Tulane Environmental Law Clinic

February 22, 2021

By Email to: steve.w.roberts@usace.army.mil **and U.S. Mail**
Mr. Steve Roberts
U.S. Army Corps of Engineers
Regional Planning and Environment Division South
New Orleans Environmental Branch, CEMVN-PDC-CEC
7400 Leake Avenue
New Orleans, LA 70118-3651

Re: Supplemental Comments on BCMU Element 10

Dear Mr. Roberts:

On behalf of the Atchafalaya Basinkeeper, the Louisiana Crawfish Producers Association – West, Healthy Gulf, and the Sierra Club Delta Chapter (collectively, "Citizen Groups"), please receive and consider the attached declaration of Dr. Ivor Van Heerden on the U.S. Army Corps of Engineers' ("Corps'") proposal to construct Element 10 of the Buffalo Cove Management Unit. Dr. Van Heerden's opinion that Element 10 would irreversibly and severely impact wetlands and specifically poses a significant threat of causing excessive sedimentation and the uneven distribution of sediment in the proposed project area supports Citizen Groups' July 18, 2018, comments in opposition to this proposed project. As indicated in the Declaration, Dr. Van Heerden's opinion was formed after recent site visits and measurements as well as review of recent information from the Corps such as the Corps' August 2020 Finding of No Significant Impact. As such, Dr. Van Heerden's opinion is derived in part from information not available during the Corps' initial public comment period.

Citizen Groups' members are highly concerned about the irreversible damage this project will cause to the precious resources of the Basin, which for some provide their livelihood and are an essential aspect of their Cajun culture. Citizen Groups would welcome an opportunity to present their concerns directly to you and other decision-makers prior to authorization of this work.

Ultimately, the Corps should not proceed with this project, as it is in violation of the Clean Water Act 404(b)(1) Guidelines ("Guidelines") and public interest regulations, and the National Environmental Policy Act.

Respectfully submitted,

/s/ Lisa Jordan
Lisa W. Jordan, Director
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Counsel for the Atchafalaya Basinkeeper, the Louisiana Crawfish Producers Association – West, Healthy Gulf, and the Sierra Club Delta Chapter

Enclosures

DECLARATION OF DR. IVOR VAN HEERDEN

1. My name is Ivor van Heerden. I am more than eighteen (18) years old and am competent to make this declaration. I am an expert in the fields of wetlands and wetland hydrology, sedimentation, and eutrophication. I hold a doctorate degree in Marine Sciences from Louisiana State University (LSU), a master's degree in Marine Sciences from LSU, and bachelor's degrees in Geology and Botany from the University of Natal in South Africa. I was formally employed as an academic research scientist on the faculty of the LSU Department of Civil and Environmental Engineering.
2. My qualifications and experience are more thoroughly set out in my curriculum vitae, a copy of which is attached hereto as Exhibit A.
3. This Declaration contains my expert opinions, which I hold to a reasonable degree of scientific certainty. My opinions are based upon sufficient facts or data, consisting specifically of a review of the references and documents listed at the bottom of the Declaration as well as numerous site visits to the Buffalo Cove Management Unit including on December 28, 2020. These are facts and data typically and reasonably relied upon by experts in the fields of environmental and civil engineering. Also, I have developed my opinions using reliable principles and methods which I have applied in a scientific and reliable manner to the facts of this subject matter.
4. In December 2020 I was hired by the Tulane Environmental Law Clinic to analyze the impacts of the "Element 10" project proposed by the U.S. Army Corps of Engineers ("Corps") as part of the Buffalo Cove Management Unit in the Atchafalaya Basin and described in EA #441 ("the proposed project" or "Element 10") and to opine as to those

impacts in the relevant floodplain. The area of the proposed development is specified in maps attached to the Corps' June 2018 public notice on this project.

5. I have reviewed documents pertaining to the Buffalo Cove Element 10 project. The list of documents is attached as Exhibit B.
6. In my opinion, the proposed project will result in significant irreparable damage to coastal wetland integrity and storm responses, and will irreversibly and severely impact wetlands, hydrology, aesthetic qualities, biological resources, and public safety, if completed as designed.
7. More specifically, Element 10 poses a significant threat of causing excessive sedimentation and the uneven distribution of sediment in the Basin's irreplaceable bayous, swamps and wetlands. Dredging the spoil banks will increase the amount of water flowing between the Atchafalaya River and Buffalo Cove, resulting in a greater amount of sediment flowing into and being deposited into the canals. This influx and deposit of additional sediment will only accelerate the sediment accretion already occurring in the Basin. Sediment accretion in the Basin destroys valuable wetlands and deep-water habitats that serve as important areas for migratory birds, wildlife, fishing and recreation. As sediment continues to fill the Basin's waterways, the wetlands disappear, leaving downstream and coastal Louisiana communities more vulnerable to flooding. The continued sediment capture in the Basin also prevents this sediment from flowing down to the coast, where it is desperately needed to replenish coastal land loss.
8. The Corps' dredging projects implemented pursuant to the BCMU have already adversely affected the productivity of fishing and crawfishing in the area, because these dredging projects have brought more water into the Basin's deep-water habitats and wetlands, causing

an influx of suspended sediment deposits and destroying valuable fishing and crawfishing areas. Element 10 will only add to the degradation of fishing and crawfishing waters by acting as a conduit for additional river water into the deep-water areas of the Basin. Indeed, the design of Element 10 will effectively send water from distributaries of the Atchafalaya River into deep-water areas in the Basin's interior.

9. Based on my observations of the Buffalo Cove Management Unit, including the area of the proposed Element 10 project, I can attest that, despite the Corps' construction of many previous elements within the system, there is observable sediment accreting in seasonable, discernable patterns in the area, already far exceeding the "one inch" accretion of sediment that the overall BCMU project seeks to avoid.

10. I am aware that the Corps has access to data on the accumulation of sediment and the water quality in the Buffalo Cove Management Unit since the inception of that project, collected by LSU and the United States Geological Survey (USGS). The monitoring data is not publicly available, despite the Corps' reliance on it to conclude that "Element 10 would improve circulation and partly improve the function of previously constructed BCMU elements upstream." I am aware the Atchafalaya Basinkeeper, among others, have requested this information from all relevant sources over the course of several months but the data has not been forthcoming. I believe this data would likely show that the Corps' implementation of the Buffalo Cove Management Unit has led to increased sedimentation and decreased water quality in the area,

11. My own observations in and around the area where Element 10 has been proposed support my conclusion that measurable sedimentation far exceeding 1 inch per year has already accumulated and that observable patterns in sediment layers indicate that there has been a

significant increase in accretion over time. The field investigation 28 December 2020 included digging test pits from 450 feet to 1600 feet from a canal (Tyler cut Element 12) that formally was an oilfield access canal but was redredged and had levees shaved. This redredging of a canal directly off Lake Fausse Point Cut, a major discharge and suspended sediment laden canal, was completed in June of 2016. The US Army Corps of Engineers EA #366 describes the various Elements of the Buffalo Cove Project in detail. The EA states that the measurable goals include "limit sediment accretion to less than 1 inch per year in the areas of influence (figure 12) 200 yards or more from water inlets or bank shavings, as well as the open water areas of Jackass Bay, Bayou Gravenburg, the remnants of Grand Lake near Prejean Canal, and the area to the east of Poncho Chute." All test pits revealed accretion was way in excess of this 1 inch per year goal, in fact by many more inches per year. 1600 feet from the end of the Tyler Cut excavation done as part of element 12 revealed at least 6 inches of accretion the last time the area was flooded, namely the 2019/2020 floods. Similarly, a test pit 3000 feet from Si Bon Canal along Bayou Eugene showed very significant deposition since 2016. This Canal was also a part of Element 12 exacerbated in 2016 including cuts in levees. Thus, the proposal to send additional sediment-carrying water farther into deep water areas of the Basin through the Element 10 dredging project will not reverse this pattern of sediment accumulation. Rather it will exacerbate the problem.

12. Water quality in the interior of the Basin will be adversely affected by Element 10's construction. Specifically, the cuts and dredging project proposed will facilitate the entry of river water that carries Mississippi River fertilizers and other nutrients from upstream areas into the Basin interior, which will disrupt water quality leading to eutrophication and

Hypoxia, and increase algal growth as well as destroy existing natural growth and disrupt the Basin food chain.

13. The survival of the Basin's wetlands is critical to protecting coastal Louisiana from Mississippi River floods. During storm surges and periods of flooding, the Basin's wetlands act like a sponge, effectively absorbing flood waters. Reduction of their carrying capacity through increased sedimentation will lead to less absorption of floodwaters in the Basin and increased floodwaters continuing downstream to the greater New Orleans area. Given the effects of global warming and sea level rise, with the increased volume and strength of hurricanes and other storms, it is particularly vital that the Basin retain all absorption capability.

14. Based on my review of Corps documentation, the Corps has paid very little attention to the consequences of siting this project in the Atchafalaya Basin Floodway. It will result in greatly enhanced suspended sediment infilling of the Floodway, reducing its flood water carrying capacity as part of the Mississippi River and Tributaries (MR&T) flood control strategy, and eventually, along with other Corps projects that are already infilling the Floodway, contribute to catastrophic flooding of adjacent communities and major built environments such as New Orleans, Morgan City and others.

15. I have considered (1) the effects of overarching and controlling/influencing processes associated with global warming, accelerated sea level rise, and ever-increasing annual rainfall totals; (2) historic sedimentation intrusion in the Basin as a result of the Corps' and others' activities; (3) historic water quality degradation in the Basin as a result of the Corps' and others' activities, and I have conducted my own field observations in the proposed area

of construction for the Buffalo Cove Element 10 project in reaching the conclusions set forth herein.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on the 14th day of February 2021.

Ivor van Heerden, Ph.D.

EXHIBIT
A

Resume – Ivor Ll. van Heerden, Ph.D.

EDUCATION

- Ph.D. (Marine Sciences), Louisiana State University, 1983.
- M. Sc. (Marine Sciences), Louisiana State University, 1980.
- B. Sc. Honours (Geology), University of Natal, South Africa, 1976.
- B. Sc., University of Natal, Pietermaritzburg, South Africa, 1975.

RESUME OVERVIEW

As a research academic and a consulting scientist I have had wide exposure to wetland management and restoration from mountain uplands to vast swamp complexes. In 1977 I started my graduate studies, funded by the US Army Corps of Engineers, on the evolving Atchafalaya Delta in central Louisiana. This research interest expanded up into the Atchafalaya Basin, the largest riverine swamp in the US. And, then across the Gulf Coast. Additionally, through involvement with the coastal restoration efforts in Louisiana, principally the Coastal Wetland Planning and Protection Act (CWPPRA), I advised several governmental agencies, drafted up the first 'Big-Picture" Management Plan for the Louisiana coastal zone (1994) and designed many tens of wetland and barrier island restoration projects. These combined exceed $100 million. In addition, the 1994 Big Picture Plan is now the framework for the large-scale coastal wetland restoration in Louisiana being funded principally by BP Horizon Oil Spill penalties.

For almost 40 years I was closely involved in the management of the Greater St Lucia Wetland Park in South Africa. This park obtained South Africa's first Natural World Heritage status in 1999 by UNESCO and comprises an impressive 175 miles of coastline - starting south of the St Lucia Estuary and stretching past Kosi Bay all the way to Mozambique. It is an eco-tourism mecca with 21 different eco-systems.

I have also had wide exposure to state, federal and local environmental regulations and their enforcement. I have at times worked closely with EPA's Region 6, the EPA-CID, Louisiana Department of Environmental Quality, LA Wildlife and Fisheries, LA Department of Natural Resources and various local agencies. For 6 years I served on the EPA Science Advisory Board related to environmental and ecological issues. I have also been involved with US Fish and Wildlife Service and have had in the past a working relationship with National Marine Fisheries Service.

As a former Assistant Secretary of the LA Department of Natural Resources, I ran both the Coastal Restoration and Coastal Management Sections. The latter dealt directly with permitting in the coastal zone, oil field waste and abandoned (orphan) well issues as well as environmental enforcement. During my tenure, I worked closely with the Legislature on various pieces of legislation including two constitutional amendments. I represented the Governor in Congress and met with numerous congressmen and senators working closely with Louisiana Senators John Breaux and J. Bennett Johnston. Subsequently I had

a number of dealings with former Senator Mary Landrieu. I have testified before Hill Committees.

Whilst an academic, and also afterwards as a consultant on the BP Horizon Oil Spill; I had to deal daily with the Oil Pollution Act and Coast Guard regulations. I have had HAZMAT training and have a Certification. During my tenure with Woodward Clyde consultants I served on their National Spill Response Team with training in bioremediation. I have Shoreline Cleanup and Assessment Technique (SCAT) training and served as a SCAT team leader for two years of the BP Horizon Oil Spill.

I ran a public health research center for a number of years principally focused on hurricanes and their impacts.

I have extensive experience as a manager and leader whether the dangerous world of marine diamond mining, running a state government agency, or managing multimillion-dollar research projects. I have had extensive experience in teaching as well as communicating complex concepts to the public. During my career I have given hundreds of interviews and participated in a number of documentaries. I am told I am a great communicator. All through my career I have had to use my writing skills to the extent of writing non-fiction books and book chapters, scientific papers and such.

As someone with a scientific background and nature, if I find I am not fully up to date with an issue, I go out and research it and am not afraid to ask others for advice or guidance. Getting it right is often a team effort.

PARTIAL EMPLOYMENT RECORD

2010 - 2012. Consultant on BP Gulf of Mexico Oil Spill

Subcontractor to Polaris Applied Sciences as a SCAT team leader. Responsible for leading a team of state and federal regulators. Also had to certify if clean-up was complete area by area.

2002 – 2010. Director, Center for the Study of Public Health Impacts of Hurricanes*, a Louisiana Board of Regents (BoR) Health Excellence Fund Center*

As Director, I was the Lead Principal Investigator (PI) of a five-year pilot study within the new public health center, focusing on the greater New Orleans metropolitan area, entitled, "Assessment and Remediation of Public Health Impacts of Hurricanes and Major Flooding Events." The project received in excess of $3.65 million from the Louisiana Board of Regents. Additional funding came from state agencies and private foundations.

As Lead Principal Investigator (PI) I collaborated with sixteen PI's and researchers from three universities. Consulted with an Advisory Board on the Center and New Orleans public health project, including representatives from the LA Governor's Office of Emergency Preparedness (OEP); Jefferson, New Orleans, Plaquemines, and Saint Bernard Parish OEPs; Governor's Office of Coastal Activities (GOCA); LA Department of Health and Hospitals (DHH) Office of Public Health (OPH) and Office of Mental Health (OMH);

LA Department of Environmental Quality (DEQ); LSU School of Medicine; East Baton Rouge Parish Animal Control; Fire Chiefs, and New Orleans Sewerage and Water Board.

Headed up the state of Louisiana's official forensic levee failure investigation.

2000 – 2010. Associate Professor, Department of Civil and Environmental Engineering, LSU

- Participation in academic programs including development of and teaching a new course, "Hazards, Disasters and the Environment;"
- Program development and supervision in the area of natural disasters, and other aspects of natural systems management and engineering. Responsible for interagency coordination, proposal and project development, transfer of technology, and the management of applied research projects related to the environment that affect infrastructure, resources and environmental systems.
- Basic and Applied research related to natural disasters, coastal and fluvial processes, coastal erosion, environmental restoration including wetlands, dredging, landfills and groundwater issues, and other natural system management and engineering issues. Where applicable, this research was published in the scientific literature.
- Deputy Director, LSU Hurricane Center. Participation included course development, instruction, research supervision, thesis and dissertation committee membership, and seminars.
- $ 7.9 million in research dollars; average of approximately $1,000,000 p.a.
- Technical assistance to state and federal agencies dealing with natural and industrial disasters, environmental restoration, and resource management.

1992 – 2000. Director, Natural Systems Management and Engineering Program, Center for Coastal, Energy, and Environmental Resources (LSU)
Research into a wide variety of coastal and environmental issues including restoration, dredging, landfills, groundwater issues, environmental contamination, amongst others. Teaching and public outreach. Consultant to CWPPRA at various levels.

1991 - 1992. Woodward-Clyde Consultants, Baton Rouge, Louisiana, Head of the Coastal Sciences, Wetlands and G.I.S. Group
Principally hired to develop three new markets for the company namely; coastal wetland restoration, oil spill contingency planning and response, and G.I.S. Penetration into all three markets was very good including consulting with Kaiser Aluminum concerning the beneficial use of some of their byproducts for wetland restoration; Exxon Shoreline Cleanup Assessment Technology (SCAT) program support to Louisiana Geological Survey.

1994 – 1995. Assistant Secretary, Louisiana Department of Natural Resources, Office of Coastal Restoration and Management, Baton Rouge, LA
This was a Governor appointed position. I headed both the Coastal Restoration and Coastal Management Divisions. The Coastal Restoration Division is charged with

implementing the state's Coastal Wetlands Conservation and Restoration Plan. The Division performs the functions of the state relative to conservation, restoration, and enhancement of the state's coastal wetlands resources under the authority of Louisiana Coastal Wetlands Conservation Act of 1989. This Division is mandated to plan, operate, maintain, and monitor projects that are designed to conserve, enhance, restore, and create coastal vegetated wetlands. Funding is through a dedicated, recurring source of revenue constitutionally established in the state treasury. This trust fund also provides the financial base for Louisiana to cost share with the federal government on wetlands improvements. This multiplies the effectiveness of state money spent by matching federal funds through the Coastal Wetlands, Planning, Protection, and Restoration Act (CWPPRA), or Public Law 101-646;

The Coastal Management Division (CMD) of the Louisiana Department of Natural Resources is charged with implementing the Louisiana Coastal Resources Program (LCRP) under the authority of the State and Local Coastal Resources Management Act (SLCRMA) of 1978. This law seeks to protect, develop, and where feasible, restore or enhance the resources of the state's Coastal Zone. Its broad intent is to encourage multiple uses of the resources and adequate economic growth while minimizing adverse effects of one resource use upon another without imposing undue restrictions on any user. Besides striving to balance conservation and resource use, the policies of the LCRP also help to resolve user conflicts, encourage Coastal Zone recreational values, and determine the future course of coastal development and conservation. The CMD regulates development activities and manages the resources of the Coastal Zone. A Coastal Use Permit (CUP) Program has been established by the Act to help insure the management and reasonable use of the state's coastal wetlands;

Managed 105 employees; interacted with state and federal agencies, and legislators; represented the Governor in Washington D.C. and on advisory panels; officially represented the state on numerous occasions. During tenure, approximately $100 million in contracts handled.

1990. Fairleigh Dickinson University, West Indies Laboratory/ N.O.A.A. National Undersea Research Center joint appointment, St. Croix, U.S. Virgin Islands
Most of my time was spent on an underwater coral reef and platform coring program. Research was funded in part by US National Parks Service.

1987 – 1989. Dawn Diamond Company, South Africa
I was the General Manager (equivalent to President/Principal). This pioneering company was involved in mining marine diamondiferous placer deposits located off the west coast of southern Africa. The company employed 105 persons, 36 of which were professional divers. Three mining vessels were operated year-round, the largest of which was 1800 tons. A 22-foot catamaran was used for geophysical surveying. Responsibilities included managing the company and determining which seabed areas we should mine. The latter

involved very detailed geophysical surveying, primarily side-scan sonar work. This technology was subsequently picked up by all major marine diamond mining companies. At present a very large percentage of diamonds sold on the world market come from marine deposits.

In addition, I performed bottom geological inspections (decompression "hard hat" diving) and grab/airlift sampling. Three months after joining the company, production had risen by 60-fold. This success was due mainly to the interpretation of paleo-marine processes from the response features depicted on the sonographs and the ground truth data obtained through diving. Also, the increased productivity reflected streamlining of the operation and several personal changes.

1985 - 1987. Marine Geoscience Division, National Research Institute for Oceanology, Stellenbosch, South Africa

As Head of the Division I managed a staff of 10 scientists and technicians. Undertook marine surveys and environmental management projects. Some time was spent mapping the continental shelf using a 110 ft research vessel. Other surveys were for the offshore diamond area along the west coast of South Africa and Namibia. Involved in wetland management Greater St Lucia Park and Natal Game Reserves.

1983 – 1985. Environmental Services Group, Specialist Offshore Surveys, Cape Town, South Africa

In charge of all field projects and data processing, plus promoting services to prospective clients. Company turnover doubled after 1 year. Clients included provincial governments and major oil companies.

RESEARCH AND CREATIVE ACTIVITY

I have written three books, about 10 book chapters, 60 scientific papers, 100 scientific reports, and given hundreds of talks.

AGULHAS VENTURES, Inc.

Since 1994 I have managed my own S Corporation involved in environmental management, coastal land loss and remediation, global warming impacts, dredge disposal, levee failure consequences, wind vs surge property damages, environmental damage assessments, and expert witness testimony. I am a consultant to the Atchafalaya Basinkeeper whose mission is dedicated to protecting and restoring the ecosystems within the Atchafalaya Basin for future generations.

EXHIBIT
B

EXHIBIT B:

DOCUMENTS REVIEWED

The following is a list of documents relevant to Buffalo Cove Element 10 that I have reviewed.

1. Environmental Assessment; Atchafalaya Basin Floodway System, Louisiana Project Management Unit Feature; Buffalo Cove Management Unit, Southern Water Circulation Improvements, EA #441, June 2018 (original date of April 2018 redacted); New Orleans District, U.S. Army Corps of Engineers, Regional Planning and Environment Division South.
2. July 18, 2018 Letter to Steve Roberts, US Army Corps of Engineers, Re: Comments on Behalf of Atchafalaya Basinkeeper, Gulf Restoration Network. The Louisiana Crawfish Producers Association-West, and the Delta Chapter of Sierra Club regarding the proposed Buffalo Cove Management Unit – Element 10 and Draft Environmental Assessment (EA #441) for the Atchafalaya Basin Floodway System, Buffalo Cove Management Unit
3. Environmental Assessment, Atchafalaya Basin Floodway System Buffalo Cove Management Unit, Water Circulation Improvements and Sediment Management Initiatives, Iberia and St. Martin Parishes, Louisiana EA #366 (2003)
4. Finding of No Significant Impact, Atchafalaya Basin Floodway System, Buffalo Cove Management Unit, Southern Water Circulation Improvements (Element 10), Environmental Assessment #331, Iberia, St. Martin and St. Mary Parishes (by the Department of the Army, U.S. Army Corps of Engineers, New Orleans District), signed Col. Stephen F. Murphy, August 16, 2020
5. van Heerden, Ivor L. and M. Bryan, The Storm – What Went Wrong and Why during Hurricane Katrina – the Inside Story from One Louisiana Scientist, Publ. Penguin/Viking, New York, New York, 308pp (2006)
6. van Heerden, Ivor L., G. P. Kemp, H. Mashriqui, R. Sharma, et al., The Failure of the New Orleans Levee System during Hurricane Katrina - A report prepared by TEAM LOUISIANA for Secretary Johnny Bradberry, Louisiana Department of Transport and Development (Feb. 12, 2007), https://levees.org/2/wp-content/uploads/2019/05/Team-LA-F26-FINAL-REPORT.pdf
7. Van Heerden, I, Ll. 2018. EXPERT REPORT ON PROPOSED EAST GRAND LAKE PROJECT (EGL) 2nd April 2018. Prepared by Agulhas Ventures, Inc. https://www.basinkeeper.org/research
8. Van Heerden, I. Ll. 2019. REVIEW OF THE COMMENTS OF OTHERS AS RELATES TO THE EGL PROJECT PROPOSED BY THE LOUISIANA DEPARTMENT OF NATURAL RESOURCES. Prepared by Agulhas Ventures, Inc. https://www.basinkeeper.org/research
9. Van Heerden, I Ll, 2020. Atchafalaya Basin Floodway System, Louisiana, Feasibility Study, Main Report and Final EIS, January 1982, US Army Corps of Engineers, Mississippi River Commission, New Orleans District. Prepared by Agulhas Ventures, Inc. https://www.basinkeeper.org/research