps of Engineers utilized the results of "worst case analysis" flood modeling as required per the Illinois Department of Natural Resources (IDNR) Part 3700 rules for Construction in the Floodways of Rivers, Lakes and Streams. The "worst case analysis" would induce a maximum flood increase of 5.5 inches (0.4 feet) in the vicinity of the project area. The induced flooding would propagate approximately 60 miles upstream to the LaGrange Lock and Dam (River Mile 80.0). This "worst case analysis" was based on a greater than 50-year flood event on the Mississippi River, water at the top of the freeboard, and with a discharge of 172,200 cubic feet per second (cfs) on the Illinois River. The "worst case analysis" flood equals a 345-year flood at Hardin, a 500-year flood at Kampsville, and much greater than a 500-year flood at Merodosia. This is an exceedingly rare event used for this "worst case analysis". This event has never been recorded and is different than the Illinois and Mississippi River flows used to determine levee grades for Nutwood Drainage and Levee District as authorized by Congress. Note that the Nutwood project plan levee grade includes 2 feet of freeboard added to the authorized water surface profile.

3. DISTICT 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 District and may be conducted by in-house staff as long as the reviewers are not doing the work involved in the study, including contracted work that is being reviewed.

Per EC 1165-2-209, Paragraph 8d, for each ATR event, the ATR team will examine, as part of its ATR activities, relevant DQC records and provide written comments in the ATR report as to the apparent adequacy of the DQC effort for the associated product or service.

A. Documentation of DQC.

DQC responsibilities are as follows:

1) Reviewers shall review the draft report to confirm that work was done in accordance with established professional principles, practices, codes, and criteria and for compliance with laws and policy. Comments shall be submitted into DrChecks.

2) Reviewers shall pay particular attention to one's discipline but may also comment on other aspects as appropriate. Reviewers that do not have any significant comments pertaining to their assigned discipline shall provide a comment stating this.

3) Grammatical and editorial comments shall not be submitted into DrChecks. Comments should be submitted to the DQC Leader via electronic mail using tracked changes feature in the MS Office compatible document or as a hard copy mark-up. The DQC Leader shall provide these comments to the Project Manager.

4) Review comments shall contain these principal elements:
   - a clear statement of the concern
   - the basis for the concern, such as law, policy, or guidance
   - significance for the concern
   - specific actions needed to resolve the comment

5) The "Critical" comment flag in DrChecks shall not be used unless the comment is discussed with the DQC Leader and/or the Project Manager first.

B. Products to Undergo DQC.

The products to be reviewed in this study include:

- Draft GRR
- Final GRR

4. AGENCY TECHNICAL REVIEW PLAN

In addition to District Quality Control, an Agency Technical Review will be conducted for the Nutwood GRR. The ATR will be managed by the PCX. The FRM-PCX will identify individuals to perform ATR. The St. Louis District will provide suggestions on possible reviewers.

A. General.
An ATR Leader shall be designated by the PCX for the ATR process. The proposed ATR Leader for this project is to be determined, but will have expertise in flood risk management, specifically levees. The ATR Leader is responsible for providing information necessary for setting up the review, communicating with the PDT, providing a summary of critical review comments, collecting grammatical and editorial comments from the ATR team (ATRT), ensuring that the ATRT has adequate funding to perform the review, facilitating the resolution of the comments, and certifying that the ATR has been conducted and resolved in accordance with policy. ATR will be conducted for project planning, environmental compliance, economics, civil design, geotechnical engineering, cost engineering, real estate, cultural resources; reviews of more specific disciplines maybe identified if necessary. The ATR lead will be from outside the home MSC. The leader of the ATR team will participate in milestone conferences to address review concerns.

EC 1165-2-209, *Civil Works Review Policy*, requires coordination with the Cost Engineering Directory of Expertise (DX) located in the Walla Walla District, which will produce the cost engineering review and resulting certification.

B. Agency Technical Review Team (ATRT).
The ATRT will be comprised of individuals that have not been involved in the development of the decision document and will be chosen based on expertise, experience, and/or skills. The members will roughly mirror the composition of the PDT and wherever possible, reside outside of the MSC. In general, the review team members will each have a minimum of 10 years experience and education in their respective discipline. A statement of qualifications is required for each discipline prior to acceptance as a review team member and for any subsequent changes. It is anticipated that the team will consist of about eight reviewers. The ATRT members will be identified at the time the review is conducted and will be presented in appendix B. General descriptions of ATR disciplines are as follows:

Geotechnical: Team member will be experienced in levee & floodwall design, post-construction evaluation, and rehabilitation. A certified professional engineer is recommended.

Hydrology and Hydraulics: Team member will be experienced in the field of hydrology and hydraulics, with a thorough understanding of flood risk management and modeling. Team member will also have experience with Hydrologic Engineering Center River Analysis System (HEC-RAS). A certified professional engineer is recommended.

Economics: Team member will be experienced in civil works and related flood risk management projects and have an understanding of Hydrologic Engineering Center Flood Damage Assessment (HEC- FDA).

Plan Formulation: Team member will be experienced with the civil works process and current flood risk management planning and policy guidance.

Environmental: Team member will be experienced in National Environmental Policy Act (NEPA) process and analysis, and have a biological or environmental background.

Cultural Resources: Team member will be experienced in cultural resources and tribal issues, regulations, and laws.

Civil / Site: This discipline may require a dedicated team member, or may be satisfied by a geotechnical reviewer, depending on individual qualifications. Team member will have experience in flood risk management projects. A certified professional engineer is suggested.

Cost Estimating: Team member will be familiar with cost estimating for similar civil works projects using Micro-Computer Aided Cost Estimating System (MCACES). Team member will be a Certified Cost Technician, Certified Cost Consultant, or Certified Cost Engineer.

Real Estate: Team member will be experienced in federal civil work real estate laws, policies and guidance. Members shall have experience working with respective sponsor real estate issues.

Other disciplines/functions involved in the project included as needed with similar general experience and educational requirements.

C. Funding

(1) The PDT district shall provide labor funding by cross charge labor codes. Funding for travel, if needed, will be provided. The project manager will work with the ATR Leader to ensure that adequate funding is available and is commensurate with the level of review needed. The total cost estimate for the ATR effort is budgeted at $[redacted] Any funding shortages will be negotiated on a case by case basis and in advance of a negative charge occurring.

(2) The ATR Leader shall provide organization codes for each team members and a responsible financial point of contact (CEFMS responsible employee) for creation of labor codes.

(3) Reviewers shall monitor individual labor code balances and alert the ATR Leader to any possible funding shortages.

D. Timing and Schedule

(1) Throughout the development of this document, the PDT will conduct seamless review to ensure project quality.

(2) The ATR will be conducted on the draft and final Nutwood GRR.

(3) The PDT will hold a “page-turn” session to review the draft report to ensure consistency across the disciplines and resolve any issues prior to the start of ATR.

(4) The ATR process for this document will follow the following timeline. Actual dates will be scheduled once the period draws closer. All products produced for these milestones will be reviewed.

ATR Timeline

Task	Date
ATR Scoping Meeting	TBD
Start ATR for Draft GRR	TBD
Complete ATR for Draft GRR	TBD
Start ATR for Final GRR	TBD
Complete ATR for Final GRR	TBD

Note: Dates pending revised mapping due to increase in size of seepage berms which are required for new design criteria. Surveying is expected to be conducted in January 2011. Based on the results, additional borrow requirements will be determined. Depending on the amount of additional borrow, the existing approved borrow sites may or may not suffice.

E. Review

(1) ATRT responsibilities are as follows:

(a) Reviewers shall review the draft report to confirm that work was done in accordance with established professional principles, practices, codes, and criteria and for compliance with laws and policy. Comments shall be submitted into DrChecks.

(b) Reviewers shall pay particular attention to one's discipline but may also comment on other aspects as appropriate. Reviewers that do not have any significant comments pertaining to their assigned discipline shall provide a comment stating this.

(c) Grammatical and editorial comments shall not be submitted into DrChecks. Comments should be submitted to the ATR Leader via electronic mail using tracked changes feature in the MS Office compatible document or as a hard copy mark-up. The ATR Leader shall provide these comments to the Project Manager.

(d) Review comments shall contain these principal elements:

- a clear statement of the concern
- the basis for the concern, such as law, policy, or guidance
- significance for the concern
- specific actions needed to resolve the comment

(e) The "Critical" comment flag in DrChecks shall not be used unless the comment is discussed with the ATR Leader and/or the Project Manager first.

(2) PDT responsibilities are as follows:

(a) The PDT shall review comments provided by the ATRT in DrChecks and provide responses to each comment using "Concur", "Non-Concur" or "For Information". *Concur* responses shall state what action was taken and provide revised text from the report if applicable. *Non-Concur* responses shall state the basis for the disagreement or clarification of the concern and suggest actions to negotiate the closure of the comment.

(b) PDT members shall discuss any "Non-Concur" responses prior to submission with the PDT and ATRT Leader.

F. Resolution

(1) Reviewers shall back check PDT responses to the review comments and either close the comment or attempt to resolve any disagreements. Conference calls shall be used to resolve any conflicting comments and responses.

(2) A reviewer may close a comment if the comment is addressed and resolved by the response, or if the reviewer determines that the comment was not a valid technical comment as a result of a rebuttal, clarification, or additional information, or because the comment was advisory, primarily based on individual judgment or opinion, or editorial. If reviewer and responder cannot resolve a comment, it should be brought to the attention of the ATR Leader and, if not resolved by the ATR Leader, it should be brought to the attention of the planning chief who will need to sign the certification. ATRT members shall keep the ATR Leader informed of problematic comments. The vertical team will be informed of any policy variations or other issues that may cause concern during Headquarters review.

G. Certification

ATR certification is required for the draft and final reports. See Appendix A for ATR certification statement. A summary report of all comments and responses will follow this statement and accompany the report throughout the report approval process.

5. INDEPENDENT EXTERNAL PEER REVIEW PLAN

A. General.
IEPR is conducted for decision documents if there is a vertical team decision that the covered subject matter meets certain criteria (described in EC 1165-2-209) where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside the USACE is warranted. IEPR is coordinated by the appropriate PCX and managed by an Outside Eligible Organization (OEO) external to the USACE. It is not anticipated that the public, including scientific or professional societies, will be asked to nominate potential external peer reviewers. It is not anticipated that the Corps will nominate any reviewers for the IEPR. IEPR panels shall evaluate whether the interpretations of analysis and conclusions based on analysis are reasonable. To provide effective review, in terms of both usefulness of results and credibility, the review panels should be given the flexibility to bring important issues to the attention of decision makers. However, review panels should be instructed to not make a recommendation on whether a particular alternative should be implemented, as the Chief of Engineers is ultimately responsible for the final decision on a planning or reoperations study. IEPR panels will accomplish a concurrent review that covers the entire decision document and will address all the underlying engineering, economics, and environmental work, not just one aspect of the study. Whenever feasible and appropriate, the office producing the document shall make the draft decision document available to the public for comment at the same time it is submitted for review (or during the review process) and sponsor a public meeting where oral presentations on scientific issues can be made to the reviewers by interested members of the public. Total cost for the IEPR effort is budgeted at between $[redacted] and $[redacted].

B. Decision on IEPR.
The St. Louis District, with concurrence from the Mississippi Valley Division, has concluded that the Nutwood Drainage and Levee District, Illinois Flood Risk Management General Reevaluation Report

with Environmental Assessment in Greene and Jersey Counties, Illinois, does require IEPR as defined in the WRDA of 2007 (Public Law 110-114) and EC 1165-2-209.

C. Products for Review.
The product for review is the Nutwood General Reevaluation Report with Environmental Assessment (Nutwood GRR). It is expected that an Environmental Assessment will be the required NEPA documentation for review. An Environmental Impact Statement (EIS) is not anticipated to be required. Close coordination with the sponsor and previous public meetings have indicated that there is no significant public dispute with regard to the proposed project. Similarly, no significant public dispute is anticipated with regards to cultural or archeological interests. Methods and models used in this study are typical of all Corps Flood Risk Management studies with little room for interpretation and are not expected to change prevailing practices on this or future Flood Risk Management studies.

D. Required IEPR Panel Expertise.
IEPR Type I:

- Economist – the panel member should have experience in flood risk management projects and a thorough understanding of benefit/cost analyses to include flood risk management interests.
- Cost Engineer: the panel member should have experience with Flood Risk Management projects. Team member should be familiar with cost estimating for similar Flood Risk Management projects.
- Geotechnical Engineer: the panel member should have experience with levee & floodwall design, post-construction evaluation, and rehabilitation. A certified professional engineer is recommended.
- Hydraulic Engineer: the panel member should be knowledgeable concerning current standards and methodology to do digital hydraulic modeling of river flows.
- Environmental: the panel member should be familiar with the NEPA and HTRW process for similar studies and projects. Experience should include knowledge of Flood Risk Management, HTRW, Cultural Resources and Ecosystem Restoration.

E. Documentation of IEPR.
DrChecks review software will be used to document IEPR comments and aid in the preparation of the Review Report. Comments should address the adequacy and acceptability of the economic, engineering and environmental methods, models, and analyses used. IEPR comments should generally include the same four principal elements as described for ATRT comments in Section 4. The OEO will be responsible for compiling and entering comments into DrChecks. The IEPR team will prepare a Review Report that will accompany the publication of the final report for the project and shall:

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

The final Review Report will be submitted by the IEPR panel no later than 60 days following the close of the public comment period for the draft decision document. The report will be considered and documentation prepared on how issues were resolved or will be resolved by the District Commander before the district report is signed.

F. Summary of Factors
Paragraphs 11.d.1 and Appendix D of EC 1165-2-209 delineate the factors that require a Type I IEPR. Evaluations of individual decision criteria are provided below:

- Is there a significant threat to human life?

No. The project involves raising an existing levee up to three feet. There are no extensive safety concerns if this levee is not raised. The area in question is comprised of approximately 10,360 acres of rural land including up to three residences. The flood threat is from the Mississippi and Illinois Rivers, both of which rise slowly during flood conditions. The greatest threat to the raised levee being compromised stems from the authorized flood profile coincident with a 2 percent chance (or 50-year recurrence interval) elevation from the Mississippi River at Grafton, IL. Although the levee overtopped and breached from the overtopping during the flood of 1993 and completely inundated the area, zero injuries or fatalities were reported. If a future similar flood overtopped and breached the raised levee, it is believed that sufficient warning would be given in order to avoid injuries and fatalities. Preparation time for potential flooding conditions include many days, if not weeks. Once water is high enough to overtop, residents have at least 24 hours to evacuate prior to a significant threat to human life. Risk to human safety will be thoroughly and continuously assessed throughout formulation of the project.

- Is the total project cost estimated to exceed $45 million?

No. The total cost of the recommended project is $[redacted] and significantly under the threshold of $45 million cited in Appendix D of the reference as requiring an Independent External Peer Review.

- Requested by State Governor of an affected state?

No.

- Requested by head of a Federal or state agency charged with reviewing the project study if he/she determines that the project is likely to have a significant adverse impact on environmental, cultural, or other resources under the jurisdiction of the agency after implantation of proposed mitigation plans?

No. There are no cultural, historic or tribal resources affected; nor are there adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures. Additionally, there are no adverse impacts on a species listed as endangered or threatened species under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) or the critical habitat of such species designated under such Act.

- Is there significant public dispute as to the size, nature or effects of the project, or as to the economic or environmental cost or benefit of the project?

No. The public has been apprised of the project and no significant disputes as to size, nature or effects of the project are known to exist. Additionally, no significant public disputes are present as to the economic or environmental cost or benefit of the project. Prior to receiving the Construction in Illinois Floodways Permit by the Illinois Department of Natural Resources, much coordination with the public was required and conducted. Additionally, MVS conducted analyses and studies to determine the effects this levee raise will have along 80 miles of the Illinois River. Out of approximately 2000 structure owners along the river, 11 will experience water on them for the first time with the levee raise versus without if and when an Illinois River flood of up to a 500-year magnitude would occur. This equates to approximately $1,000 worth of induced damages. The majority of the structures in the vicinity of the project will already be extensively flooded with or without the levee raise should this flood occur. The State of Illinois determined, based on the results of our findings, that the adverse effects were not significant enough to withhold the Permit.

- Is the plan based on novel methods, presents complex challenges for interpretation, contains precedent-setting methods or models, or presents conclusions that are likely to change prevailing practices?

No. The proposed project is not determined to be highly complex. It is, however, determined to be a straightforward plan to raise the existing levee up to three feet. The recommended project is considered routine as the U.S. Army Corps of Engineers and industry have substantial experience in levee raises.

6. MODEL CERTIFICATION

The use of certified or approved models for all planning activities is required by EC 1105-2-407. The Flood Risk Management Center of Expertise (FRM-PCX) will be responsible for model certification/approval. The goal of certification/approval is to establish that planning products are theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. The use of a certified or approved model does not constitute technical review of the planning product. Independent review of the selection and application of the model and the input data and results is still required through conduct of DQC, ATR, and, if appropriate, IEPR. Models used during development of the Nutwood GRR include the following:

A. Planning Models.

- Hydrologic Engineering Center Flood Damage Assessment (HEC- FDA) Risk Based Model, version 1.2.4. This model, developed by the Corps' Hydrological Engineering Center, will assist the PDT in applying risk analysis methods for flood Risk Management studies as required by, EM 1110-2-1419. This program:
    - Provides a repository for both the economic and hydrologic data required for the analysis
    - Provides the tools needed to understand the results
    - Calculates the Expected Annual Damages and the Equivalent Annual Damages
    - Computes the Annual Exceedence Probability and the Conditional Non-Exceedence Probability
    - Implements the risk-based analysis procedures contained in EM 1110-2-1619
- Institute for Water Resources (IWR) - Planning Suite, version 1.0.11.0. This modes does incremental cost analysis which helps to assign a cost to the habitat units gained by each implementable practice. The analysis will help define which practices are most cost effective which will help in developing alternatives. There is also an additional module for Multi Criteria Decision Analysis that will be used in the decision making.
- Habitat values will be calculated once mitigation requirements have been determined:
    - US Fish and Wildlife Service Habitat Suitability Index (HSI) – Specific HSI models are to be determined. The approvals of the specific models will be coordinated with the Ecosystem Planning Centers of Expertise (ECO-PCX).
    - Aquatic Habitat Appraisal Guide (AHAG) and Wildlife Habitat Appraisal Guide (WHAG) – these two models have been used extensively in the Mississippi Valley in the past and are in the model certification process.

HEC-FDA v1.2.4 and IWR-Planning Suite v1.0.11.0 are both certified models. HSI models will be coordinated through the PCX as needed. AHAG and WHAG are in the process of being certified.

B. Engineering Models.

- Hydrologic Engineering Center River Analysis System (HEC-RAS), version 4.0 (used in Mitigation Report dated August 2008). HEC-RAS is software that allows the user to perform one-dimensional steady and unsteady flow river hydraulics calculations. Used for the unsteady dam break model. HEC-RAS major capabilities are:
    - User interface
    - Hydraulic Analysis
    - Data storage and Management
    - Graphics and reporting
- Microcomputer Aided Cost Engineering System (MCACES) Gold, Version 5.30. This system was developed by Tri-Services Cost Engineering System and is used for the development of

detailed cost estimates.

7. PUBLIC REVIEW

The public had opportunities to participate in this study as part of the NEPA process. Additionally, prior to receiving the Construction in Illinois Floodways Permit by the Illinois Department of Natural Resources, much coordination with the public was required and conducted. The approved Review Plan will be posted to the District's public website for public comment and consideration of public comments.

8. STUDY TEAMS AND PLANNING CENTERS OF EXPERTISE COORDINATION

A. Project Delivery Team.

The PDT is comprised of those individuals directly involved in the development of the decision document. Individual contact information and disciplines are presented in appendix B.

B. Vertical Team.

The Vertical Team includes District management, District Support Team (DST) and Regional Integration Team (RIT) staff as well as members of the Planning of Community of Practice (PCoP). Specific points of contact for the Vertical Team can be found in Appendix B.

C. PCX.

The appropriate PCX for this document is the National Flood Risk Management Center of Expertise located at SPD. This Review Plan will be submitted to the FRM-PCX Program Manager for review and comment. For ATR, the PCX is requested to nominate the ATR team as discussed in paragraph 4.b. above. No additional authorization by Congress is anticipated to be required to address the recommended project at the Nutwood Drainage and Levee District.

D. Review Plan Points of Contact.

The Points of Contact for questions and comments to this Review Plan are as follows:

1. District Point of Contact: [redacted]
2. MSC Point of Contact: [redacted]
3. FRM-PCX Point of Contact: [redacted]

E. Execution Plan.

(1) Reviews' Rotation: PCX shall avoid repeated use of the same reviewer on multiple studies or reports unless essential and comparable expertise cannot be obtained elsewhere.
(2) Reviewers' Conflicts: PCX shall ensure that reviewers serving as Federal Employees (including special government employees) comply with applicable Federal ethics requirements. In selecting reviewers who are not Federal government employees, PCX shall adopt or adapt the National Academy of Sciences' policy for committee selection with respect to evaluation of the potential for conflicts (e.g., those arising from investments; agency, employer, and business affiliations; grants, contracts and consulting income).
(3) Reviewer's Privacy: Peer reviewers' name, credentials and affiliations will be disclosed but will comply with the requirements of the Privacy Act.
(4) Reviewer's Compensation: Reviewer will be paid labor and any necessary travel and per diem expenses in accordance with their contract with the Outside Eligible Organization (OEO).
(5) Reviewers' Charge: The PCX will prepare the reviewers' charge.
(6) Confidentiality: Review shall be conducted in a manner that respects confidential business information and intellectual property.

(7) Choice of Review Mechanism: The PCX will select reviews according to the complexity and importance of this project for both the ATR and the IEPR.
(8) Reviewers Access to Information: PCX shall provide reviewers with sufficient information, including background information about key studies or models, to enable them to understand the data, analytic procedures, and assumptions used to support the key findings or conclusion. Reviewers shall be informed of applicable access, objectivity, reproducibility and other quality standards under the federal laws governing information access and quality.
(9) Disclaimer: Information distributed for review must include the following disclaimer: "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."
(10) Public Comments: Public comments will be accepted and are encouraged through the use of public meetings with access to documents. The PCX will be provided with comments collected at the public meetings. Time limits will be set on public participation to avoid delaying USACE activities.
(11) Transparency: The PCX shall notify reviewers in advance regarding the extent of disclosure and attribution planned by USACE. The PCX shall instruct the ATR leader or the OEO to prepare a Review Report that shall:
- Disclose the names of the reviewers, their organization affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer.
- Include the charge to the reviewers.
- Describe the nature of their review and their findings and conclusions
- Include a verbatim copy of each reviewer's comments (either with or without attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

9. APPROVALS

The PDT will carry out the Review Plan as described. The Project Manager will submit the Review Plan to the FRM-PCX for review and recommendation for approval. After FRM-PCX review and recommendation, the PDT District Planning Chief will forward the Review Plan to MVD for commander approval. Formal coordination with FRM-PCX will occur through the PDT District Planning Chief.

APPENDIX A

ATR CERTIFICATION TEMPLATE (as modified by FRM-PCX)

STATEMENT OF TECHNICAL REVIEW

COMPLETION OF QUALITY ASSURANCE REVIEW AND AGENCY TECHNICAL REVIEW

The District has completed the *District Quality Control (DQC)* of the *Nutwood Drainage and Levee District, Illinois Flood Risk Management General Reevaluation Report with Environmental Assessment*. Notice is hereby given that (1) a Quality Assurance review has been conducted as defined in the Quality Assurance Plan and (2) an agency technical review that is appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the project's Project Management 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, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the result, including whether the product meets the customer's needs consistent with law and existing Corps policy. The review also assessed the DQC documentation and made the determination that the DQC activities employed appear to be appropriate and effective. The ATR was accomplished by an agency team composed of staff from outside the home district. Additionally, the ATR team leader was from outside the home MSC. All comments resulting from QA and the ATR have been resolved.

(Signature) (Date)
Technical Review Team Leader Date

(Signature) (Date)
Project Manager Date

CERTIFICATION OF QUALITY ASSURANCE REVIEW AND 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) (Date)
Lead, Review Management Organization Date

(Signature) (Date)
Chief, Planning Division Date

(Signature) (Date)
Chief, Engineering Division Date

APPENDIX B

PROJECT DELIVERY TEAM

Name	Discipline	Phone	Email
[redacted]	Project Manager	[redacted]	[redacted]
[redacted]	Civil Design		
[redacted]	Structural Engineering		
[redacted]	Hydraulics		
[redacted]	Ecological		
[redacted]	Ecological		
[redacted]	Economics		
[redacted]	Real Estate/Lands		
[redacted]	Real Estate/Lands		
[redacted]	Geotechnical Engineering		
[redacted]	Geotechnical Engineering		

AGENCY TECHNICAL REVIEW TEAM

Name	Discipline	Years of Experience	Phone	Email
TBD	ATR Leader			
TBD	Civil Design			
TBD	Hydrology & Hydraulics			
TBD	Environmental			
TBD	Economics			
TBD	Cost Engineering			
TBD	Real Estate/Lands			
TBD	Cultural Resources			
TBD	Geotechnical Engineering			

INDEPENDENT EXTERNAL PEER REVIEW PANEL

Name	Discipline	Phone	Email
TBD	Economics		
TBD	Cost Engineering		
TBD	Geotechnical Engineering		
TBD	Hydraulic Engineer		
TBD	Environmental		

VERTICAL TEAM

Name	Discipline	Phone	Email
[redacted]	District Support Team Lead	[redacted]	[redacted]
[redacted]	Regional Integration Team		

PLANNING CENTER OF EXPERTISE
FLOOD RISK MANAGEMENT

Name	Discipline	Phone	Email
[redacted]	Program Manager, PCX Flood Risk Management	[redacted]	[redacted]

APPENDIX C

ACRONYMS AND ABBREVIATIONS

Term	Definition	Term	Definition
ASA(CW)	Assistant Secretary of the Army for Civil Works	MVS	St. Louis District
ATR	Agency Technical Review	NEPA	National Environmental Policy Act
ATRT	Agency Technical Review Team	OEO	Outside Eligible Organization
DQC	District Quality Control	PCoP	Planning Community of Practice
DST	District Support Team	PCX	Planning Center of Expertise
DX	Directory of Expertise	PDT	Project Delivery Team
EA	Environmental Assessment	PL	Public Law
EC	Engineer Circular	PMP	Project Management Plan
EIS	Environmental Impact Statement	QMP	Quality Management Plan
EO	Executive Order	QC	Quality Control
ER	Engineer Regulation	QM	Quality Management
FRM	Flood Risk Management	RIT	Regional Integration Team
GRR	General Reevaluation Report	RP	Review Plan
HTRW	Hazardous, Toxic & Radioactive Waste	RTS	Regional Technical Specialist
IEPR	Independent External Peer Review	SAR	Safety Assurance Review
ITR	Independent Technical Review	SPD	South Pacific Division
MSC	Major Subordinate Command	USACE	U.S. Army Corps of Engineers
MVD	Mississippi Valley Division	WRDA	Water Resources Development Act