DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
P.O. BOX 59
LOUISVILLE, KENTUCKY 40201-0059

REPLY TO
ATTENTION OF:

18 Feb 14

CELRL-OP-E

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers, Great Lakes and Ohio River Division, 550 West Main Street, Rm. 10032, Cincinnati, OH 45202-3222 (ATTN: Adrienne Gordon, CELRD-PDS-L)

SUBJECT: Louisville District's Spring Flooding, IN-KY 2013 Project Information Report (PIR) Review Plan.

1. Please find the enclosed Review Plan for the Spring Flooding, IN-KY 2013 PIR's for your review and approval. This Review Plan has been completed in accordance with EC 1165-2-214 "Civil Works Review," dated 15 December 2012, and reflects the projects current status.

2. I recommend that the subject Review Plan be approved. Upon your review and approval, the Review Plan will be posted on the Louisville District website in accordance with EC 1165-2-214.

3. If you have any questions or need additional information, please contact Charles Oliver, CELRL-OP-E, at (502) 315-6921.

Encl

LUKE T. LEONARD
COL, EN
Commanding

Decision Document and Implementation Phase Review Plan

For

Flood Control and Coastal Emergency (FCCE) Levee Rehabilitation Projects
Spring Flooding, IN – KY, 2013

Louisville District

MSC Approval Date: *Pending*
Last Revision Date: *None*

US Army Corps
of Engineers ®

Decision Document and Implementation Phase Review Plan
For
Flood Control and Coastal Emergency (FCCE) Levee Rehabilitation Projects
Spring Flooding, IN- KY, 2013

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1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope and level of peer review for both the Project Information Reports (PIRs) as decision documents and plans and specifications for the implementation phase related to levee systems that were affected by the Spring Flooding, IN – KY, 2013. The projects include Russell Allison-Ambraw Levee in Lawrence Illinois; Brevoort Levee Segment in Knox County, Indiana; Wabash Levee Unit # 5 in Gibson and Posey Counties, Indiana; and the Gill Township Levee System in Sullivan County, Indiana. These PIRs were written by the U.S. Army Corps of Engineers (USACE) Louisville District (LRL) under the general direction of the USACE Great Lakes and Ohio River Division (CELRD). LRL is responsible for preparing the PIRs and engineering documents in accordance with the applicable references.

Upon ATR Certification of the PIRs, the USACE Great Lakes and Ohio River Division (CELRD) will review the PIRS and make any necessary comments to LRL. After LRL has made the revisions and incorporated comments into the PIRs, CELRD will recommend that the Division Deputy Commander approve, or conditionally approve, the PIRs to commit Federal funds for engineering and design (E&D).

b. **References**

(1) ER 500-1-1 Emergency Employment of Army and Other Resources - Civil Emergency Management Program, 30 September 2001
(2) EP 500-1-1 Emergency Employment of Army and Other Resources - Civil Emergency Management Program - Procedures, 30 September 2001
(3) Engineering Circular (EC) 1165-2-214, Civil Works Review, 15 Dec 2012
(4) EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2013
(5) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
(6) Decision Document and Implementation Phase Project Management Plan (PMP) for Levee Rehabilitation Projects for the 2013 Flood Event
(7) Major Subordinate Command (MSC) and/or District Quality Management Plan(s)
(8) ER 11-1-321, Army Programs, Value Engineering, 01 January 2013

c. **Requirements.** This Decision Document and Implementation Phase 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 outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review. In addition to these levels of review, decision documents are subject to cost engineering review and certification (per EC 1165-2-214) and planning model certification/approval (per EC 1105-2-412).

d. **Factors Affecting the Scope and Level of Review.** This review plan describes the required review processes and levels of review for the Levee Rehabilitation Projects for the 2013 Flood Event. This Review Plan is a standalone document and accompanies the Project Management Plan. DQC will be managed from within the district in accordance with the PMP and District Quality Management Plans. The ATR team member(s) are identified by LRD as the RMO. The ATR team lead (NWK) was

selected from outside the home MSC. A second ATR team member(s) LRH was selected from outside the home district (LRL) that produces the work products (i.e., PIRs and Plans and Specifications). ATR cost engineering for the PIRs as decision documents, shall be reviewed by Walla Walla Cost Engineering MCX. At this time no IEPR is anticipated.

e. **In-Kind Contributions.** Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. All of the levees are federally-constructed levees with the exception of the Russell Allison-Ambraw Levee which is non-Federally constructed. Requirements of the public sponsor(s) are defined in ER 500-1-1, paragraph 5-10 a and b, under Cooperation Agreements (CAs) for Non-Federal FCWs and Federal FCWs, respectively for the applicable category of FCWs. Sample CAs for both Non-Federal and Federal FCWs are provided in Appendix C of EP 500-1-1.

   Cost share determination(s) for the levee rehabilitation projects, whether Non-Federal or Federal, shall be in accordance with ER 500-1-1, paragraph 5-11, Cost Share Determination. Sub-paragraph 5-11,a. defines Cost Share Percentages for cost sharable items, for Non-Federal or Federal projects. Subparagraph 5-11, b, defines USACE Costs. Subparagraph 5-11,c, defines the items that the public sponsor must provide at 100 percent local cost which include (1) any costs associated with normal a-b-c's; (2) accomplishment of normal or deferred or deficient maintenance items; and (3) any betterments to the project.

2. REVIEW MANAGEMENT ORGANIZATION (RMO)

The RMO is responsible for managing the overall peer review effort described in this Review Plan. The RMO for decision documents is typically either a Planning Center of Expertise (PCX) or the Risk Management Center (RMC), depending on the primary purpose of the decision document. The RMO for the peer review effort described in this Review Plan is the Major Subordinate Command (MSC), CELRD. CELRD's initial responsibility as the RMO is to review the district's draft review plan. Once any necessary corrections are made, CELRD processes the review plan for Division Commander Approval. Upon approval by the Division Commander, LRL will post the approved review plan on its public website.

In accordance with EC 1165-2-214, the RMO will identify and assign ATR teams for both the decision document and implementation phases. The RMO develops the charge, or scope of review, for each of the two ATR phases. The RMO also establishes the cost (scalability) of each ATR effort, in coordination with the ATR lead, the RMO establishes approximate time frames for the ATR review.

Additionally, the RMO will ensure that the Walla Walla Cost Engineering Mandatory Center of Expertise (MCX) has reviewed and approved the cost estimate data and information for each rehabilitation project.

3. PROJECT INFORMATION

a. **Project Authorization and Eligibility.** The authorized names and locations of the levee rehabilitation projects are: Russell Allison-Ambraw Levee in Lawrence Illinois; Brevoort Levee Segment in Knox County, Indiana; Wabash Levee Unit # 5 in Gibson and Posey Counties, Indiana and the Gill Township

Levee System in Sullivan County, Indiana. The PIR is a decision document to rehabilitate damages to Flood Control Works that are active in the RIP, pursuant to PL84-99 and the requirements specified in ER 500-1-1 and EP 500-1-1.

Authority for the Levee Rehabilitation Projects for the 2013 Flood Event is contained in the Flood Control and Coastal Emergency Act (Public Law 84-99).

USACE also has authority under PL 84-99, Flood Control and Coastal Emergencies (FCCE) (33 U.S.C. 701n) (69 Stat. 186) for emergency management activities. Under PL 84-99, the Chief of Engineers, acting for the Secretary of the Army, is authorized to undertake activities including disaster preparedness, Advance Measures, emergency operations (Flood Response and Post Flood Response), rehabilitation of flood control works threatened or destroyed by flood, protection or repair of federally authorized shore protective works threatened or damaged by coastal storm, and provisions of emergency water due to drought or contaminated source.

Under the authority of PL 84-99, an eligible flood control works can be rehabilitated if damaged by a flood event. ER 500-1-1, Para 5-6, Active Status, states "Only those FCW in an Active status at the time of the flood or storm event may receive Rehabilitation Assistance under authority of PL 84-99." Per ER 500-1-1, Para 5-11 Cost Share Determination, the flood control works are eligible for rehabilitation in accordance with the cost allocation defined in sub-paragraphs a through h and associated references of the ER and paragraph 5-11. All systems considered eligible for PL 84-99 rehabilitation assistance have to be in the Rehabilitation and Inspection Program (RIP) prior to the flood event. Acceptable operation and maintenance by the public levee sponsor are verified by levee inspections conducted by the Corps on a regular basis.

The Corps has the responsibility to coordinate levee repair issues with interested Federal, State, and local agencies following natural disaster events where flood control works are damaged.

b. Project Descriptions and Levee System Damages.

Beginning on 19 April and extending until 14 May 2013, the Wabash Basin, within the Louisville District (LRL) area of responsibility (AOR) experienced severe flooding. The flooding that occurred over the basin was due to an above normal rain fall received over the area from late winter until early spring of 2013. Furthermore, this rainfall caused four of the Corps operated reservoir projects along the Wabash to exceed 50 percent of their storage capacity, which also taxed the overall system. The flooding caused moderate to extensive damage to many of the flood risk reduction projects that are currently active in the P.L. 84-99 Rehabilitation and Inspection Program (RIP).

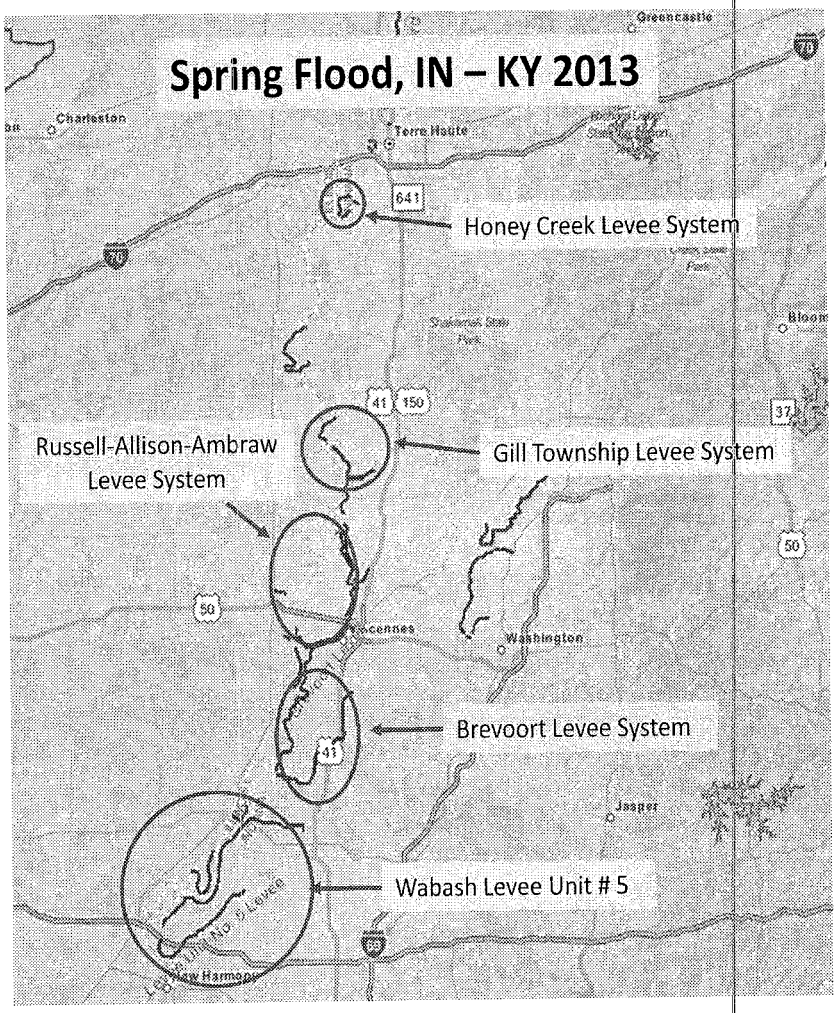

Figure 1 – Locations of Levee Rehabilitation Projects from the Spring Flood IN – KY, 2013

Brevoort Levee System:

Brevoort Levee segment is one of two levees (Vincennes and Brevoort) in the system that reduces the risk of flooding to the City of Vincennes, IN. Brevoort Levee is federally constructed, locally operated and maintained. The project is located in Knox County, Indiana, on the left bank of the Wabash River, 104.5 to 127.5 miles above the mouth, and on the right bank of the White River, 6.3 to 22.2 miles above the mouth. The levee segment consists of 37.1 miles of earthen levee, two pumping stations and 38 drainage structures. The project was constructed in five sections. The approximate lengths of the five sections are as follows: Section I, 16.2 miles; Section II, 5 miles; Section III, 10.1 miles; Section IV, 4.6 miles; Section V, 1.2 miles. The levee area contains approximately 50,000 acres of agricultural land and the small communities of Cathlinette, Zigville, St. Thomas and Brevoort. The Vincennes-Brevoort system levee area contains: an airport, ambulance provider, colleges and universities, schools, correctional facilities, EMS, electrical substations, fire stations, hazmat locations, law enforcement, drinking water and water treatment facilities, oil gas facilities, oil gas pipelines reservoirs, and oil gas wells, with a total value of property in the levee area of $800 million.

Project Damages –

Landside Seepage - Damage resulting from the April 2013 flood event consisted of boils due to under seepage in numerous areas. These boil areas were not in close proximity of the seepage berms recommended by the 2011 Project Information Report (PIR). Design, plans and specifications will need to be developed for this specific location. The largest sandboils reported during the flood fight were along the outside of an oxbow in the Wabash River Section at Stations 129+00, 155+00, 175+00, and 222+00.

River Bank Erosion - As requested by the local sponsor, areas of existing rip-rap were inspected for additional erosion or loss of riprap. There are three (3) locations along the Wabash River Section: Stations 780+00 to 800+00, 625+00 to 650+00, and 552+00 to 566+00. There are four (4) locations along the White River Section: Station 80+00 to 105+00, 115+00 to 140+00, 180+00 to 210+00 and 443+00 to 460+00 where no permanent damage was done.

Gill Township Levee System:

The Gill Township Levee System was federally constructed and is a locally operated and maintained system. The project is located in Sullivan County, Indiana, on the left bank of the Wabash River, 152 to 162 miles above the mouth. Gill Township Levee consists of approximately 13 miles of earthen levee, one roadway closure, two pumping stations and seven drainage structures. The project reduces the risk of flooding to approximately 12,152 acres of agricultural land and the small community of Riverton. The height of the top of the levee is equal to the record flood of 1913 with three feet of freeboard. The levee area contains approximately $7.5 million in property, including an airport, natural gas storage, oil gas pipeline, Reservoir and US Oil Gas Wells (21each) and 72 structures.

Project Damages –

During the April 2013 flood event, the local sponsor observed the presence of three (3) sink holes on riverside of gravity line, Station 134+67, north of Roger's Ditch Pump Station. The Levee Safety Area Representative for this project inspected this area, and concluded that the first hole is directly over the downstream drainage line. The second two holes are approximately 20 feet upstream of both lines; the larger hole is, 8 to10 feet.

Russell-Allison Levee System:

Russell Allison Ambraw Levee District is a system located in Lawrence and Crawford Counties, Illinois, on the right bank of the Wabash River between mile 124.2 and 142.8. The system is Non-Federally constructed, locally operated and maintained. The system consists of 25 miles of earthen levee, three diesel-powered pumping stations and several drainage structures. The system protects approximately 33,000 acres of agricultural land and $64.4 million of property including farm homes, several small businesses, two airports, two hazmat locations, oil gas pipelines, oil gas wells and many miles of improved roadways.

Project Damages –

Embankment Seepage and Sand Boils - From Stations 270+00 to 280+00 and Stations 300+00 to 320+00, damages resulting from the April 2013 flood event consisted of extensive boils on the landside toe of the levee.

Crown Erosion - The April 2013 Flood overtopped the downstream end of Russell-Allison Levee resulting in erosion of the crown, and flood fight efforts extensively rutted the crown between Stations 960+00 and 1070+00 (Beaver Pond Pump Station to Triple Sewers Pump Station).

Levee Embankment Erosion and Failure - At Station 310+00, embankment seepage resulted in backward erosion, the formation of a soil pipe and a direct connection through the embankment to the riverside of the levee. The section of levee embankment in this area has failed, but not breached. A five foot diameter sinkhole/inlet to the soil pipe was observed in the top third of riverside embankment once the flood receded. The landside toe of the levee and embankment experienced four very large boils with throats nearing eight inches in diameter, cones ten feet in width, which piped truck loads of soil despite extensive sandbagging efforts. No deferred maintenance was noted in this area during Continuing Eligibility Inspections (CEI's) since the project was initially eligible for RIP in 1987.

Wabash Levee Unit No. 5:

Wabash Levee Unit 5 extends from the mile 58 to mile 94.5 above the mouth of the Wabash River. The project consists of 41.73 miles of earthen levee with appurtenant drainage structures and two pumping stations. The project reduces the risk of flooding for 44,000 acres of agricultural land and the towns of Lyles, Skelton, and Griffin. The Annual Chance Exceedance (ACE) frequency associated with the top of the levee system is for a flood flow equal to that expected about once in 200-years with a freeboard of one foot. The project reduces the flood risk for $43 million of property including 481 structures, an airport, a dam, five electric generating units, an electric substation, oil and gas facilities, wells and pipelines, as well as three HAZMAT locations.

Project Damages – Landside seepage resulted from the April 2013 flood event and consisted of boils due to under seepage in numerous areas. The most concentrated areas of embankment under seepage and sand boils were between Stations 4120+00 to 4125+00, Stations 4150+00 to 4160+00, and Stations 4245+00 to 4262+00.

4. DISTRICT QUALITY CONTROL (DQC)

All decision documents (including supporting data, analyses, environmental compliance documents, etc.) as well as implementation documents, shall undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manuals of the District and the home MSC.

a. **Documentation of DQC.** DQC of the PIR's and construction plans and specifications and supporting Design Documentation Report (DDR) will be documented by signature sheets of senior-level

checkers, Subject Matter Experts, and Supervisors. The signature sheets will be provided to the ATR team at the start of their review, and will be included in Attachment 2 of this Review Plan.

b. **Products to Undergo DQC.** The PIR's and construction plans and specifications and supporting Design Documentation Report (DDR) will undergo DQC consistent with the District/MSC Quality Management plans and EC 1165-2-214.

c. **Required DQC Expertise.** The required expertise needed to conduct DQC consistent with the District/MSC Quality Management plans are the disciplines of Geotechnical Engineering/Levee Safety, Planning, and Cost Estimating. The Geotechnical Engineer/Levee Safety reviewer must be familiar with methods of remediating levees with seepage and slope stability concerns as well as best practices for repairing embankment erosion damage.

   The Cost Engineering peer reviewer will be a supervisor and/or team leader, designated individuals from the senior staff familiar with the type of work, or other qualified personnel that typically provides a quality check during the development process of the cost estimating product(s).

   The Planning Reviewer should be senior level staff familiar with the ER 1105-2-100 Planning Guidance Notebook and applicable laws, regulations, and policy.

5. AGENCY TECHNICAL REVIEW (ATR)

ATR is mandatory for all decision documents and implementation documents (including supporting data, analyses, environmental compliance documents, etc.). The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. ATR is managed within USACE by the designated RMO and is conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. ATR teams will be comprised of senior USACE personnel and may be supplemented by outside experts as appropriate. The ATR team lead will be selected from outside the home MSC.

a. **Products to Undergo ATR.** The Project Information Reports will undergo ATR (including NEPA and supporting documentation). During the implementation phase, the Plans and Specification and DDR are work products that will undergo ATR.

   In accordance with the CELRD Memorandum dated January 17, 2014, entitled "Agency Technical Review (ATR) Team Composition for PL 84-99 Levee Rehabilitation Projects", ATR team composition for each phase (i.e. Decision and Implementation) are defined on the following pages.

b. **Required ATR Team Expertise.**

   The following table provides descriptions of the various disciplines that might be included on the ATR Team. The RMO is responsible for determining the final makeup of the ATR Team for both the Decision Document and Implementation phases.

ATR Team Members / Disciplines	Expertise Required
ATR Lead and Geotechnical Engineering / Levee Safety	The ATR lead will be a senior professional with extensive experience in preparing Civil Works decision documents and implementation documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline (such as planning, geotechnical, environmental resources, etc). The Geotechnical Engineering/Levee Safety reviewer will be an expert in the field of levee safety and have a thorough understanding of seepage mechanics and means of preventing material loss from the foundation of a levee. The reviewer should be familiar with best practices for levee embankment earthwork, and common repair methods for damage within the levee right of way. The reviewer will have an understanding of slope stability problems commonly associated with levee embankments and river banks and be familiar with common repair techniques.
Civil Engineering	The civil engineer shall be a senior engineer, an expert in the field, and have a thorough understanding of the application of levees and floodwalls. The reviewer shall have experiences in the design and layout of floodwalls and levee structures. The civil engineer shall demonstrate engineering knowledge regarding hydraulic structures, earthwork, utility relocation, erosion control and general site development features. The civil engineer shall be a licensed Professional Engineer.
Structural Engineering	The structural engineer shall be a senior engineer, an expert in the field of structural engineering, and have thorough knowledge of stability analyses and structural design of floodwalls and retaining walls. The structural engineer shall be familiar with applicable and current design software. The structural engineer shall be a licensed Professional Engineer and/or Structural Engineer.
Planning	The Planning reviewer for the Decision Document should be a senior planner with knowledge of the ER 1105-2-100 Planning Guidance Notebook and applicable laws, regulation, and policy.
Cost Engineering	The Cost Engineering reviewer (Decision Document) will be a qualified senior cost engineer with experience in the construction estimating field of study. The reviewer will have extensive knowledge of Civil Works levee projects and have an understanding of Public Law 84-99. The cost engineer will be assigned by the Walla Walla Cost Engineering MCX.
Real Estate	The Real Estate Representative will have experience in plan formulation and implementation of Flood Risk Management (FRM) projects and applicable underlying policies. This member will have familiarity with ER 500-1-1 and specifically LERRDs and A-B-Cs requirements of local sponsors.

c. **Documentation of ATR.** Dr. Checks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments should 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:

i. The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;
ii. The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not be properly followed;
iii. 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
iv. 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 Dr. Checks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, MSC, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution in accordance with the policy issue resolution process described in EC 1165-2-214, ER 1110-1-12 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in Dr. Checks with a notation that the concern has been elevated to the vertical team for resolution.

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 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;
- 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.

ATR may be certified when all ATR concerns are either resolved or referred to the vertical team for resolution and the ATR documentation is complete. The ATR Lead will prepare a Statement of Technical Review certifying that the issues raised by the ATR team have been resolved (or elevated to the vertical team). A Statement of Technical Review must be completed. A sample Statement of Technical Review is included in Attachment 6.

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

IEPR may be required under certain circumstances. 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. A risk-informed decision, as described in EC 1165-2-214, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. There are two types of IEPR:

- Type I IEPR. Type I IEPR reviews are managed outside the USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR will cover the entire decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-214.

- Type II IEPR. Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare.

a. Factors affecting decision on IEPR include:

- Project risks could occur if award of construction contracts and rehabilitation of the levees does not occur in a timely fashion and before the next flood event. The magnitude of this risk could be great if the levees are not returned to their pre-disaster condition, which would leave them in a weakened state as the next flood season approaches. Communities could be left without a sufficient level of flood risk management.

- An assessment from the Louisville District Chief of Engineering and the District Levee Safety Officer regarding whether or not the projects involve a significant threat to human life follows:

  "The projects eligible for PL-84-99 assistance are a variety of projects. These units are eligible for rehabilitation under PL 84-99 law however; Levee Unit #5 and Breevort are mainly agricultural units where there are small populations located behind them. These FCWs were more severely damaged and the structural integrity is threatened. Even

with this severe damage, the threat to significant loss of life is not great since the vast area protected and the depth of inundation occurs in agricultural areas."

- There is no request by the Governor of the affected States for a peer review by independent experts;

- The project is not likely to involve significant public dispute as to the size, nature, or effects of the project. Therefore, there is no known opposition to the levee rehabilitation;

- The project is not likely to involve public dispute as to the economic or environmental cost or benefit of the project. Therefore, there is no known opposition to the levee rehabilitation;

- The recommended repair alternatives for the rehabilitation of the levees are all standard practice and are being recommended to return the levees to their pre-flood condition. The models, methodology and approach of the levee rehabilitation Project Information Reports do not deviate from the standards of Flood Risk Management, nor do they present any extraordinary challenges. An Environmental Assessment may not be required for each of the levee rehabilitation projects. Some of the projects fall under the realm of a categorical exclusion. All environmental requirements will be met. The Project Information Reports are unlikely to possess significant interagency interest, and do not involve any significant threats to human life or safety assurance issues. The consequences of project non-performance, with and without the project, are similar because it is a rehabilitation project. It is not likely that the project will have significant economic, environmental, or social effects to the nation, such as, but not limited to, more than negligible adverse impacts on scarce or unique cultural, historic, or tribal resources; substantial impacts on fish and wildlife species or their habitat, prior to implementation of mitigation; more than negligible adverse impact on species listed as endangered or threatened, or to the designated critical habitat of such species, under the Endangered Species Act, prior to implementation of mitigation. Rehabilitation of these projects has been authorized under Public Law 84-99. It is not expected that implementation costs will exceed the $45 million threshold for IEPR requirement.

- The repairs indicated in the project information reports do not require redundancy, resiliency, and/ or robustness, unique construction sequencing, or a reduced or overlapping design construction schedule. The repairs do not provide any redundant features because they restore the levee to pre-flood condition. Placement of riprap, sand berms, erosion control mats, and gravel on the levee embankment prevent future damage to the levee embankment. The repairs are necessary to reduce the risk of failure from damages caused by the 2013 flood and do not provide the levee systems with any additional capabilities beyond typical operation.

b. Decision on IEPR. Any project, including the Levee Rehabilitation Projects, can have residual risks and public safety concerns that are significant during the occurrence of flood events exceeding the capacity of the levee system. The following paragraphs describe the issues associated with potential overtopping and discuss specifically how those risks are being addressed for the levee rehabilitation projects.

For overtopping events, there is the potential for impact on floodplain residents, businesses, transportation systems, and other critical infrastructure systems. However, the damage incurred in the 2013 Flood Event is not significant enough to seriously impact the overall performance of the levee system. The levee systems are eligible for rehabilitation under PL 84-99. Wabash Levee Unit #5 and Breevort are mainly agricultural units but there are small populations located behind them. These structures were more severely damaged and the structural integrity is greatly impacted. Even with this severe damage, the threat to significant loss of life is not great given the vast area protected and the depth of inundation.

Since the scope of the levee rehabilitation is limited in that the levees are being returned to their pre-flood condition, and since they don't meet any of the mandatory trigger criteria for Type I IEPR or Type II IEPR, Type I or Type II IEPR is not recommended for these PL 84-99 projects.

c. Products to Undergo Type I IEPR. Not-Applicable.

d. Required Type I IEPR Panel Expertise. Not-Applicable.

e. Documentation of Type I IEPR. Not-Applicable.

7. POLICY AND LEGAL COMPLIANCE REVIEW

All decision documents and implementation documents will be reviewed for their compliance with law and policy. Guidance for policy and legal compliance reviews is addressed in Appendix H, ER 1105-2-100. These reviews culminate in 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 home MSC Commander. DQC and ATR augment and complement the policy review processes by addressing compliance with pertinent published Army policies, particularly policies on analytical methods and the presentation of findings in decision documents.

8. COST ENGINEERING MANDATORY CENTER OF EXPERTISE (MCX)

All decision documents shall be coordinated with the Cost Engineering MCX, located in Walla Walla District. The MCX will assist in determining the expertise needed on the ATR Team and in the development of the review charge(s). The RMO and ATR lead are responsible for coordination with the Cost Engineering MCX.

Due to conflicts with current cost regulations, a certification of cost cannot be provided by the Walla Walla Cost MCX. As such, a flat 10% contingency will be applied that is not risk based.

9. MODEL CERTIFICATION AND APPROVAL

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate,

and based on reasonable assumptions. Planning models, for the purposes of the EC, are defined as any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making. The use of a certified/approved planning model does not constitute technical review of the planning product. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed. As part of the USACE Scientific and Engineering Technology (SET) Initiative, many engineering models have been identified as preferred or acceptable for use on Corps studies and these models should be used whenever appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

a. Planning Models. The LRL Levee PIR Economic Worksheet was developed in the Louisville District and has served as the only model utilized for economic analysis associated with LRL Levee PIR studies. This worksheet was designed to meet all requirements established in EP 500-1-1, Appendix D – Economic Analysis. With this worksheet, expected annual damages are manually calculated by computing the area under the damage-frequency curve. This manual computation is required by the LRL economist as curves typically produced by H&H for FRM studies (stage-discharge and discharge-frequency) are not produced for Levee PIR studies, thus prohibiting utilization of HEC-FDA 1.2.4. Expected annual damages are calculated for both the existing and with-project conditions and annual benefits for various plans are derived by calculating the difference between the two. The benefits for each alternative studied are then measured against the respective cost for each alternative in a cost-benefit analysis. This analysis yields a net benefit determination and a benefit-to-cost ratio for each alternative. A B/C greater than 1 is required to assure federal interest, but the alternative that yields highest net benefits is not the criteria for selection of a rehab alternative. Selection criteria is the least federal cost, technically acceptable alternative to restore project to pre-flood level of protection.

b. Engineering Models. The following engineering models are anticipated to be used in the development of the decision document:

Software Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Approval Status
Micro-Computer Aided Cost Estimating System (MCACES), Second Generation (MII), Version 4.1	MII provides an integrated costs estimating system that meets the USACE requirements for preparing cost estimates. MCACES was used to produce estimates and was reported by using Microsoft Excel.	Required per ETL 1110-2-573

10. REVIEW SCHEDULES AND COSTS

a. DQC & ATR Schedules and Cost.

Decision Document Phase (PIRs). DQC and ATR review durations and costs will generally be the same for each of the 2013 PL 84-99 projects. The ATR team for the Decision Document Phase will include the ATR Lead/Geotechnical Engineer and a Cost Engineer assigned by the Walla Walla Cost Engineering Mandatory Center of Expertise (MCX). The ATR review process for this phase includes: 1) initial comments; 2) PDT response per discipline; and 3) backcheck by each respective reviewer. See the table below for approximate review durations and estimated ATR costs, per person, per PIR.

Decision Document Phase		
Review Item Per PIR	Approx. Review Duration (Days)	Estimated Cost Per Person
DQC (each discipline)	3	$3,000
ATR Lead (initial comments)	5	$2,500
Cost Engineer (initial comments)	5	$5000*
PDT Response (per discipline)	2	$2,500
ATR Lead Backcheck	2	included above
Cost Engineer Backcheck	2	included above
* Amount could drop if Walla Walla Cost MCX performs review totally in-house		

Implementation Phase (DDR and P&Ss). DQC and ATR review durations and costs will generally be the same for each of the 2013 PL 84-99 projects – with the exception of Gill Township Levee System which will include a Structural Engineer. ATR for all projects will include the ATR Lead/Geotechnical Engineer, a Real Estate ATR team member, and a Civil Engineer ATR team member. The ATR review process for this phase includes: 1) initial comments; 2) PDT response per discipline; and 3) backcheck by each respective reviewer. See the table below for approximate review durations and estimated ATR costs, per person, per project.

Implementation Phase		
Review Item Per Project PED	Approx. Review Duration (Days)	Estimated Cost Per Person
DQC (each discipline)	3	$3,000
ATR Lead (initial comments)	5	$2,500
Civil Engineer (initial comments)	5	$2,500
Real Estate (initial comments)	3	$2,000
Structural* (initial comments)	3	$2,500
PDT Response (per discipline)	2	$2,000
ATR Lead Backcheck	2	$2,500
Civil Engineer Backcheck	2	$2,000
Real Estate Backcheck	2	$2,000
Structural* Backcheck	2	$2,000
* Only for Gill Township Levee System		

Documents for each of the above two Phases may be conducted concurrently if documents for projects are available at the same time. In order to meet the ATR review durations, ATR responsibility may become shared (i.e., another member added to help expedite the review/backcheck process). The review durations and associated costs assume that there are no significant disagreement(s) between the District and ATR team. The review durations and associated costs also assume that no major quality issues exist with either the PIRs or the DDR/P&Ss. All comments will be included in DrChecks.

b. Type I IEPR Schedule and Cost. Not Applicable given the nature of repairs is to just re-establish the impacted areas of the levee to pre flood conditions.

c. Model Certification/Approval Schedule and Cost. Planning models have not been used in the development of the Project Information Reports. The LRL Levee PIR Economic Worksheet was developed in the Louisville District and has served as the only model utilized for economic analysis associated with LRL Levee PIR studies. This worksheet was designed to meet all requirements established in EP 500-1-1, Appendix D – Economic Analysis. With this worksheet, expected annual damages are manually calculated by computing the area under the damage-frequency curve. This manual computation is required by the LRL economist as curves typically produced by H&H for FRM studies (stage-discharge and discharge-frequency) are not produced for Levee PIR studies, thus prohibiting utilization of HEC-FDA 1.2.4. Expected annual damages are calculated for both the existing and with-project conditions and annual benefits for various plans are derived by calculating the difference between the two. The benefits for each alternative studied are then measured against the respective cost for each alternative in a cost-benefit analysis. This analysis yields a net benefit determination and a benefit-to-cost ratio for each alternative.

11. PUBLIC PARTICIPATION

The final Project Information Reports and plans and specifications will also be made available to the public on the Louisville District website.

12. REVIEW PLAN APPROVAL AND UPDATES

The Great Lakes and Ohio River Division Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving district, MSC, and HQUSACE members) as to the appropriate scope and level of review for the Project Information Reports. Like the PMP, the Review Plan is a living document and may change. The home district is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the MSC Commander's initial approval of the review plan are documented in Attachment 7. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-approved by the MSC Commander following the process used for initially approving the plan. Significant changes to the review plan are also documented in Attachment 7. The latest version of the Review Plan, along with the Commanders' approval memorandum, must be posted on the Home District's webpage. The latest Review Plan must also be provided to the MSC.

13. REVIEW PLAN POINTS OF CONTACT

Public questions and/or comments in reference to this review plan can be directed to the following points of contact:

- Louisville District Program Manager, Charles Oliver, EM – 502-315-6921

14. VALUE ENGINEERING

Value Engineering is required for Federal projects in excess of $2,000,000.00 total cost pursuant with Memorandum for Record, December 2012, SUBJECT: Updated Legal and Regulatory Requirements for Value Engineering on Corps of Engineers Projects (Para. 2.h.), as follows:

> "The current version of the ER provides that OMB Circular A-131 *requires* VE studies in all federal projects /programs over $1M in total cost. This provision is no longer supported by the Circular. Instead, the Circular A-131 now holds that VE is required for agency project and programs at or above $2M."

Projects with an estimate cost in excess of $2,000,000.00 shall execute a VE study at the beginning of the implementation phase. For projects exceeding $10 million, no wavier from VE requirements shall be granted.

ATTACHMENT 1: FLOOD RESPONSE LEVEE REHABILITATION TEAM

Spring 2013 Flood Response Levee Rehabilitation Assistance Team			
Area	**Name**	**Office Symbol**	**Telephone**
Emergency Management	Minges, George	OP-E	502-315-6933
Economics	Lutz, Nicholas	PM-P	502-315-6874
Environmental/ Cultural Resources	Helton, Jesse	PM-P	502-315-6795
Engineering and Design	Jeffries, Ryan	ED-T-G	502-315-6439
Levee Safety Program Manager	Frank, Daniel	ED-T-G	502-315-6291
Engineering and Design	Twombly, John	ED-T-G	502-315-6301
GIS	LaDue, Denise	OP-E	502-315-6926
Construction	Comer, Carl D (Doug)	CD-T-Q	502-315-6125
Hydraulics and Hydrology	Philips, Mark	ED-T-H	502-315-6470
Real Estate	Meyer, Jason	RE-C	502-315-6956
Cost Engineering	Tabor, Justin	ED-M-C	502-315-2621
Funding Support	Reading, Marilyn	OP-E	502-315-6923
P2 Schedules and Resourcing	Squire, Careka	PM-R&C	502-315-6804
Office of Counsel	Williamson, George	OC	502-315-6658

ATTACHMENT 2: FLOOD RESPONSE LEVEE DISTRICT QUALITY CONTROL TEAM

Spring 2013 Flood Response Levee District Quality Control Team			
Area	**Name**	**Office Symbol**	**Telephone**
Emergency Management	Oliver, Charles	OP-E	502-315-6921
Project Management	Walker, Donald	OP-E	502-315-6920
Economics	Ryan, Alex	PM-P	502-315-6866
Environmental/ Cultural Resources	Turner, William	PM-P	502-315-6900
Engineering and Design	Allison, John	ED-T	502-315-6350
Engineering and Design, Geotech SME	Neutz, Christina	ED-T-G	502-315-6305
Construction	Sweeney, Karen	CD-T-Q	502-315-7453
Real Estate	Smith, Patty	RE-C	502-315-7017
Cost Engineering	Canfield, Stephen	ED-M-C	502-315-6268
Office of Counsel	Lengel, Janice	OC	502-315-6641

ATTACHMENT 3: AGENCY TECHNICAL REVIEW (ATR) TEAM PIR'S

Agency Technical Review (ATR) Team for PIR- Brevoort Levee System			
Area	**Name**	**Office Symbol**	**Telephone**
Agency Technical Review Team Lead & Geotechnical Engineer	Bellew, Glen	CENWK-ED-GD	816-389-3553
Cost Engineer	Smith, Gary	CENWW-EC-X	651-260-1819

Agency Technical Review (ATR) Team for PIR- Gill Township Levee System			
Area	**Name**	**Office Symbol**	**Telephone**
Agency Technical Review Team Lead & Geotechnical Engineer	Bellew, Glen	CENWK-ED-GD	816-389-3553
Cost Engineer	Smith, Gary	CENWW-EC-X	651-260-1819

Agency Technical Review (ATR) Team for PIR- Russell Allison Levee System			
Area	**Name**	**Office Symbol**	**Telephone**
Agency Technical Review Team Lead & Geotechnical Engineer	Bellew, Glen	CENWK-ED-GD	816-389-3553
Cost Engineer	Smith, Gary	CENWW-EC-X	651-260-1819

Agency Technical Review (ATR) Team for PIR- Wabash Levee Unit No. 5			
Area	**Name**	**Office Symbol**	**Telephone**
Agency Technical Review Team Lead & Geotechnical Engineer	Bellew, Glen	CENWK-ED-GD	816-389-3553
Cost Engineer	Smith, Gary	CENWW-EC-X	651-260-1819

ATTACHMENT 4: AGENCY TECHNICAL REVIEW (ATR) TEAM FOR PLANS & SPECIFICATIONS, DDR and REAL ESTATE

ATR Team for P&S, DDR and RE - Brevoort Levee System			
Area	**Name**	**Office Symbol**	**Telephone**
Agency Technical Review Team Lead & Geotechnical Engineer	Bellew, Glen	CENWK-ED-GD	816-389-3553
Civil Engineer	Jansen, Ronald	CENWK-ED-GC	816-389-3610
Real Estate	Vance, Karen	CEMVK-RE-E	504-862-1349

ATR Team for P&S, DDR and RE - Gill Township Levee System			
Area	**Name**	**Office Symbol**	**Telephone**
Agency Technical Review Team Lead & Geotechnical Engineer	Bellew, Glen	CENWK-ED-GD	816-389-3553
Civil Engineer	Jansen, Ronald	CENWK-ED-GC	816-389-3610
Real Estate	Buatte, Carla	CEMVK-RE-A	504-862-1605
Structural Engineer	Muller, Paul	CENWK-ED-DS	816-389-3614

ATR Team for P&S, DDR and RE - Russell-Allison Levee System			
Area	**Name**	**Office Symbol**	**Telephone**
Agency Technical Review Team Lead & Geotechnical Engineer	Bellew, Glen	CENWK-ED-GD	816-389-3553
Civil Engineer	Jansen, Ronald	CENWK-ED-GC	816-389-3610
Real Estate	Clark, Erin	CEMVK-RE-E	504-862-2183

ATR Team for P&S, DDR and RE - Wabash Levee Unit No. 5			
Area	**Name**	**Office Symbol**	**Telephone**
Agency Technical Review Team Lead & Geotechnical Engineer	Bellew, Glen	CENWK-ED-GD	816-389-3553
Civil Engineer	Jansen, Ronald	CENWK-ED-GC	816-389-3610
Real Estate	Vance, Karen	CEMVK-RE-E	504-862-1349

ATTACHMENT 5: AGENCY TECHNICAL REVIEW DOCUMENTS

Final Certification Date	Name of Document	Location

ATTACHMENT 6:

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the [product type & short description of item] for [project name and location]. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-214. During the ATR, 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 results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrChecks[sm].

SIGNATURE _____ _____
[Name] Date
ATR Team Leader
[Office Symbol or Name of AE Firm]

SIGNATURE _____ _____
[Name] Date
Project Manager (home district)
[Office Symbol]

SIGNATURE _____ _____
[Name] Date
Architect Engineer Project Manager [1]
[Company, location]

SIGNATURE _____ _____
[Name] Date
Review Management Office Representative
[Office Symbol]

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows:
[Describe the major technical concerns and their resolution and specifically list any agreed-upon deferrals to be completed in the next phase of work.]

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

SIGNATURE _____ _____
[Name] Date
Chief, Engineering Division (home district)
[Office Symbol]

SIGNATURE _____ _____
[Name] Date
Chief, Planning Division[2] (home district)
[Office Symbol]

Add appropriate additional signatures (Operations, Construction, AE principal for ATR solely conducted by AE, etc) and/or modify to accommodate local organizational structure.

1 Only needed if some portion of the ATR was contracted 2Decision Documents Only.

Attachment 6 Instructions: [Input] – Information in Blue brackets and text is required. Once the input is provided, text should be formatted in black and the brackets should be deleted. Delete these instructions in the completed form.

ATTACHMENT 7: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number
Initial Review Plan	None	

ATTACHMENT 8: ACRONYMS AND ABBREVIATIONS

Term	Definition	Term	Definition
ATR	Agency Technical Review	NIMS	National Incident Management System
DQC	District Quality Control/Quality Assurance	PCX	Planning Center of Expertise
DX	Directory of Expertise	PDT	Project Delivery Team
EA	Environmental Assessment	PMP	Project Management Plan
EC	Engineer Circular	PL	Public Law
FRM	Flood Risk Management	QMP	Quality Management Plan
Home District/MSC	The District or MSC responsible for the preparation of the decision document and implementation documents	QA	Quality Assurance
HQUSACE	Headquarters, U.S. Army Corps of Engineers	QC	Quality Control
IEPR	Independent External Peer Review	RMC	Risk Management Center
ICS	Incident Command System	RMO	Review Management Organization
MSC	Major Subordinate Command	SAR	Safety Assurance Review
NEPA	National Environmental Policy Act	USACE	U.S. Army Corps of Engineers