



# INDEPENDENT EXTERNAL PEER REVIEW PANEL

## for the Peckman River Basin, New Jersey, Flood Risk Management Feasibility Study

The U.S. Army Corps of Engineers submits the following information per requirements in the Water Resources Reform and Development Act of 2014, Section 1044(c)(4)(B).

<b>Entity Conducting the Review</b>	
Outside Eligible Organization:	Battelle 505 King Avenue Columbus, OH 43201
<b>Dates of Review</b>	
Review Initiation:	22 June 2018
Type I IEPR Final Report Submittal:	14 August 2018
<b>Reviewer Names and Qualifications</b>	
<b>David Bastian, P.E.</b>	<b>Plan Formulator /Economist</b>
<p>Mr. Bastian is an independent consultant and P.E. for David Bastian Consulting in Annapolis, Maryland, specializing in USACE compliance and policy review, plan formulation and incremental cost analysis, flood risk reduction, and hydraulic and river engineering. He earned his B.S. in civil engineering from the Georgia Institute of Technology and an M.S. in river engineering from Delft University, Holland. Mr. Bastian has over 35 years of experience with USACE and as contractor/consultant on USACE projects involving feasibility studies and public works planning, all based on the USACE six-step planning process. As a reviewer at USACE, Headquarters, he became familiar with, and has direct experience with, Engineer Regulation (ER) 1105-2-100 as well as other USACE engineering regulations, manuals, and pamphlets. He co-authored the USACE Planner's Workshop Manual. His project history demonstrates that he has reviewed and collaborated on more than 100 USACE reports evaluating and comparing alternative plans. Mr. Bastian has 20 years of experience in flood risk evaluation and has worked directly to identify and evaluate flood risk. For nine years he was involved in the coastal economic evaluation for coastal Louisiana restoration, the greater New Orleans hurricane and storm damage risk reduction system, and four other study areas along the Louisiana and Texas coasts. His extensive review experience includes the Delaware River Basin Comprehensive Flood Risk Management Interim Feasibility Study and Integrated Environmental Assessment for New Jersey (2016), Souris River Basin Integrated Feasibility Report/Environmental Assessment (2017), Upper Turkey Creek, Johnson &amp; Wyandotte Counties, Kansas, Flood Risk Management Project; and Kansas Citys Local Flood Protection Project (2005-2006); He helped author the report, provided technical and policy guidance, and supervised District staff in revising feasibility report concerning major metropolitan levee system upgrade for Kansas City, Kansas and Kansas City, Missouri. On the Topeka Local Flood Damage Reduction Project (2006-2007), he provided technical, policy, and writing guidance to the District for design</p>	

deficiency, levee system upgrade, flood risk reduction study. For the Mississippi River Levee System (Units L-455 & R471-460), St. Joseph, Missouri/Elwood, Kansas (2006-2007) study, he provided technical and policy compliance for a flood risk reduction study involving a portion of the levee system. He is familiar with large, complex Civil Works projects with high public and interagency interests through his extensive involvement with the Louisiana Coastal Study area pre- and post-Hurricane Katrina. Mr. Bastian is familiar with USACE flood risk and hurricane/coastal damage risk reduction analysis and economic benefit calculations, including the use of standard USACE computer programs such as the Hydrologic Engineering Center's (HEC's) Flood Impact Analysis (HEC-FIA) modeling program. He has reviewed HEC-FIA and other model applications and their outputs for several flood risk reduction projects for technical economic justification.

During his career, he has developed economic input databases for deep-draft navigation studies at the Institute for Water Resources (IWR) (1980-1987); evaluated deep draft economic feasibility for enlarging the Panama Canal (1987-1993); reviewed feasibility studies for economic justification (1993-1998) at USACE-Headquarters (HQ USACE); and reviewed and/or authored planning and economic analyses for various USACE projects (2001-present), including hurricane and storm damage risk reduction analyses for the New Orleans District, its architectural/engineering firms, and non-Federal sponsors (2006-2011). Since 1993, Mr. Bastian has reviewed USACE studies with a focus on evaluating and comparing alternative plans for compliance with plan formulation processes, procedures, and standards. Since 2001, he has participated in the preparation of the Kansas Citys, Turkey Creek, Texas City, and Boardman flood risk management and post-Hurricane Katrina and Texas City hurricane and storm damage risk reduction studies and has reviewed the Blanchard environmental restoration study, and various dam safety studies regarding plan formulation compliance and economic justification. Mr. Bastian's experience at HQ USACE and as a contractor/consultant on USACE projects includes applying ER 1105-2-100 (Principles and Guidelines) to projects subject to Civil Works project evaluations, all of which involved the six-step planning process. During his career, he has reviewed and collaborated on more than 100 USACE reports evaluating and comparing alternative plans. He also has had direct experience with other USACE engineer regulations, manuals, and pamphlets and was the co-author of the USACE Planner's Workshop Manual. Mr. Bastian has evaluated and conducted National Economic Development (NED) analysis procedures as they relate to flood risk management and to hurricane and coastal storm damage risk reduction. Specifically, for the Kansas Citys, Turkey Creek, Texas City, and Boardman studies, he evaluated traditional NED plan benefits associated with flood risk management and evaluated application of HECFlood Damage Reduction Analysis (HEC-FDA) software. Mr. Bastian's previous employment at USACE included positions as Deputy Chief of Staff for Support, Office Chief of Engineers; Assistant Director of Civil Works, Office Chief of Engineers; technical and policy compliance review expert, Washington Level Review Center; and navigation research, USACE Institute for Water Resources. He has served as a USACE Washington-level technical and policy compliance review expert and managed interdisciplinary reviews of over 70 feasibility reports.

Mr. Bastian's participation in professional societies includes the American Society of Civil Engineers, the American Association of Port Authorities, the Permanent International Association of Navigation Congresses, and the Western Dredging Association.

**Dennis Barnett, P.E.**

**Environmental Law Compliances  
Specialist**

Mr. Barnett is a civil engineer with 43 years of experience in water resource and environmental planning. Prior to joining Tetra Tech in 2009, he had a 34-year career with USACE as a water resource and environmental planner covering both the South Atlantic Division and the Mobile District. Mr. Barnett has extensive experience applying planning principles and procedures to address water resource problems and opportunities, including plan formulation, public involvement, trade-off analysis, and environmental impact assessment. He is a recognized expert in developing and coordinating environmental assessments and impact statements in accordance with the National Environmental Policy Act (NEPA). His experience includes addressing substantive and procedural requirements of relevant environmental laws and regulations and working collaboratively with local, state, and Federal agencies, environmental organizations, and other interest groups on complex and controversial water resource projects. He was responsible for successful quality assurance related to implementation of NEPA for USACE studies and projects in the South Atlantic region, as well as compliance with applicable environmental laws, regulations, policies, and executive orders. He is knowledgeable of USACE regulations and policies governing the presence of hazardous, toxic, and/or radioactive wastes (HTRW) on Civil Works projects and has effectively applied that knowledge to ensure compliance with HTRW requirements for Civil Works projects in the successful completion of numerous planning and post-authorization reports, or in the review of these reports. As a senior USACE environmental planner for 25 years, Mr. Barnett performed, or provided oversight for, planning and environmental activities in support of large- and small-scale water resource projects across the southeastern United States, Puerto Rico, and Virgin Islands. He facilitated the resolution of complex and controversial planning and environmental issues necessary to the successful completion of numerous large and small water resource studies and projects addressing deep- and shallow-draft navigation channel improvements, coastal storm damage reduction, flood risk management, and ecosystem restoration. He participated in the development and evolution of policies and procedures for Civil Works reviews, including agency technical reviews and independent external peer reviews, and facilitated the implementation of those reviews in the USACE South Atlantic region. Following his career with USACE, Mr. Barnett has continued to be involved with USACE Civil Works projects as a consultant with Tetra Tech, including such activities as lead planner for a watershed study for the Detroit District; a principal author of a major EIS for a controversial update of the master water control manual for several reservoirs in the Mobile District; and team leader for completion of cultural resource, wetlands, and endangered species surveys and the assessment of potential impacts on these resources in support of the engineering and design for two significant environmental mitigation features for the Savannah Harbor Expansion Project. In a recent project to develop a stream restoration and trail plan in the highly urbanized downtown Louisville, Kentucky, area, Mr. Barnett completed an inventory of potential HTRW sites within the stream corridor and identified specific areas for detailed analysis in subsequent phases of the project. He has worked with various habitat-based models and procedures to evaluate and select cost-effective ecosystem restoration plans and has led coordination, consultation, and compliance activities to meet the requirements of the Endangered Species Act, Fish and Wildlife Coordination Act, Clean Water Act, and Magnuson-Steven Fisheries Conservation and Management Act (essential fish habitat) for numerous Civil Works projects, both during his USACE career and as a consultant.

**Douglas Spaulding, P.E.****Geotechnical/Civil Engineer**

Mr. Spaulding is a Principal and geotechnical engineer with Spaulding Consultants, LLC, responsible for dam, levee, and floodwall design and inspection. He earned his M.S. in geotechnical engineering from Purdue University, and is a registered professional engineer in Wisconsin, Minnesota, and Michigan. He has 50 years of experience in the design, evaluation, and inspection of water-retaining structures. During his long career, he has provided geotechnical design and evaluation services for flood control levees, embankments, and hydroelectric projects in a 23-state area including New Jersey. His experience includes 10 years with USACE, where he served as Chief of the Levee and Channel Design Section for the St. Paul District. In that capacity, he managed the development of the Pembina levee project in North Dakota and provided geotechnical design services for over \$200 million worth of local flood protection projects in Wisconsin, Minnesota and North Dakota. The Pembina project and the Mankato and Winona flood control projects in Minnesota all included extensive sections of floodwall (both I-wall and T-wall configurations). In addition, for the Winona project, Mr. Spaulding supervised the evaluation of underseepage using a drainage trench. He also served as the Program Manager for the National Dam Safety Program in Wisconsin and Minnesota. He has experience with lock structures in Minnesota and Michigan and served on the design team for the rehabilitation of Lock and Dams No.1 and No.2 on the Mississippi River and managed the design of several hydroelectric projects at dams on the Mississippi and Red Rivers. Mr. Spaulding's geotechnical background includes evaluating the stability of levee sections founded on soft clay foundations. His experience also encompasses geotechnical design of bridge foundations, cellular sheet pile structures, sheet pile tieback walls, conventional gravity walls, and pump stations founded on sand and soft clay deposits. He has provided design services for embankments using preload fills to strengthen underlying foundation deposits. He recently served as a consultant to evaluate the instability caused by a sanitary landfill founded on over 100 feet of soft lacustrine clay. All of the local flood control projects for which Mr. Spaulding has provided design services have involved at least several gatewells to accommodate gravity drainage. As part of his experience, he applied USACE risk-informed approaches to the evaluation of safety issues at USACE navigation, flood control, and hydroelectric projects. Mr. Spaulding also provided dam safety training for USACE operations personnel at navigation and flood control projects from 1988 to 2010. Over the last 10 years, Mr. Spaulding has participated in more than 75 Potential Failure Mode Analysis (PFMA) evaluations of dams and hydroelectric projects. As a facilitator of PFMA evaluations authorized by the Federal Energy Regulatory Commission, Mr. Spaulding has directed more than 50 evaluations for embankment dams, concrete gravity structures, and arch dam structures. Mr. Spaulding has served on IEPR review panels dealing with local flood protection projects such as levees, channels and floodwalls, dam remediation, dam replacement, and seepage control system upgrades. This experience has provided extensive background in USACE's Safety Assurance Review (SAR) requirements. Mr. Spaulding has provided peer review services on two reaches of hurricane protection projects in the New Orleans area. In 2008, he peer-reviewed the geotechnical design of the New Orleans Group 1 to Group 3 pump stations. In 2010, Mr. Spaulding also served on the IEPR team reviewing the Olmsted Lock and Dam structure on the Ohio River. In 2014 he served on the IEPR evaluation team for the Pine Creek dam remediation in Oklahoma, assessing proposed methods to control internal embankment seepage around an existing conduit that had created large internal voids in the 50-year-old dam. In addition, Mr. Spaulding currently serves on two FERC-appointed Boards of Consultants reviewing the design of two major hydroelectric projects and was appointed

to the Department of Energy (DOE) Peer Review panel to evaluate ongoing DOE-sponsored research related to dams and hydroelectric generation. He recently served on a Bureau of Reclamation review panel for the Folsom Dam spillway addition. Mr. Spaulding is a lifetime member of the American Society of Civil Engineers. He also is a member of the Minnesota Geotechnical Society, the National Hydropower Association, and the Construction Panel for the Minneapolis section of the American Arbitration Association.

**Steven Davie, D.CE., P.E.**

**Hydrologic & Hydraulic Engineer**

Mr. Davie is a civil engineer with over 23 years of experience working on river, tidal, and coastal-related projects involving hydrodynamic modeling, coastal engineering, mitigation, engineering design, feasibility studies, EIS development, and data collection. He received an M.E. in civil engineering, with an emphasis on coastal engineering, from the University of Florida in 1997. He is a registered professional engineer in Georgia and has specialized in coastal/riverine hydraulics with more than 40 applications to estuaries, ports, and navigation channels. Mr. Davie has managed multidisciplinary projects drawing on his leadership and mentorship capabilities. He has managed and served as a technical leader on several large projects such as the Savannah Harbor Expansion Project, Post 45 Charleston Harbor Deepening, Panama Canal Third Set of Locks, Port Qasim in Pakistan, Choctaw Point Terminal in Alabama, and the Calcasieu Ship Channel in Louisiana. As an expert in the field of urban hydrology and hydraulics (H&H), Mr. Davie has worked on numerous H&H projects in locations such as the City of Atlanta (Chattahoochee River), the City of Memphis (Lick Creek), and the Tittabawassee, Mobile, Kalamazoo, and Fox Rivers. Most recently, Mr. Davie is leading the Hurricane Irma Recovery Support for the St. Marys River waterfront project. He was the lead coastal engineer to support a construction and engineering team to rebuild the waterfront for the City of St Marys in southeast Georgia. Mr. Davie has a thorough understanding of open-channel systems and tidally influenced riverine systems. He was lead hydraulic engineer on the 2011 Hurricane Plan for the Inner Harbor Navigation Channel (IHNC), Lake Borgne Surge Barrier design-build project. The purpose of the hydraulic study was to determine the operations scenario for the Bayou Bienvenue Lift Gate during the 2011 hurricane season. The hydraulic calculations assisted the team on the velocities expected through the gate and scour protection for the structure and adjacent wetlands. Additionally, in 2014, on the Savannah Harbor Expansion Project, Mr. Davie was Principal-in-Charge for the design of two mitigation projects to offset the effects of deepening the navigation channel. First, the flow diversion project in the upper estuary was developed to divert freshwater from the Savannah River to the sensitive parts of the middle estuary, on the Middle and Little Back Rivers. Second, the New Savannah Bluff Lock and Dam Fish Passage was developed to allow sturgeon and other fish to pass around the lock and dam to upstream spawning grounds near Augusta, Georgia. Mr. Davie has a thorough understanding of the HEC's River Analysis System (HEC-RAS) model. His master's thesis was titled "Determination of Roughness Coefficients in Heavily Vegetated Flood Plains and Their Use in the HEC-RAS model." Working with Dr. Bent A. Christensen at the University of Florida, Mr. Davie analyzed several flood events in Florida, on the Mississippi River, and on the Red River for HEC-RAS results and the validity of the Manning equation in heavily vegetated floodplains. Mr. Davie was selected as a Diplomate in Coastal Engineering (D.CE) in 2014 by the Academy of

Coastal, Ocean, Port and Navigation Engineers. He is a member of the Coasts, Oceans, Ports, and Rivers Institute (COPRI), the American Society of Civil Engineers (ASCE), the Society of American Military Engineers, the American Association of Port Authorities, the Waterways Infrastructure Subcommittee (ASCE/COPRI) in 2015-17, and the ASCE Ports & Harbors Technical Committee.