

REVIEW PLAN
for
MARLINTON, WEST VIRGINIA
LOCAL PROTECTION PROJECT
GREENBRIER RIVER,
POCAHONTAS COUNTY
Design and Construction Activities
Huntington District

January 2011



**US Army Corps
of Engineers**®

REVIEW PLAN

MARLINTON, WEST VIRGINIA LOCAL PROTECTION PROJECT Design and Construction Activities

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1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope and level of peer review for the design and construction activities of the Marlinton, West Virginia Local Protection Project.

b. References

- (1) Engineer Circular (EC) 1165-2-209, Civil Works Review Policy, 31 January 2010
- (2) Engineer Regulation (ER) 1110-1-12, Quality Management, 31 July 2006
- (3) Marlinton, West Virginia Local Protection Project, Project Management Plan

c. **Requirements.** This review plan was developed in accordance with EC 1165-2-209, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and Operation, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R). It provides the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision, implementation, and operations and maintenance documents and work products. The EC outlines three levels of review: District Quality Control, Agency Technical Review, and Independent External Peer Review.

- (1) District Quality Control (DQC). DQC is 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). Basic quality control tools include a Quality Management Plan providing for seamless review, quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc. It is managed in the home district. Quality checks may be performed by staff responsible for the work, such as supervisors, work leaders, team leaders, designated individuals from the senior staff, or other qualified personnel. However, they should not be performed by the same people who performed the original work, including managing/reviewing the work in the case of contracted efforts. Additionally, the PDT is responsible for a complete reading of any reports and accompanying appendices prepared by or for the PDT to assure the overall coherence and integrity of the report, technical appendices, and the recommendations before approval by the District Commander.. The Major Subordinate Command (MSC)/District Quality Management Plans address the conduct and documentation of this fundamental level of review. DQC is not addressed further in this review plan.
- (2) Agency Technical Review (ATR). ATR is an in-depth review, managed within USACE, and conducted by a qualified team outside of the home district that is not involved in the day-to-day production of the project/product. The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. The ATR team reviews the various work products and assure that all the parts fit together in a coherent whole. ATR teams will be comprised of senior USACE personnel, preferably recognized subject matter experts with the appropriate technical expertise such as regional technical specialists (RTS), 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.
- (3) Independent External Peer Review (IEPR). IEPR is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is

warranted. For clarity, IEPR is divided into two types, Type I is generally for decision documents and Type II is generally for implementation documents.

A Type II IEPR (SAR) shall be conducted on design and construction activities for hurricane and storm risk management and flood risk management projects, as well as other projects where potential hazards pose a significant threat to human life. This applies to new projects and to the major repair, rehabilitation, replacement, or modification of existing facilities. External panels will review the design and construction activities prior to initiation of physical construction and periodically thereafter until construction activities are completed. The review shall be on a regular schedule sufficient to inform the Chief of Engineers on the adequacy, appropriateness, and acceptability of the design and construction activities for the purpose of assuring that good science, sound engineering, and public health, safety, and welfare are the most important factors that determine a project's fate.

2. PROJECT INFORMATION

- a. **Project.** Section 579 of WRDA 1996 authorized a comprehensive flood control initiative for the Greenbrier Basin. A Limited Evaluation Report (LER) completed in December 1997 examined both structural and non-structural alternatives for each of the three major damage centers – Marlinton (Pocahontas County), Ronceverte (Greenbrier County), and Alderson (Greenbrier and Monroe Counties) at a reconnaissance level. The FY 99 Appropriations Bill included funds to initiate preparation of a Detailed Project Report (DPR) and detailed design for a flood control project for Marlinton. Appropriated funds to date under Section 579, the Greenbrier River Basin authority, were used to complete the integrated Detailed Project Report and Environmental Impact Statement (DPR/EIS) for the Marlinton element of the Greenbrier Basin initiative. There are two amendments to the original authorization that increase the authorized Federal appropriations limit. The current limit was set in the 2007 WRDA. The FY 08 Senate version of the Appropriation language also directed the Corps to sign the Project Partnership Agreement (PPA) and construct the first two phases of the project. The Marlinton DPR/EIS integrated document evaluated an array of alternatives to lessen the risk of flooding to the Town of Marlinton including floodwall, levees, small impoundments, channel alteration, flow diversion and non-structural measures. None of the alternatives formulated provided positive net benefits, therefore, the least cost plan that meets the stated planning objectives and intent of the authorizing legislation is considered the recommended plan. The recommended plan is a combination levee/floodwall system that provides flood risk management to the Town of Marlinton for both the east and west sides of the Greenbrier River (also referred to as the Downtown and Riverside sections).
- b. **General Site Location and Description.** The Greenbrier River Basin is located in eastern West Virginia. The Greenbrier River flows 167 miles through the counties of Pocahontas, Greenbrier, Monroe, and Summers. The basin has a drainage area of 1,641 square miles. The town of Marlinton is located along the Greenbrier River, 109 miles upstream from its confluence with the New River. The project area includes approximately 4 miles of the Greenbrier River, the lower mile of Knapps Creek, and along Stony Creek downstream of the community of Campbelltown. Marlinton is served by WV Route 39 (WV 39) and US Route 219. The tributaries of Stony Creek (23 sq. mi. drainage area) and Knapps Creek (134 sq. mi. drainage area) both enter the Greenbrier River within the project area. The drainage area for the Greenbrier River at Marlinton is approximately 518 square miles.

Phase 1 of construction will be the Resident Engineer's Office, which will be located at the northernmost end of the project within the community of Riverside on one tract of land. This is undeveloped property that is bound by US Route 219 to the west, Stony Creek to the north and east, and a business establishment (Glades Building Supply) to the south. The plans and specifications for

the Resident Engineer's Office were prepared in-house in anticipation that the construction would be completed by an IDIQ contractor. The P&S were reviewed by an Independent Technical Review team and were completed in November 2004.

Phase 2 of the project is in the community of Riverside, which is upstream of Marlinton yet within its town limits. Riverside is located on the west bank of the Greenbrier River, and it is the more commercial section of town. The Riverside area is experiencing continual land development in the form of retail stores, banks, and other business establishments. The Phase 2 design consists of levee and floodwall structures and operates in conjunction with Phase 3 to protect the community of Riverside and the Town of Marlinton. The A-E firm Burgess & Niple, Inc., has been retained by the Government to prepare the Design Documentation Report (DDR) as well as Plans and Specifications for Phase 2. The Phase 2 DDR was completed June 2005; the Plans and Specifications will be complete in 2010.

Phase 3 of the project { XE "selected plan" } consists of levee and floodwall{ XE "floodwall" } structures that will protect downtown Marlinton. Many residential and municipal structures including the town hall, fire department, and elementary school are within the line of protection on Phase 3. The Design Documentation Report (DDR) was completed March 2007, and the development of Plans and Specifications has been initiated.

- c. **Factors Affecting the Scope and Level of Review.** This study is not expected to contain influential scientific information nor be a highly influential scientific assessment. This study area is not highly urbanized, not controversial and does not have significant agency and public interest. However, due to the mandated level of protection (350-year event) and the mountainous region, project features are sizeable and the cost estimate is \$165 M for construction of the nearly three and a half miles of floodwall and associated interior drainage features.
- d. **Recommended Plan.** Phase 1 of design includes features for the Resident Engineer's Office to be used during construction of the entire local protection project. The building itself will be a 36' x 100' stick-built structure on a concrete slab. The structure will serve both office and laboratory materials testing purposes. Electrical and mechanical designs (i.e., HVAC, plumbing) are included.

Flood protection for Riverside (Phase 2) will consist of earthen levee, concrete T-wall, two gate closures and a stormwater pump station. Flood protection features will be constructed along the right descending bank of Stony Creek just upstream of US Route 219, continuing to the confluence of Stony Creek and the Greenbrier River. It then extends downstream along the right descending bank of the Greenbrier River to US Route 219 where it ties into high ground.

The Phase 3 design consists of levee and floodwall structures that will reduce flood damages in downtown Marlinton. Project features include earthen levee, concrete T-Wall, four gate closures, and two stormwater pump stations. The line of protection begins at high ground at the upper end of town, east of the Greenbrier River Trail. From there it extends 250 feet to the Greenbrier River at Tannery Row and extends 5,610 feet along the Greenbrier River to the confluence with Knapps Creek. Protection continues 4,400 feet along the creek, ending at high ground near Wilson's Field.

- e. **In-Kind Contributions.** The Non Federal Cost Share Sponsor for this project is the Town of Marlinton, WV. There are no in kind services anticipated as part of the cost share.

3. RMO COORDINATION

The review management organization will be the USACE Risk Management Center (RMC).

4. DISTRICT QUALITY CONTRL (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). Basic quality control tools include a Quality Management Plan providing for seamless review, quality checks and reviews, supervisory reviews, and Project Delivery Team (PDT) reviews throughout the life of the project. DQC efforts will include the necessary expertise to address compliance with published Corps policy.

5. AGENCY TECHNICAL REVIEW (ATR)

- a. **General.** ATR will be managed and performed outside of the Huntington District. EC 1165-2-209 requires the USACE Risk Management Center (RMC) to serve as the RMO for flood and storm damage reduction projects. At this time the RMC isn't staffed or organized to support ATR. In the interim, the Great Lakes & Ohio River Division will manage the ATR. There shall be appropriate coordination and processing through CoPs; relevant PCXs, and other relevant offices to ensure that a review team with appropriate independence and expertise is assembled and a cohesive and comprehensive review is accomplished. The ATR shall ensure that the product is consistent 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 the results in a reasonably clear manner for the public and decision makers. Members of the ATR team will be from outside the Huntington District with exception of the Environmental reviewer. The ATR lead will be from outside the Great Lakes & Ohio River Division.
- b. **Products for Review.** The ATR team will be reviewing the 100% Design Documentation Report Update and the Plans & Specifications.
- c. **Required ATR Team Expertise.** ATR teams will comprise senior USACE personnel (Regional Technical Specialists (RTS), etc.), and may be supplemented by outside experts as appropriate. The disciplines represented on the ATR team will reflect the significant disciplines involved in the planning, engineering, design, and construction effort. These disciplines include civil/relocations, geotechnical, geology, structural, mechanical, electrical, hydraulics and hydrology, and cost engineering. To assure independence, the leader of the ATR team (Kent Hokens, CEMVP) is outside of the Great Lakes and Ohio River Division (LRD). A list of the ATR members and disciplines is provided in ATTACHMENT 1. The chief criterion for being a member of the ATR team is knowledge of the technical discipline and relevant experience.
- d. **Documentation of ATR.** DrChecks 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:
 - (1) The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;
 - (2) The basis for the concern – cite the appropriate law, ASA (CW)/USACE policy, guidance or procedure that has not been properly followed;
 - (3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and

- (4) The probable specific action needed to resolve the concern – identify the action(s) that 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 DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical coordination, and lastly the agreed upon resolution. The ATR team will prepare a Review Report which includes a summary of each unresolved issue; each unresolved issue will be raised to the vertical team for resolution. Review Reports will be considered an integral part of the ATR documentation.

ATR may be certified when all ATR concerns are either resolved or referred to HQUSACE for resolution and the ATR documentation is complete. Certification of ATR should be completed, based on work reviewed to date, for the draft and final report. See ATTACHMENT 2.

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

- a. General.** Type I and Type II IEPRs are conducted in accordance with the guidance promulgated in EC 1165-2-209. Type I IEPRs are conducted on project studies. It is of critical importance for those decision documents and supporting work products where there are public safety concerns, significant controversy, a high level of complexity, or significant economic, environmental and social effects to the nation. However, it is not limited to only those cases and most studies should undergo Type I IEPR. In accordance with EC 1165-2-209 a Type II IEPR (SAR) shall be conducted on design and construction activities for hurricane and storm risk management and flood risk management projects, as well as other projects where potential hazards pose a significant threat to human life. This applies to new projects and to the major repair, rehabilitation, replacement, or modification of existing facilities. WRDA 2007, Section 2035, Safety Assurance Review, requires a review of the design and construction activities prior to initiation of physical construction and periodically thereafter until construction activities are completed. This review will be on a regular schedule sufficient to inform the Chief of Engineers on the adequacy, appropriateness, and acceptability of the design and construction activities for the purpose of assuring public health, safety and welfare. SARs will be conducted during the Design Documentation Report (DDR) phase, the Plans and Specifications (P&S) phase and intermittently throughout the construction phase of Phases 2 and 3. The purpose of the SAR is to ensure that good science, sound engineering, and public health, safety and welfare are the most important factors that determine a project's fate. The SAR shall focus on whether the assumptions made for hazards remain valid as additional knowledge is gained and the state-of-the-art evolves. Additionally, the SAR team shall advise whether project features adequately address redundancy, robustness, and resiliency; and findings during construction reflect the assumptions made during design.
- b. Decision on Type II IEPR.** In accordance with EC 1165-2-209 a Type II IEPR (SAR) shall be conducted on design and construction activities for flood risk management projects. This applies to new projects and to the major repair, rehabilitation, replacement, or modification of existing facilities.
- c. Products for Review.** Type II IEPR will be performed on the 100% Design Documentation Report (DDR); 90% Plans & Specifications, during the midpoint of the construction, and before substantial completion of construction.
- d. IEPR Review Team.** SAR Type II IEPR Review Team will be established, in consultation with the RMC, through a Louisville District contract with contract capacity transferred to the Huntington District. The public, scientific or professional societies will not be asked to nominate potential

reviewers. The Review Team will be selected based on their technical qualifications and experience. The Review Team should be independent of USACE and free of conflicts of interests. The Review Team will be able to evaluate whether the interpretation of analysis and conclusions based on analysis are reasonable. The Review Team will be given the flexibility to bring important issues to the attention of decision makers. However, the Review Team will 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. The Review Team may, however, offer their opinion as to whether there are sufficient analyses upon which to base a recommendation. The Review Team will have experience in design and construction of projects similar in scope to the Marlinton, WV Local Protection Project. The Review Team shall be registered professional engineers in the United States, or similarly credentialed in their home country. The Review Team must also have an engineering degree. A Master's degree in engineering is preferable, but not required, as hands-on relevant engineering experience in the listed disciplines is more important. The Review Team shall have a minimum of 15 years experience and responsible charge of engineering work. See ATTACHMENT 1 for the required experience in the required disciplines.

- e. **Documentation of IEPR.** Dr Checks 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 key parts as described for ATR comments in Section 3. The Contractor (Battelle) 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 prepared by the Contractor (Battelle);
- 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.

- f. **Decision on Type I IEPR.** The current Review Plan addresses the design and construction activities for the Marlinton LPP. A Type I IEPR has been completed. The Type I IEPR was managed by an Outside Eligible Organization (OEO), Battelle, through a contract administered by the Army Research Organization (ARO) using the National Academies of Science (NAS) policy for selecting reviewers. The Marlinton DPR Review Plan is dated 25 February 2009 and was approved by CELRD-PDS-P memorandum dated 13 May 2009. See attachment #3.

7. REVIEW SCHEDULES AND COSTS

- a. **DQC Schedule and Cost.** The cost for DQC is included in the costs for PDT activities and is not broken out separately. DQC will occur seamless during throughout the DDR and the P&S. Quality checks and reviews occur during the development process and are carried out as a routine management practice. PDT Review of the Phase 3 DDR and 70% P&S are scheduled to begin 1 April 2011 and be complete by 28 April 2011 including resolution of all comments. PDT review of the 90% P&S will take place in FY2011. PDT Review for Phase 2 products is complete.
- b. **ATR Schedule and Cost.** The estimated cost for Phase 3 ATR is \$80,000. ATR will occur during key stages in the DDR and the P&S. The ATR team is invited to take part in weekly team meetings

and monthly vertical team meetings. ATR of the Phase 3 DDR and P&S is scheduled to begin 1 April 2011 and be complete by 28 April 2011, including resolution of all comments. ATR of Phase 2 products is complete. Face-to-Face comment resolution meetings will be scheduled with the ATR team, if required.

Phase 2 ATR Milestones	
50% DDR Review	Complete
70% Plans Review	Complete
100% P&S Review	Complete

Phase 3 ATR Milestones	
50% DDR Review	Complete
100% DDR Update Review	TBD
70% Plans Review	TBD
100% P&S Review	TBD

- c. **IEPR Schedule and Cost.** The estimated cost for Type II IEPR (SAR), including the cost for the RMO to administer and manage the review, is in the range of \$300,000 to \$400,000. IEPR of the DDR Update, P&S, and during the construction phase (including site visits) have not been scheduled at this time. Face-to-Face comment resolution meetings will be scheduled with the IEPR team.

Phase 2 IEPR (SAR) Milestones	
100% DDR and P&S Review	TBD
Construction Midpoint	TBD

Phase 3 IEPR (SAR) Milestones	
100% DDR Update Review	TBD
90% P&S Review	TBD
Construction Midpoint	TBD

8. PUBLIC PARTICIPATION

As part of the peer review, opportunities were and will continue to be provided for the public to comment on the study and decision documents that are to be reviewed. Significant and relevant public comments were provided to the reviewers before they conducted their review. The Huntington District made the draft Marlinton DPR/EIS document available to the public for comment (November – December 01) and sponsored several public meetings and workshops. The peer reviewers were provided the formal public comments in the final draft document. Several NEPA public scoping meetings were held presenting information at various stages during the feasibility study to receive input from the public. Information obtained during public meetings was used to assist in plan formulation and to complete the draft environmental documents necessary to meet both Federal and State requirements. This includes State and Federal agency reviews as well. Additional public meetings will be conducted, as necessary, through the DDR, plans and specifications and construction phases. Information will also be conveyed to the public through the use of press releases and media interviews as necessary and through the use of posting information to the Huntington District’s web site. The project manager will also schedule office hours at

the project site after construction is initiated. There is no formal public review for the DDR, plans and specifications and construction phases. However, the cost share partner, the Town of Marlinton, WV, will have opportunities to review the DDR, plans and specifications and construction phases as part of the PDT. Upon MSC approval of this Review Plan, the Review Plan will be posted on the Huntington District Internet for Public Review (http://www.lrh.usace.army.mil/approved_review_plans_rps).

9. MSC APPROVAL

The Great Lakes and Ohio River Division is responsible for approving the review plan. Approval is provided by the MSC Commander. The commander's approval should reflect vertical team input (involving district, MSC, RMC, and HQUSACE members) as to the appropriate scope and level of review for the project. Like the PMP, the review plan is a living document and may change as the study progresses. Changes to the review plan should be approved by following the process used for initially approving the plan. In all cases the MSCs will review the decision on the level of review and any changes made in updates to the project.

10. REVIEW PLAN POINTS OF CONTACT

Questions and/or comments on this review plan can be directed to the following points of contact:

- [REDACTED], Huntington District Project Manager
- [REDACTED], Huntington District Lead Engineer
- [REDACTED], Huntington District Chief, Quality Management
- [REDACTED], Risk Management Center

ATTACHMENT 1: TEAM ROSTERS

TABLE 1: Product Delivery Team		
Functional Area	Name	Office
Project Manager	[REDACTED]	CELRH
Lead Engineer / Civil Design / Relocations	[REDACTED]	CELRH
Real Estate	[REDACTED]	CELRH
Contracting	[REDACTED]	CELRH
Legal	[REDACTED]	CELRH
Public Affairs	[REDACTED]	CELRH
Geology	[REDACTED]	CELRH
Geotechnical (Soils)	[REDACTED]	CELRH
Surveys	[REDACTED]	CELRH
Hydrology and Hydraulics	[REDACTED]	CELRH
Cost Engineering	[REDACTED]	CELRH
Structural	[REDACTED]	CELRH
Electrical	[REDACTED]	CELRH
Mechanical	[REDACTED]	CELRH
HTRW	[REDACTED]	CELRH
Construction	[REDACTED]	CELRH
Specifications	[REDACTED]	CELRH
Environmental	[REDACTED]	CELRH
Economics	[REDACTED]	CELRH
Operations	[REDACTED]	CELRH

TABLE 2: Agency Technical Review Team		
NAME	DISCIPLINE	OFFICE
[REDACTED]	Team Leader	CEMVP
[REDACTED]	Civil/Relocations	CESAJ
[REDACTED]	Geology	CELRN
[REDACTED]	Geotechnical (Soils)	CELRN
[REDACTED]	Hydrology and Hydraulics	CELRP
[REDACTED]	Cost Engineering	CEMVP
[REDACTED]	Structural	CEMVP
[REDACTED]	Electrical	CELRP
[REDACTED]	Mechanical	CELRN
[REDACTED]	Environmental	CELRH

TABLE 3: Independent External Peer Review Team		
NAME	DISCIPLINE	EXPERIENCE
TBD	Geotechnical Engineer	The panel member should be registered as a Professional Engineer, and have a minimum of 10 years experience in geotechnical studies and design of flood control works, including slope stability, through seepage, under seepage, riverbank stability, settlement, and bearing capacity evaluations.
TBD	Structural Engineer	Structural Engineer should be an industry leader with recognized experience in the design and analysis of concrete flood walls, levee-flood wall transitions, flood wall gate closures and water diversion pump stations. The Structural Engineer should well understand uplift and all other forces (static and dynamic) acting on concrete flood walls, gate closures and pump stations, and should be highly proficient in assessing their impact on the stability of the structures via limit equilibrium analysis. The Structural Engineer should have demonstrable experience in the stability analysis and structural design of mass concrete including flood walls and pump stations. Additionally, the Structural Engineer should have demonstrable experience in design of steel structures including flood wall gate closures, identification of fracture critical members, and pump station appurtenances. The Structural Engineer should have a working knowledge of all applicable Corps of Engineers design criteria, industry design criteria, and be familiar with resiliency and other issues identified in the IPET report. The Structural Engineer should be a licensed Professional Engineer.
TBD	Hydraulic Engineer	Hydraulic Engineer must be a registered professional engineer with a minimum of 10 years experience in hydraulic engineering with an emphasis on local protection projects, or a professor from academia with extensive background in hydraulic theory and practice, with a minimum MS degree or higher in hydraulic engineering. Active participation in related professional societies is encouraged. The panel member should be familiar with Corps application of risk and uncertainty analysis of flood damage reduction studies (structural and non-structural), specifically

		related to overtopping of earthen levees and floodwalls. The panel member must have modeling experience with XP-SWMM and standard Corps hydrologic and hydraulic computer models, including but not limited to, HEC-RAS (steady and unsteady) and HEC-HMS.
TBD	Mechanical Engineer	Mechanical engineer should be a registered Professional Engineer, and have a minimum of 10 years experience in mechanical design of flood control works, specifically pump station design. The panel member must be experienced in pump, sump, sluice gate, gatewell, and HVAC design.
TBD	Civil Engineer	Extensive experience in the design, layout, and construction of flood control structures including floodwalls and levees. Demonstrated knowledge regarding hydraulic structures, erosion control, earthwork, concrete placement, design of access roads, and relocation of underground utilities. The Civil Engineer shall be a licensed Professional Engineer, familiar with USACE regulations and industry building codes.
TBD	Engineering Geologist	A recognized expert in the field of rock mechanics with extensive experience in the type of work being performed. The Engineering Geologist shall be proficient in assessing rock strengths. The Engineering Geologist shall be experienced in the design of sheet pile walls and must be knowledgeable of rock foundations for concrete structures. The Engineering Geologist shall have a working knowledge of all applicable USACE design criteria and shall be a licensed Professional Geologist.

Vertical Team

The Vertical Team consists of members of the HQUSACE, Risk Management Center, and Great Lakes & Ohio River Division Offices. The Vertical Team plays a key role in facilitating execution of the project in accordance with the PMP. The Vertical Team is responsible for providing the PDT with Issue Resolution support and guidance as required. The Vertical Team will remain engaged seamlessly throughout the project via monthly telecons as required and will attend In Progress Reviews and other key decision briefings as required. The District Liaison [REDACTED], CELRD-PDS-H, is the District PM's primary Point of Contact on the Vertical Team.

ATTACHMENT 2: ATR CERTIFICATION TEMPLATE

COMPLETION OF AGENCY TECHNICAL REVIEW

The District has completed the Marlinton, WV Local Protection Project (*DDR / P&S*). Notice is hereby given that an agency technical review has been conducted as defined in the Review Plan that is appropriate to the level of risk and complexity inherent in the project. During the agency technical review, compliance with established policy principals and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions; methods, procedures, and material used in analysis; 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 agency technical review team members were from outside the home district. The ATR team leader was from outside the home MSC.

(Signature) _____
Agency Technical Review Team Leader

(Date) _____

(Signature) _____
Project Manager

(Date) _____

CERTIFICATION OF AGENCY TECHNICAL REVIEW

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

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

As noted above, all concerns resulting from the agency technical review of the Marlinton, WV Local Protection Project (*DDR / P&S*) have been fully resolved.

(Signature) _____
Chief, Engineering & Construction Division

(Date) _____