



INDEPENDENT EXTERNAL PEER REVIEW PANEL

for the Bourne and Sagamore Highway Bridges, Cape Cod Canal Federal Navigation Project, Bourne, Massachusetts

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).

Entity Conducting the Review	
Outside Eligible Organization:	Battelle 505 King Avenue Columbia, OH 43201
Dates of Review	
Review Initiation:	15 October 2019
Type I IEPR Final Report Submittal:	8 January 2020
Reviewer Names and Qualifications	
Ken Casavant, Ph. D.	Plan Formulator/Economist
<p>Dr. Casavant is a professor and economist at the School of Economic Sciences at Washington State University, Director of the Freight Policy Transportation Institute, and adjunct professor at North Dakota State's Upper Great Plains Transportation Institute. He earned his Ph.D. in agricultural economics from Washington State University in 1971. Dr. Casavant has nearly 50 years of experience as an economist, with expertise in flood risk management plan formulation assignments—particularly, the evaluation and comparison of alternative plans for numerous flood risk management projects, including Continuing Authorities Program (CAP) Section 205 projects. He has served as an economic consultant detailing the tradeoffs necessary on several multi-objective public works projects, most recently on studies of the deep-draft national and international maritime industry and flood risk management.</p> <p>Dr. Casavant is very familiar with USACE plan formulation processes, procedures, and standards. He has more than 15 years of experience in plan formulation, evaluation, and comparison of alternative plans for numerous flood risk projects, navigation studies (lock replacement), ecosystem restoration projects, and feasibility studies, including his technical reviews of the Lower Columbia River Channel Deepening Project, the Upper Mississippi and Illinois Navigation Study, the Barataria Basin Barrier Shoreline Restoration Study, and the Mississippi River Gulf Outlet Ecosystem Restoration Plan, many of which included flood risk management requirements. The Mississippi-Illinois system project was a navigation lock system replacement project that included coastal inland waterway system needs. For the Lower Columbia River project, Dr. Casavant analyzed the costs of deep-draft shipping and the impacts of those costs on the project. The supply chains and alternative movements of maritime steam ships were a focal point of the analyses. For the Delaware River Main Channel Deepening Project, he assessed and documented the benefits of the project. For the Upper Mississippi and Illinois Navigation Study, he examined alternative shipping flows, including shallow and deep draft, and performed benefits calculations as part of the economic evaluation. Much of his background deals with the impacts of infrastructure change.</p>	

Dr. Casavant has worked with USACE methodologies for cost effectiveness/incremental cost analysis (CE/ICA) and has a detailed knowledge of USACE standards and procedures, including the Institute for Water Resource (IWR) Planning Suite. As an economist or a combined Civil Works planner/economist for USACE IEPRs, he has studied and evaluated alternative plans for navigation lock replacement projects as well as navigation/dredging projects, such as the Savannah Harbor Expansion Project General Reevaluation

Report. Over the last 10 years, he has worked on 13 USACE projects for which he has applied USACE standards and procedures, including the IWR Planning Suite methodologies, with a focus on effective and efficient ecological and natural sustained output per dollar of relevant expenditure for alternative project formulations. He has applied the USACE six-step planning process, which is governed by Engineer Regulation (ER) 1105-2-100, *Planning Guidance Notebook*, during his work as a technical reviewer and peer reviewer on more than 20 projects, such as the Port of Iberia Channel Deepening Project in 2006 for USACE; the External Independent Economic Opinion on Identifying and Measuring NED Benefits: Navigation Shipping; and the Morganza to the Gulf IEPR study, a hurricane protection and storm damage risk project.

Dr. Casavant has experience identifying, reviewing, and evaluating impacts on environmental resources from structural flood risk and impacts related to hurricane and coastal storm damage risk reduction projects. As part of other IEPRs, he has reviewed assessments prepared using Hydrologic Engineering Center-Flood Damage Reduction Analysis (HEC-FDA) software, HEC Life Loss/Direct Damage Estimate (HEC-LifeSim) simulation software, and/or HEC Flood Impact Analysis (HEC-FIA) software. Whether reviewing risk assessments developed using Monte Carlo evaluations or traditional risk models in the IWR Planning Suite, he has broad and applied experience working with risk-informed approaches to decision making. The six most recent projects he has contributed to had critical components concerning the impacts of environmental resources from flood risk and coastal storm damage. He has also been a plan formulator expert on Louisiana Water Resources Council (LWRC) IEPRs; several of the projects under review had a specific objective to evaluate the damage reduction and the risk associated with achieving benefits from flood risk management, with one project focusing specifically on the impact on shorelines.

Dr. Casavant has published more than 70 journal articles and has contributed to hundreds of written documents, including chapters in books, books, abstracts, proceedings, professional materials, conference papers, and research bulletins, circulars, and reports. He is a member of numerous professional associations, such as the Transportation Research Board–National Research Council, the International Agricultural Economics Association, and the Logistics and Physical Distribution Association.

Paul Bovitz

Environmental Law Compliance/Cultural Resources Specialist

Mr. Bovitz is an environmental scientist and project manager based in Hillsborough, New Jersey. He has more than 33 years of technical experience in ecological assessment and natural resources management in public, private, and academic sectors, encompassing a variety of geographic regions and aquatic environments. Originally a native of Massachusetts, he has a bachelor's degree in wildlife biology and earned an M.S. in ecology from Rutgers University in 1992. Mr. Bovitz has over 25 years of experience evaluating and conducting National Environmental Policy Act (NEPA) impact assessments and has served as a peer review panel member on several IEPRs for USACE Civil Works projects in the role of NEPA compliance. He has extensive experience working for the USACE New York and New England Districts both in environmental remediation and in NEPA-related projects.

Mr. Bovitz's technical expertise includes ecological risk assessment and management of contaminated sediments, endangered species issues, water quality and storm water studies; wetlands delineation, assessment, mitigation and permitting; and essential fish habitat investigation. In addition, as a project manager for NEPA assessments, he has supervised historical and cultural resources investigations and has been responsible for ensuring National Historic Preservation Act compliance on various projects. Mr. Bovitz has a strong knowledge of law and policy associated with hazardous, toxic, and radioactive waste (HTRW) issues, including the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). He is a Licensed Site Remediation Professional (LSRP) in New Jersey and has extensive experience as a USACE and EPA contractor in investigation and remediation of CERCLA sites. He is also a certified Professional Wetland Scientist (PWS), a Certified Energy Manager (CEM), and a LEED® Accredited Professional (LEED AP).

Mr. Bovitz is a member of the New Jersey Governor's Science Advisory Board, Ecological Sciences Committee, and served on the New Jersey Department of Environmental Protection, Comparative Ecological Risk Analysis Panel. Relevant Midwest experience includes his participation in the Ecological Assessment of Kalamazoo River, Enbridge Oil Spill, Marshall, Michigan, U.S. Environmental Protection Agency Region 5 (EPA Representative); and his participation as an IEPR panel member focused on identifying ecological and HTRW issues for the Wood River Flood Control Project, USACE, St. Louis District. He has served on other IEPRs that included various degrees of ecological restoration components as well.

Mr. Bovitz is an active member of the Society of American Military Engineers, a New Jersey chapter of the Society of Environmental Toxicology and Chemistry, and other professional groups, and attends meetings of the Association of Environmental and Engineering Geologists. In 2014, he chaired a session on urban ecological restoration for the Conference on Ecological and Ecosystem Restoration meeting in New Orleans.

Rune Storesund

Cost Engineer

Dr. Storesund is the Principal Engineer at Storesund Consulting, the CEO and President of Storesund Construction Services, LLC, and the Executive Director of the University of California (UC), Berkeley, Center for Catastrophic Risk Management. He also serves as an on-call expert geotechnical engineer (G.E.) to the State of California's Department of Consumer Affairs for its annual examination. He earned his doctorate (D. Eng) in civil engineering from UC Berkeley; is a registered civil engineer in California, Louisiana, Hawaii, and Washington, and is a registered G.E. in California. He has over 18 years of experience in planning, design, operation and maintenance (O&M), construction, and decommissioning of Civil Works structures and has worked on a variety of projects throughout the United States and internationally. His research interests are on characterization and use of uncertainty as risk mitigation techniques in complex socio-technical systems, with active research projects for the California Legislature on dam safety following the 2017 Oroville Dam Primary Spillway failure and California Public Utilities Commission on wildfire risk mitigation following the 2018 Camp Fire.

Dr. Storesund is familiar with large, complex Civil Works projects with high public and interagency interests, both as a design engineering and a general engineering contractor. He has participated in numerous projects related to USACE geotechnical practices. For more than 10 years, he directly participated in engineering design, specification development, Design Review and Checking System (DrChecks) collaboration, and Micro-Computer Aided Cost Estimating System (MCACES/MII) cost evaluations. Transportation and navigation projects Dr. Storesund has worked on include: (1) Doyle Drive reconstruction in San Francisco, California, which was a \$500 million transportation project replacing a seismically deficient viaduct adjacent to San Francisco Bay; (2) \$500 million

San Francisco Seawall Earthquake Safety Program, City and County of San Francisco; (3) \$125 million Caltrans Interstate 238 (I-238) Widening Project, Alameda County, California; (4) Brooklyn Basin Dredging Study, Oakland, California; (5) Dow Chemical Wharf, Pittsburg, California; (6) Harbor Point Shoreline Stabilization Project, Tiburon, California; (7) Emeryville Shoreline Protection Project, Emeryville, California; (8) Alcatraz Hydrodynamic Evaluation, City and County of San Francisco, California; (9) Emeryville Marina Breakwater, Emeryville, California; (10) Nelson's Marine Shoreline Stabilization, Alameda, California; (11) Loch Lomond Breakwater Improvement Project, San Rafael, California; and (12) Richmond Marina Breakwater Improvements, Richmond, California.

Dr. Storesund has extensive experience with safety assurance reviews (SARs), having participated in the SAR for the USACE Princeville IEPR. In addition, in the aftermath of Hurricane Katrina, he participated in an ASCE assessment that served as the basis for the Guiding Principles for conducting USACE SARs. He has been active in advancing risk-informed decision-making for critical infrastructure identification and management of uncertainties. His 'systems' synthesis perspective is unique among his peers, and he has routinely evaluated the application of redundancy, resiliency, and robustness.

Dr. Storesund has been an active participant in American Society of Civil Engineers (ASCE) committees on the local and national level since 1998 and is currently an ASCE Governor for Region 9 (State of California). He is a Senior Member of the National Academy of Forensic Engineers and the National Society of Professional Engineers.

Bill Remington	Civil Engineer/Structural
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Mr. Remington is a senior engineering consultant with Kleinschmidt Associates and specializes in civil, structural, hydraulic, transportation, and environmental engineering, as well as construction contract administration and project management. He earned an A.A.S. degree from the State University of New York-Delhi, a B.S. and M.S. in civil engineering from Clarkson University in Potsdam, New York, and an M.B.A. from Thomas College in Waterville, Maine. Mr. Remington is a registered professional engineer in Georgia, South Carolina, North Carolina, Virginia, Maryland, Delaware, and Maine, with recently retired licenses in Pennsylvania, New York, Vermont, and New Hampshire. He is Kleinschmidt's Senior Project Manager and Quality Control Reviewer for civil, site, water resource, structural, and hydroelectric/dam safety-related projects.

Mr. Remington has substantial experience with design and project management on site improvements, stormwater, water/wastewater treatment systems, municipal utilities and roads, industrial facilities, airports, railroads, transportation, bridges, hydroelectric, dams, planning, site remediation, site development, flood protection, and water resources projects. He has experience in construction management as well as design/build project management. He is also the Corporate Safety Officer for Kleinschmidt Associates, setting up and maintaining the safety program and procedures.

Mr. Remington has over 25 years of experience in municipal services, including being Superintendent of Public Works for Warren County in upstate New York. He was responsible for all Department of Public Works operations, which included divisions of highways and bridges (Highway Manager), buildings and grounds, equipment maintenance, parks and recreation (Director), railroad, airport (Airport Manager), engineering, water/wastewater, county capital projects, New York State and Federal capital projects, solid waste and recycling, and civil defense and natural disaster (Director of Civil Defense and Natural Disaster). Administration included planning, personnel, union issues, safety, facilities, equipment, construction projects, environmental, budgets, grants, permitting, and legal matters. He served as Chairman of the

Adirondack/Glens Falls Transportation Council Technical Advisory Committee (Metropolitan Planning Organization), Executive Board Member of the New York State County Highway Superintendents Association, and member of the New York State and Warren County Traffic Safety Boards, the County Planning Board, and numerous other associated affiliations. He was responsible for maintenance, design, permitting, construction, and inspection of 72 bridges, including 12 bridge replacements as the County Superintendent.

In other municipal and government experience, Mr. Remington has been the on-call consulting engineer for numerous towns and counties in Maryland, Delaware, and Virginia. This on-call service included design, project management, planning reviews, maintenance/operations recommendations, studies, and environmental permitting. He has also been the Project Manager and Engineer-in-Charge of National Aeronautics and Space Administration (NASA) projects in Wallops Island, Virginia.

Mr. Remington has industrial experience in the paper industry, specializing in capital project management, emergency repairs, and environmental compliance. He has worked on several construction management teams to plan, construct, start up, and implement O&M training. He is a member of the ASCE (past president of Maryland Eastern Shore Chapter) and has substantial training in Occupational Safety and Health Administration (OSHA) safety, project management, quality control, contract documents, and construction supervision. He also has Roadmaster Level 2 certification training from the Cornell Local Roads Program (highways and bridges).