

Programmatic Environmental Assessment
and
Proposed Finding of No Significant Impact

for

Implementation of Section 128 of the Water Resources Development Act of 2020
Selection of Recommended Projects

September 2022

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1. PURPOSE AND NEED

The proposed action is necessary to implement the demonstration program as instructed by Section 128 of the Water Resources Development Act of 2020. The US Army Corps of Engineers (USACE), Engineer Research and Development Center (ERDC) solicited Statements of Interest (SOI), established a project review team comprised of interdisciplinary subject matter experts (SMEs) to evaluate SOIs received based upon criteria and considerations provided in the statute, WRDA 2020 Section 128. This programmatic environmental assessment (PEA) describes the environmental effects from funding the SOIs, describes the methodology for evaluating the SOIs, and provides a recommendation for selection and funding of demonstration projects.

1.1 Authority

Section 128 of WRDA 2020 (henceforth simply Section 128, see Appendix A) directs the Secretary to implement a demonstration program to determine the causes of, and implement measures to effectively detect, prevent, treat, and eliminate, harmful algal blooms (HAB) associated with water resources development projects. Section 128 requires the Secretary to consult with and leverage data from Federal and state agencies, and leverage activities of the Secretary carried out through the ERDC pursuant to Section 1109 of the Water Resources Development Act of 2018 (33 U.S.C. 610 note). Additionally, Section 128 authorizes \$25 million to be appropriated to carry out the demonstration program.

1.2 Location

The authority directs the Secretary to undertake program activities in the Great Lakes, tidal and inland waters of New Jersey, coastal and tidal waters of Louisiana, waterways of Sacramento-San Joaquin Delta in California, Allegheny Reservoir Watershed in New York, and Lake Okeechobee, Florida. Section 128 directs the Secretary to undertake program activities related to HABs at any Federal reservoir located in the Upper Missouri River Basin or the North Platte River Basin, at the request and expense of another Federal agency. Preference will be given to these watersheds, but implementation may occur outside these identified watersheds.

1.3 Background

In Fiscal Year 2022 (FY22), \$4M was appropriated to implement this program. The program targets HABs associated with water resource development projects. Cyanobacteria, also called blue-green algae, cause the vast majority of HABs in these fresh water and estuarine systems and are therefore the phytoplankton of interest for this program. Cyanobacteria can produce and release potent neurotoxins, hepatotoxins, cytotoxins, and/or gastrointestinal toxins [1], which directly impact human and wildlife health. Though not all HABs produce toxins, all algal blooms degrade aquatic ecosystems by shading out submerged vegetation, and/or disrupting the aquatic food web. Decay of HAB biomass can cause prolonged decreased in dissolved oxygen (hypoxia), which can cause fish kills and harm benthic macro invertebrate communities [2, 3]. These effects can have negative implications for the USACE water resources development projects and the Nation.

Non-federal entities were invited via Public Notice (Appendix B) to submit SOIs to implement a demonstration project to address a HAB associated with a water resources development project. The ERDC Office of Counsel (OC), in coordination with USACE Headquarters OC, determined whether or not the submitted SOI was authorized for funding under this authority. The ERDC received twenty (20) SOIs for consideration in FY22. This PEA has been developed to analyze the effects to

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the human environment under the National Environmental Policy Act (NEPA) resulting from funding demonstration projects as authorized in Section 128 of WRDA 2020.

2. ALTERNATIVES CONSIDERED AND SCREENING CRITERIA

This section discusses the types of demonstration projects, screening and evaluation criteria, and alternatives developed for this PEA. NEPA regulations require Federal agencies to consider the No Action alternative and a reasonable array of alternatives including the proposed action. The alternatives are discussed in **Section 2.4** below.

2.1. Types of Demonstration Projects

The term demonstration project means implementation of a HAB prevention, detection, or management technology with the primary objective of evaluating and gathering detailed technology cost and performance data that will guide technology use and support technology transfer to field practitioners. The following sections define each demonstration focus area (HAB detection, prevention, and management) and provide examples of technologies and types of demonstrations that may be conducted to provide a basis for assessing potential environmental effects of the program.

2.1.1. Detection Technology

HAB detection includes identification of the type and abundance of cyanobacteria cells present in a water body as well as the type and concentration of associated toxins. Water managers may employ a phased detection approach, utilizing visual or remote sensing-based assessments of water quality indicators (e.g. chlorophyll-a) at the waterbody-scale, followed by discreet water sampling and analysis for cyanobacteria and toxins if a HAB is suspected. The state of the science for early HAB detection [4, 5], remote sensing [6, 7] and toxin analysis [8] continues to advance with support from Federal, state and other research investment. In general, HAB detection technology demonstrations conducted under Section 128 will involve collection and analysis of data within a watershed for the purpose of detection and prediction. Example projects could include use of remote sensing, environmental monitoring, and advanced computer models to generate watershed-scale HAB assessments and predictions; analysis of water samples via rapid, field-based sensors to identify and quantify HAB-causing cyanobacteria and toxins in water samples; and possible deployment of *in situ* sensors capable of real-time analysis and telemetry.

2.1.2. Management Technology

HAB management includes chemical-, physical-, and biological-based means to remove, destroy, or neutralize cyanobacteria cells and the toxins they produce. Each management approach has its advantages and disadvantages [9]. Chemical approaches such as algaecides reduce the abundance of cyanobacteria cells but not always their toxins, dependent on bloom intensity, water quality, treatment dosage rates, sunlight intensity, treatment contact time, etc. [10]. Other chemical oxidation-based treatments include UV light exposure, e.g. on boat mounted and screen-protected chambers [11]; ozone, which can be delivered into waterways via microbubbles [12] or nanobubbles [13]; and reusable materials impregnated with photoreactive catalysts like TiO₂, which has potential to neutralize cyanobacteria cells and toxin when activated by natural or artificial UV light [14, 15] or ultrasound [16]. Physical approaches involve addition of flocculants to sink cyanobacteria cells out of productive water column depths [17] or

use of floating booms or curtains to restrict cyanobacteria migration toward protected areas or to facilitate skimming and removal of cyanobacteria from water. For example, the USACE-developed HAB Interception Treatment and Transformation Systems (HABITATS) collects and treats HAB-impacted water, concentrates the HAB biomass, then transforms the biomass into biofuel via hydrothermal liquefaction [18, 19]. Another approach involves use of buoy-deployed ultrasonic devices, which can release soundwaves tuned to disrupt cyanobacteria cells [20]. Biological HAB management approaches vary widely in their mechanism and maturity level. Controlling predatory fish populations to increase abundance of large-bodied Daphnia, which feed on cyanobacteria, has shown promise for suppressing some but not all HAB-forming cyanobacteria populations in eutrophic lakes [21]. Other biomanipulation methods (aquatic ecosystem restoration, addition of non-harmful competitors, etc.) have been applied for HAB management as well [22]. Less mature technologies include gene silencing agents, which are compounds that bind to specific cyanobacteria genes to disrupt growth and activity [23], and use of cyanophage, which are cyanobacteria-specific viruses capable of infecting and weakening cells and potentially preventing blooms [24]. Bioremediation involves use of bacteria capable of degrading toxins [25, 26] as well as use of their free enzymes, which are capable of transforming cyanotoxins and reducing their toxicity [27]. Example projects conducted under Section 128 could feature use of technologies described above, either alone or in combination, for the purposes of HAB management.

2.1.3. Prevention Technology

HAB prevention can include optimizing hydraulic conditions (in managed waterbodies) and limiting nutrient availability to prevent onset of HAB-favorable conditions or even preventative cyanobacteria treatments. Water managers may in some cases have flexibility to modify operations to minimize HAB-favorable conditions while still meeting operational discharge requirements; the USACE-ERDC developed “Operational Dashboard” will support operations decision making to this end [23]. Nutrient influx during large rainfall events, followed by periods of drought, high temperatures, and low water levels with associated increased residence times and sunlight penetration depth, create ideal conditions for cyanobacteria HAB formation. Excellent ongoing nutrient reduction- and nutrient retention-focused programs led by partner agencies (e.g. Ohio Environmental Protection Agency, U.S. Department of Agriculture, others) will reduce new nutrient inputs to waterbodies; however, legacy nutrients in sediment can potentially fuel cyanobacteria HABs for decades after new inputs have been controlled. Binding agents (e.g. Phoslock®) may effectively limit nutrient availability long after application [28] but can be costly depending on scale and potential need for repeated application. Preventative HAB treatments can involve application of technology described in **Section 2.1.2** but early and prior to formation of high cyanobacteria cell densities and associated HAB scums. USACE-ERDC is investigating algaecide treatment of cyanobacteria cells that overwinter in sediment to reduce their abundance in sediment and thereby reduce their likelihood of “seeding” subsequent HAB events [29]. Other HAB prevention approaches include floating wetlands for nutrient removal, application of barley straw, and circulation or other means to prevent onset of HAB-favorable conditions [30]. Example projects conducted under Section 128 could feature use of technologies described above, either alone or in combination for the purposes of HAB prevention.

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2.2. Selection Process

Demonstration projects will be chosen to receive funding based upon information provided under **Section 2.3** below and Paragraphs 4.b.(2) through 4.b.(4) of the Implementation Guidance for Section 128 of WRDA 2020, Harmful Algal Bloom Demonstration Program (Appendix C). Projects that feature scalable technology and do not exceed a \$5M per project limit will have preferential weighted scores though larger projects will also be considered based on the merits provided in **Section 2.3** below. ERDC published a public notice (Appendix B) soliciting SOIs from interested parties including direction to include sufficient information in the SOI to demonstrate eligibility per **Section 2.3**. Demonstration projects implemented under this program will be limited in size, duration, and are temporary.

2.2.1. Selection Team

The Director of ERDC established a HAB Demonstration Project Review Team to evaluate SOIs and select the demonstration projects. The Review Team consisted of personnel from the following areas:

- Members of the Invasive Species Leadership Team
- USACE personnel with expertise in the implementation of environmental scientific principles including invasive and nuisance species science and management
- Members from the HAB and Hypoxia Research and Control Act Interagency Working Group
- ERDC, Civil Works Office of the Technical Director for Environmental Sciences and Engineering who execute the Aquatic Nuisance Species Research Program

2.2.2. Selection Consideration

Projects will be selected for funding based on the following considerations:

- Potential to significantly reduce the frequency and effects of HABs associated with water resources development projects
- Utilization of new, innovative methods, tools, or technology being developed under the WRDA 2018 Section 1109-authorized HAB Technology Demonstration Program
- Degree to which the project leverages existing Federal and state data and ongoing programs and activities of said agencies
- Preference will be given to projects that address HAB with a water resources development project within one of the six priority watersheds identified in **Section 1.2**

2.2.3. Selection Assumptions

- Demonstration projects will be able to obtain all appropriate state and local permits
- Demonstration projects will take measures to minimize effects to fish, wildlife, threatened and endangered species and associated habitats
- Demonstration projects will not take listed species or permanently modify (in the negative) protected habitats

2.3. Eligibility Criteria

A Section 128 demonstration project may be implemented anywhere in the nation to address a HAB associated with a water resources development project. Preference will be given to projects located in the six focus areas listed in **Section 1.2** and additional focus areas should they be added in future Section 128 amendments. The proposed project must be for the purpose of determining the causes

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of, and/or applying technologies to effectively detect, prevent, manage, or eliminate, HABs associated with a water resources development project. The project must include the gathering and evaluation of technology cost and performance data that will guide use and support technology transfer. The proposed project should also leverage existing Federal and state data and ongoing programs and activities of Federal and state agencies.

The proposed demonstration project should provide data that could be applied, and expanded at a larger scale, at multiple water resources development projects or federally constructed reservoirs. Technology developed by the Corps of Engineers under Section 1109 of WRDA 2018 (Freshwater Harmful Algal Bloom Research and Development Initiative) or viable technology with legal authority and ability to be permitted and applied under appropriate Federal laws.

2.4. ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.4.1. Alternative 1: No Action.

No implementation of HAB demonstration projects. The no action alternative is not feasible due to the legislative requirements of Section 128 of WRDA 2020.

2.4.2. Alternative 2: Selection of SOIs within scope of legislation (Proposed Action).

Selection of SOIs for funding of demonstration projects. The SOIs funded will be selected using the criteria of the statute as outlined in **Section 2.2** above to develop the science and understanding of HABs based on the priorities of the legislation. The proposed action is the alternative selected as it meets the legislative requirements of Section 128, is feasible, and may be implemented within the parameters of the statute.

2.4.3. Alternative 3: Selection of SOIs outside of scope of legislation.

Selection of SOIs that do not meet the criteria outlined in **Section 2.2** or are unable to meet other assumptions. Selection of SOIs outside the scope of the legislation would require additional authorization to federally fund for implementation as well as additional project-specific NEPA analyses. This alternative is possible but would not meet the intent of the statute nor does the USACE have the authority to fund a HAB demonstration project which does not meet the criteria.

3. AFFECTED ENVIRONMENT

This section describes the environment of the area to be affected or created by the alternatives under consideration. The factors of the human environment that are typically assessed under NEPA include but are not limited to land use, historic properties, aesthetics, noise, public infrastructure, socioeconomics, recreation, navigation, floodplains, hydrology, soils, air quality, invasive species, and hazardous, toxic, and radioactive waste. The above factors were considered in the development of this document but are not discussed in detail due to negligible effects amongst all alternatives. For example, land use and related characteristics (historic properties, aesthetics, noise, public infrastructure, socioeconomics) will not be impacted as demonstration project activities will occur in water, with limited and temporary land-based activity including water access and equipment staging. Impacts to authorized water resources development project purposes (recreation, navigation) will be minimized through coordination with the hosting USACE District or other Federal partner. Other effects on the environment (floodplains, hydrology, soils, air quality, invasive species) will be minimal as projects will be temporary, will not involve land improvements, and will be conducted in compliance with

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environmental regulations and policies. Projects will not involve or be conducted at sites featuring hazardous, toxic, and radioactive wastes. The following subsections describe those resources (fish and wildlife sources including threatened & endangered species habitat, aquatic resources including aesthetics and recreation, and environmental justice) to be most directly affected by the proposed action.

3.1. AQUATIC RESOURCES

The HAB demonstration projects could potentially affect both freshwater and estuarine aquatic habitats under the USACE area of responsibility. The USACE manages vast freshwater resources and waterways that provide a variety of services including navigation, flood risk management, hydropower, recreation, fish and wildlife management, as well as potable water supply to the Nation. The USACE has over 400 lake and river projects in 43 states which provide a diverse range of recreational opportunities such as swimming, fishing, and boating as well as fish and wildlife management and potable water supply. HABs occur throughout the Nation in both freshwater and estuarine habitats across scales (e.g. small waterbodies to river reaches), ecoregions (e.g. subtropical Florida to temperate Ohio and New York), and system types (e.g. reservoirs, riverine, lakes, estuaries). HABs negatively affect the aesthetics of aquatic resources due to coloration of the water, smell, and potential to cause fish kills as described earlier (**Section 1.3**).

Potential health concerns associated with HABs could be increased by transfers of water from reservoirs and riverine systems when HABs are occurring in freshwater systems by transferring blooms to the estuaries; or, when HABs are occurring in the estuaries, by increasing nutrient loads and contributing to optimal salinity conditions for blooms to flourish. The transfers of water from reservoirs to riverine or estuarine systems are generally governed by the operations manual for each specific project and are dependent upon the project purpose (e.g. hydropower, flood risk management, water supply, etc).

Algal blooms, including HABs, are affected by environmental factors including physical and chemical categories [31]. Physical properties of reservoirs and freshwater systems within the USACE area of responsibility are influenced by factors such as residence time, stratification, shading, and temperature [32]. These factors are different in rivers, natural lakes, and reservoirs due to the geomorphological characteristics of each ecosystem. Stratification occurs most noticeably in lakes and reservoirs due to their moderate to high mean depths. Residence time of water is greater in lakes and reservoirs over riverine systems. Turbidity is generally greater at this transition between the riverine system and the reservoir, with sediments and nutrient loads generally dropping out of the water column due to decreased water velocities. Algal blooms are more likely to occur in systems with longer residence time due to algal growth occurring at a rate greater than the water is moving through the system. Flushing, or the movement of water, in an aquatic ecosystem can help prevent the accumulation of nutrients, algal growth, and sediments within the aquatic habitat – but flushing can also transfer nutrient-laden water downstream and/or transport phytoplankton upstream to downstream. Releasing freshwater (with potential algal mass) to estuaries during a HAB can result in transport of phytoplankton to the estuaries where blooms can increase with suitable salinities. As noted earlier, transfers of water from reservoirs downstream are governed by project specific operations manuals. Thermal stratification of water allows for algal growth as the phytoplankton can adjust their buoyancy to move within the water column utilizing nutrients and sunlight to maintain optimal growth. Shading of the water body can limit algal growth, but USACE reservoirs are typically large and limited in shading of the water body.

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Chemical factors influencing HAB development include pH of the water body, nitrogen and phosphorus inputs, salinity, and trace metal inputs [32]. For many freshwater HABs, nitrogen and phosphorus loading dominate algal growth, such as in Lake Okeechobee, Florida. Nitrogen and phosphorus concentrations within the aquatic system influence the growth and distribution of cyanobacteria species. Phosphorus is generally the limiting factor in lakes [33, 34] and loading of this nutrient can have the greatest effect on algal blooms as it is typically the least abundant macronutrient in the system. Nitrogen and phosphorus loading to water resource development projects in the USACE area of responsibility are generally a result of overland runoff from human activities such as farming and fertilization of lawns.

Some USACE water resource development projects connect to estuarine systems such as tidal and inland waters of New Jersey, coastal and tidal waters of Louisiana, waterways of Sacramento-San Joaquin Delta in California, and the Caloosahatchee and St. Lucie estuaries from Lake Okeechobee. Estuarine habitats provide recreation, fishing, and aesthetic values as well. The estuarine habitat is the connection between the freshwater ecosystem (rivers and streams) and marine environment and includes unique plant and animal species that have acclimated to the mixing of fresh and salt water and are generally very productive ecosystems.

3.2. FISH AND WILDLIFE

Water resource development projects in the USACE area of responsibility include many different species of fish and other wildlife such as birds, reptiles, and mammals. Due to varied environments in which HABs occur throughout the Nation, an individual description of all possible fish and wildlife resources is not included in this PEA. Suitable habitat for the species of interest includes riverine systems, lakes and reservoirs, downstream estuaries, and the upland areas adjacent to the aquatic habitats. There is also suitable habitat for threatened and endangered species throughout the USACE area of responsibility. The occurrence of threatened and endangered species within and adjacent to water resource development projects is expected. Information on the most up to date threatened and endangered species lists by state can be found at the following location: <https://ecos.fws.gov/ecp/report/species-listings-by-state-totals?statusCategory=Listed>. Species and critical habitat information available at this website is incorporated by reference into this document.

3.3. ENVIRONMENTAL JUSTICE

The minority and low-income populations within the USACE area of responsibility of interest in the project are those located along waterways and adjacent to reservoirs, often in urban areas. Population specific information can be found <https://www.epa.gov/ejscreen> for areas adjacent to specific water resource development projects. In addition, the beta version of the Climate and Economic Justice Screening Tool can be used to identify environmental and climate challenges and realities that communities are experiencing as part of the Federal decision-making process. This tool can be found at the following link: <https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5>. Information available at both of these websites is incorporated by reference into this document.

4. ENVIRONMENTAL CONSEQUENCES

This section forms the scientific and analytic basis for the comparison of alternatives, including the proposed action and the significance of those impacts to the factors described in **Section 3**. Detection demonstration projects are expected to have no effects to the resources identified as these would generally include use of remote sensing, environmental monitoring, and advanced computer models. Further, the demonstration projects implemented under this program will be limited in size, duration,

and are temporary. Potential affects from the projects are also expected to be limited and temporary in line with the duration described in the selected SOIs.

4.1. AQUATIC RESOURCES

4.1.1. Alternative 1: No Action.

Implementation of the No Action Alternative would have continued negative effects to the aquatic environment described in **Section 3.1**. Conditions would remain the same moving forward with HABs continuing to occur in USACE water resources development projects and downstream estuaries. Negative effects to water resource development project uses (recreation, aesthetics, potable water supply, etc) would continue due to HABs, likely worsening due to climate change (e.g., increased rainfall intensity, general warming) leading to erosion and influx of nutrients from adjacent lands. Current state and local efforts for HAB detection, management, and prevention would occur consistent with state and local guidance and commensurate with state and local funding, but no additional Federal action for HAB detection, management, and prevention would occur.

4.1.2. Alternative 2: Selection of SOIs within scope of legislation (Proposed Action).

SOIs funded for implementation would provide benefits to the aquatic environment by reducing HABs within the demonstration project footprints. Implementation of the HAB demonstration projects would allow for evaluation and gathering of detailed technology cost and performance data that will guide technology use and support technology transfer to field practitioners to provide benefits to the human environment with future reductions in HABs. Management of USACE water resource development projects could integrate these tools to reduce the potential for HABs and subsequent effects to project users. Though recreation may be limited for the duration of the HAB demonstration projects, these effects would be short term in nature with long term benefits of future prevention and management of HABs.

Selection for Federal funding of a demonstration projects would require compliance by the grantee of the Clean Water Act (CWA) (Sections 401, 402, and 404 as appropriate) as well as the Safe Drinking Water Act (SDWA) at minimum (e.g. grantee would acquire appropriate state/Federal permits). SOIs funded for implementation would also acquire any additional local permits required to implement their demonstration project to protect the environment and users of the aquatic resources.

4.1.3. Alternative 3: Selection of SOIs outside of scope of legislation.

Selection and funding of demonstration projects that either do not meet the requirements of the authorizing legislation or are not able to obtain CWA and SDWA permits would require independent NEPA analysis and documentation to ensure the projects will not significantly affect the human environment. Projects that do not meet the requirements of the authorizing legislation would also need to obtain specific authorization for use of Federal funding. If selected, this alternative could negatively affect the aquatic environment as these demonstration projects would not be federally funded in a timely manner. Conditions would remain the same moving forward with HABs continuing to occur in water resources development projects and downstream estuaries. Both freshwater and estuarine habitats could suffer increased exposure to HABs and degradation of water quality due to loss of light penetration, lowered dissolved oxygen, and HAB toxins preventing use of the water for recreation, potable water, and fishing. These negative effects would continue in the future due

to HABs, likely worsening due to climate change (e.g., increased rainfall intensity, general warming) leading to erosion and influx of nutrients from adjacent lands. Current HAB detection, management, and prevention would occur consistent with state and local guidance and commensurate with state and local funding, but no additional Federal action for HAB detection, management, and prevention would occur.

4.2. FISH AND WILDLIFE

4.2.1. Alternative 1: No Action.

Implementation of the No Action Alternative would have negative effects to fish and wildlife described in **Section 3.2**. Conditions would remain the same moving forward with HABs continuing to occur in USACE water resources development projects and downstream estuaries. Negative effects to fish and wildlife and their habitat would continue due to HABs, likely worsening due to climate change (e.g., increased rainfall intensity, general warming) leading to erosion and influx of nutrients from adjacent lands. Current HAB detection, management, and prevention would occur consistent with state and local guidance and commensurate with state and local funding, but no additional Federal action for HAB detection, management, and prevention would occur. Continued occurrences of HABs in aquatic ecosystems could degrade fish and wildlife habitat to a point in which it causes a decline in the flora and fauna in the surrounding areas.

4.2.2. Alternative 2: Selection of SOIs within scope of legislation (Proposed Action).

Implementation of the HAB demonstration projects would allow for evaluation and gathering of detailed technology cost and performance data that will guide technology use and support technology transfer to field practitioners to provide benefits to the human environment with a likely reduction in HABs. It is expected SOIs funded for implementation would have minimal effects to fish and wildlife due to the selection criteria used to screen and select, as well as the requirement to comply with the CWA and SDWA. Use of chemicals or other technologies discussed in **Sections 2.1.2** and **2.1.3** are expected to have minimal effects to the environment at the scales they will be implemented (limited in geographic extent and temporary). Selection for funding of a demonstration project would require compliance by the grantee of the CWA (Sections 401, 402, and 404 as appropriate) as well as the SDWA at minimum. SOIs funded for implementation would also acquire any additional local permits required to implement their demonstration project to protect the environment and users of the aquatic resources.

4.2.3. Alternative 3: Selection of SOIs outside of scope of legislation.

Selection and funding of demonstration projects that do not meet the requirements of the authorizing legislation or are not able to obtain CWA and SDWA permits would require independent NEPA analysis and documentation to ensure the projects will not significantly affect the human environment. Projects that do not meet the requirements of the authorizing legislation would also need to obtain specific authorization for use of Federal funding. If selected, this alternative could affect fish and wildlife as these demonstration projects would not be federally funded in a timely manner or implemented in USACE water resource development projects. Conditions would remain the same moving forward with HABs continuing to occur in USACE water resources development projects and downstream estuaries. Fish and wildlife and their associated habitats could suffer increased exposure to HABs and degradation of water quality due to loss of light penetration, lowered dissolved oxygen, and HAB toxins. These negative effects would continue due to HABs, likely worsening due to climate

change (e.g., increased rainfall intensity, general warming) leading to erosion and influx of nutrients from adjacent lands. Current HAB detection, management, and prevention would occur consistent with state and local guidance and commensurate with state and local funding, but no additional Federal action for HAB detection, management, and prevention would occur.

4.3. ENVIRONMENTAL JUSTICE

4.3.1. Alternative 1: No Action.

Implementation of the No Action Alternative would affect low income or minority populations as no demonstration projects would be funded to detect, manage, or prevent HABs in USACE water resource development projects. Conditions would remain the same moving forward with HABs continuing to occur in USACE water resources development projects and downstream estuaries and these populations could suffer increased exposure to HABs through fishing, boating, and use of waters with HABs. Negative effects would continue due to HABs, likely worsening due to climate change (e.g., increased rainfall intensity, general warming) leading to erosion and influx of nutrients from adjacent lands. These populations are often less mobile due to lower income than higher income populations; therefore, as HABs continue, these populations will likely be more affected by HABs than higher income populations. Current HAB detection, management, and prevention would occur consistent with state and local guidance and commensurate with state and local funding, but no additional Federal action for HAB detection, management, and prevention would occur.

4.3.2. Alternative 2: Selection of SOIs within scope of legislation (Proposed Action).

Implementation of the HAB demonstration projects would allow for evaluation and gathering of detailed technology cost and performance data that will guide technology use and support technology transfer to field practitioners to provide benefits to the human environment with a likely reduction in HABs. Selection and funding of the demonstration projects would require compliance by the grantee of the CWA (Sections 401, 402, and 404 as appropriate) as well as the SDWA at minimum. SOIs funded for implementation would also acquire any additional local permits required to implement their demonstration project to protect the environment and users of the aquatic resources due to a temporary reduction in exposure to HABs.

4.3.3. Alternative 3: Selection of SOIs outside of scope of legislation.

Selection and funding of demonstration projects that do not meet the requirements of the authorizing legislation or are not able to obtain CWA and SDWA permits would require independent NEPA analysis and documentation to ensure the projects will not significantly affect the human environment. Projects that do not meet the requirements of the authorizing legislation would also need to obtain specific authorization for use of Federal funding. If selected, this alternative could affect low or minority populations as these demonstration projects would not be federally funded in a timely manner or implemented in USACE water resource development projects. Conditions would remain the same moving forward with HABs continuing to occur in USACE water resources development projects and downstream estuaries and these populations could suffer increased exposure to HABs through fishing, boating, and use of waters with HABs. Negative effects would continue due to HABs, likely worsening due to climate change (e.g., increased rainfall intensity, general warming) leading to erosion and influx of nutrients from adjacent lands. Current HAB detection, management, and prevention would occur consistent with state and local guidance and commensurate with state and local funding, but no additional Federal action for HAB detection, management, and prevention would occur.

4.4 CUMULATIVE EFFECTS

The Council on Environmental Quality regulations define cumulative impacts as: the impacts on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-federal) or person undertakes such other actions; cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Implementation of the HAB demonstration projects, when added to other past, present, and reasonably foreseeable actions, would allow for continued gathering and evaluation of data related to detecting, managing, and preventing HABs in aquatic ecosystems, including but not limited to USACE water resources development projects. This would allow for future positive effects to aquatic ecosystems and the fish, wildlife, and human users of the ecosystems. If multiple SOIs are selected for demonstration projects in the same body of water, there could be positive and/or negative synergistic effects of the prevention or management technologies, but it is expected this would be minimal and short-term due to the temporary nature of the demonstration projects.

5. ENVIRONMENTAL COMPLIANCE

This PEA provides for compliance with NEPA for SOIs selected as documented by the Proposed Action (Alternative 2, **Section 2.4.2**). Further, the SOIs funded by Section 128 of WRDA 2020 would require compliance with the Clean Water Act, including Sections 401, 402, and 404, as appropriate prior to implementation. Demonstration projects would have negligible effects to the human environment, as noted in **Section 4**, and therefore would have no effect to species listed under the Endangered Species Act. SOIs selected for funding as documented by the Proposed Action (Alternative 2, **Section 2.4.2**) are required to be in compliance with other laws and Executive Orders (EO) including but not limited to the Magnuson-Stevens Fishery Conservation and Management Act, National Historic Preservation Act, and EO 12898.

6. LIST OF PREPARERS

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7. PROPOSED FINDING OF NO SIGNIFICANT IMPACT

The USACE has conducted an environmental analysis in accordance with NEPA. All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. In compliance with NEPA and its implementing regulations at 40 CFR, Parts 1500-1508, an _____ Environmental Assessment has been prepared for this proposed action. The potential effects were evaluated in **Section 4** of this document.

The USACE prepares appropriate NEPA documentation, including Environmental Impact Statements when required, for actions that might rise to the level of significant impacts on the quality of the human environment. The environmental review process for this proposed action has led me to conclude that selection of the HAB demonstration projects to further implementation of Section 128 of the Water Resources Development Act of 2020 will not have a significant impact on the human environment. Each selected demonstration project will need to demonstrate compliance with the Clean Water Act, including sections 401, 402, and 404 as appropriate prior to implementation. Therefore, preparation of an Environmental Impact Statement is not required by subsection 102(2)(C) of NEPA or its implementing regulations.

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Date _____

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APPENDIX A

SECTION 128, HARMFUL ALGAL BLOOM DEMONSTRATION PROGRAM

a) IN GENERAL. The Secretary shall carry out a demonstration program to determine the causes of, and implement measures to effectively detect, prevent, treat, and eliminate, harmful algal blooms associated with water resources development projects.

(b) CONSULTATION; USE OF EXISTING DATA AND PROGRAM AUTHORITIES. In carrying out the demonstration program under subsection (a), the Secretary shall

(1) consult with the heads of appropriate Federal and State agencies; and

(2) make maximum use of existing Federal and State data and ongoing programs and activities of Federal and State agencies, including the activities of the Secretary carried out through the Engineer Research and Development Center pursuant to section 1109 of the Water Resources Development Act of 2018 (33 U.S.C. 610 note).

(c) FOCUS AREAS. In carrying out the demonstration program under subsection (a), the Secretary shall undertake program activities related to harmful algal blooms in the Great Lakes, the tidal and inland waters of the State of New Jersey, the coastal and tidal waters of the State of Louisiana, the waterways of the counties that comprise the Sacramento-San Joaquin Delta, California, the Allegheny Reservoir Watershed, New York, and Lake Okeechobee, Florida.

(d) ADDITIONAL FOCUS AREAS. In addition to the areas described in subsection (c), in carrying out the demonstration program under subsection (a), the Secretary shall undertake program activities related to harmful algal blooms at any Federal reservoir located in the Upper Missouri River Basin or the North Platte River Basin, at the request and expense of another Federal agency.

(e) AUTHORIZATION OF APPROPRIATIONS. There is authorized to be appropriated to the Secretary \$25,000,000 to carry out this section. Such sums shall remain available until expended.

APPENDIX B

Federal Awarding Agency:

U.S. Army Corps of Engineers,
Engineer Research and Development Center
3909 Halls Ferry Road
Vicksburg, MS 39180-6199

Funding Opportunity Title: Harmful Algal Bloom Field Validation Program: Aquatic Nuisance Species, Broad Agency Announcement Special Topic Area.

Announcement Type: Broad Agency Announcement

Funding Opportunity No: W81EWF-22-HAB-BAA

Assistance Listing No: 12.630

Pre-Proposal due date: 21 June 2022, 1700 CST.

Full Proposal due date, if invited: 15 July 2022.

Harmful Algal Blooms (HABs), which can be caused in freshwater by various cyanobacteria, represent a significant and costly threat to our Nation's economy and natural resources. HABs impact waterways, infrastructure, operations, and associated resources across the Nation. Innovative, cost-effective, and scalable technologies for early detection, prevention, and management of HABs are needed.

This announcement focuses on the field validation of innovative HAB prevention and management technologies, or combinations of technologies, that have been proven at lab or pilot scales. It is essential that these technologies are cost-effective and efficient in varied freshwater system types (e.g. lotic, lentic) and varied climatic ecoregions across our Nation. Proposals that focus extensively on water quality, including impacts to drinking water, are not needed at this time. Proposals that use Unmanned Aircraft Systems (UAS) as a monitoring or surveying method will not be considered.

Projects should match one of the following objectives:

- (1) The project's potential to significantly reduce the frequency and effects of HABs associated with water resources development projects.
- (2) The project's utilization of new, innovative methods or tools, or technology being developed under the Freshwater Harmful Algal Bloom Research and Development Initiative.
- (3) The degree to which the project leverages existing Federal and State data and ongoing programs and activities of Federal and State agencies.
- (4) Preference will be given to projects that address a HAB issue associated with a water resources development project in one of the six focus areas identified in eligibility requirements provided below.

Offerors and pre-proposals must meet eligibility and other requirements as follows:

- (1) *A field validation project may be implemented anywhere in the nation to address a HAB associated with a water resources development project. Preference will be given to projects located in the six focus areas: the Great Lakes, tidal and inland waters of New Jersey, coastal and tidal waters of Louisiana, waterways of Sacramento-San Joaquin*

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Delta in California, Allegheny Reservoir Watershed in New York, and Lake Okeechobee, Florida.

- (2) *The proposed project must be for the purpose of determining the causes of, and/or applying technologies to effectively detect, prevent, manage, or eliminate, HAB associated with a water resources development project. The project must include the gathering and evaluation of technology cost and performance data that will guide technology use and support technology transfer.*
- (3) *The proposed project should provide data that could be applied at multiple water resources development projects or federally constructed reservoirs in the Upper Missouri River Basin or the North Platte River Basin and could be expanded at a larger scale than the proposed demonstration.*
- (4) *The applicants may propose to use technology developed by the Corps under Section 1109 of WRDA 2018 (i.e., the Freshwater Harmful Algal Bloom Research and Development Initiative) or viable technology with legal authority and ability to be permitted and applied under appropriate federal laws.*

The maximum total funding available to award under this announcement in Fiscal Year 2022 is \$4,000,000. The Government may elect to award 2 to 5 proposals from this announcement. Multi-year proposals may be submitted. The Government may elect to award all years for selected projects or only the first year(s) of selected projects, depending on the proposals received and what is determined to be in the Government's best interest. Continuation of field validation efforts beyond 2022 is contingent on additional Congressional funding appropriation.

Pre-proposals should include a brief description of the envisioned project to include a problem statement, project objectives, brief description of tasks to meet objectives, task schedule, and estimated cost per task and year to meet objectives listed. Pre-proposals should be Times New Roman font, 12 point, and no more than 5 pages in length; maximum of 3 additional pages for supplementary information (8 pages total). CVs are not included in the page limit.

Successful proposals will (a) clearly identify question(s) the proposed project will seek to answer (i.e., project technical objectives); (b) clearly describe the tasks and data required to answer those question(s) (i.e., data quality objectives); and (c) describe envisioned project deliverables by task and by year. Successful proposals will identify quantitative and qualitative success criteria for each project task and objective; identification of go/no-go decision points at the end of each year is encouraged. A budget by year and by task is recommended. The full proposal must include a signed SF424 Research and Related (R&R), technical proposal, and budget/cost proposal.

The resulting award(s) from this announcement is intended to be cooperative agreements only. All awards are subject to DoD Research Terms and Conditions, 2 CFR 200 and DoD Grants and Agreement Regulations. For additional proposals related to HABs not covered by this announcement, please check the ERDC Broad Agency Announcement at <https://sam.gov/opp/b5c1a1dc7c754f52a3343dd59cdd85f5/view>

Interested parties can submit a pre-proposal to the Grants Officer at Chelsea.m.whitten@usace.army.mil or through grants.gov no later than 21 June 2022, 1700 central time zone.

APPENDIX C



SACW

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
CIVIL WORKS
108 ARMY PENTAGON
WASHINGTON, DC 20310-0108

1/11/22

MEMORANDUM FOR COMMANDING GENERAL, U.S. ARMY CORPS OF ENGINEERS

SUBJECT: Implementation Guidance for Section 128 of the Water Resources Development Act of 2020, Harmful Algal Bloom Demonstration Program

1. Section 128 of the Water Resources Development Act (WRDA) of 2020 directs the Secretary to implement a demonstration program to determine the causes of, and implement measures to effectively detect, prevent, treat, and eliminate, harmful algal blooms associated with water resources development projects. Section 128 requires the Secretary to consult with and leverage data from Federal and State agencies, and leverage activities of the Secretary carried out through the Engineer Research and Development Center (ERDC) pursuant to Section 1109 of the Water Resources Development Act of 2018 (33 U.S.C. 610 note). Additionally, Section 128 authorizes \$25 million to be appropriated to carry out the demonstration program. The authority directs the Secretary to undertake program activities in the Great Lakes, tidal and inland waters of New Jersey, coastal and tidal waters of Louisiana, waterways of Sacramento-San Joaquin Delta in California, Allegheny Reservoir Watershed in New York, and Lake Okeechobee, Florida. Section 128 directs the Secretary to undertake program activities related to harmful algal blooms at any Federal reservoir located in the Upper Missouri River Basin or the North Platte River Basin, at the request and expense of another Federal agency.
2. This Section is applicable to the Engineer Research and Development Center (ERDC), Headquarters and all Divisions, Districts, and Field Offices of the U.S. Army Corps of Engineers (Corps) with Civil Works responsibilities.
3. The following definitions apply to the Section 128 demonstration program:
 - a. The term "harmful algal bloom" (HAB) means marine and freshwater phytoplankton that proliferate to high concentrations, resulting in nuisance conditions or harmful impacts on marine and aquatic ecosystems, coastal communities, and human health through the production of toxic compounds or other biological, chemical and physical impacts of the algae outbreak. A HAB is "associated with a water resources development project" if the HAB has the potential to
 - (1) be caused or exacerbated by operation of the project; or
 - (2) adversely impact the project's functioning for its authorized purposes.

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b. The term “demonstration project” means implementation of a HAB prevention, detection, or management technology project, with the primary objective of evaluating and gathering detailed technology cost and performance data that will guide technology use and support technology transfer to field practitioners.

c. The term “water resources development project” means a project constructed by the Corps, or by a non-Federal interest in partnership with the Corps, for purposes of navigation, flood or coastal storm risk management, water supply, or ecosystem restoration. A water resources development project may be operated by the Corps or by a non-Federal interest. The term does not include projects constructed under Environmental Infrastructure authorities.

d. The term “non-Federal interest” is defined in Section 221(b) of the Flood Control Act of 1970 (42 U.S.C. 1962d-5b(b)).

4. The following policies and requirements apply to demonstration projects to address HABs associated with water resources development projects:

a. Eligible applicants. Non-Federal interests are eligible to submit Statements of Interest (SOI) to implement a demonstration project to address a HAB associated with a water resources development project. Other non-Federal entities, that do not meet the definition of non-Federal interest and are interested in a demonstration project should contact ERDC at HABDemoPrgm@usace.army.mil for more information. The ERDC counsel will prepare a legal opinion on whether participation is authorized and if a deviation to the process within this guidance is required for partnering with such entity. This legal opinion must be coordinated with Corps Headquarters counsel. In the case of a demonstration project to address a HAB associated with a water resources development project operated by a non-Federal interest, the written consent of the non-Federal interest is required when the proponent of the demonstration project is not the non-Federal interest.

b. Eligibility Criteria. To be eligible for consideration under the demonstration program, a project must meet the following criteria:

(1) A demonstration project under Section 128 may be implemented anywhere in the nation to address a HAB associated with a water resources development project. Preference will be given to projects located in the six focus areas: the Great Lakes, tidal and inland waters of New Jersey, coastal and tidal waters of Louisiana, waterways of Sacramento-San Joaquin Delta in California, Allegheny Reservoir Watershed in New York, and Lake Okeechobee, Florida.

(2) The proposed project must be for the purpose of determining the causes of, and/or applying technologies to effectively detect, prevent, manage, or eliminate, HAB associated with a water resources development project. The project must

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include the gathering and evaluation of technology cost and performance data that will guide technology use and support technology transfer.

(3) The proposed project should provide data that could be applied at multiple water resources development projects or federally constructed reservoirs in the Upper Missouri River Basin or the North Platte River Basin and could be expanded at a larger scale than the proposed demonstration.

(4) The applicants may propose to use technology developed by the Corps under Section 1109 of WRDA 2018 (i.e., the Freshwater Harmful Algal Bloom Research and Development Initiative) or viable technology with legal authority and ability to be permitted and applied under appropriate federal laws.

(5) Demonstration projects will be chosen based upon information provided under paragraph 4.b.(2) through 4.b.(4). Projects that provide scalability and do not exceed a \$5M per project limit will have preferential weighted scores. However, larger projects will be considered based on the merits provided in paragraph 4.b.(2) through 4.b.(4).

c. Cost. A demonstration project implemented at a water resources development project will be carried out at 100 percent Federal expense.

d. Funding mechanisms. Subject to available authorities, the Corps may use a Federal contract, or a grant or cooperative agreement with a non-Federal interest to implement a demonstration project at a water resources development project. For a demonstration project implemented through a Federal contract at a water resources development project operated by a non-Federal interest, the Corps will execute a Memorandum of Agreement (MOA) with the non-Federal interest prior to implementing the demonstration project.

e. Funding Source. Funds to carry out demonstration projects to address HABs associated with water resources development projects will be requested in the Aquatic Nuisance Control Research remaining item in the Operation and Maintenance account.

f. Selection Considerations. Projects will be selected for funding based on the following considerations:

(1) The project's potential to significantly reduce the frequency and effects of HABs associated with water resources development projects.

(2) The project's utilization of new, innovative methods or tools, or technology being developed under the Freshwater Harmful Algal Bloom Research and Development Initiative.

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(3) The degree to which the project leverages existing Federal and State data and ongoing programs and activities of Federal and State agencies.

(4) As stated in Paragraph 4.b(1), preference will be given to projects that address a HAB issue associated with a water resources development project in one of the six focus areas identified.

g. Statements of Interest (SOI). The Director of ERDC or a respective designee will publish a public notice soliciting SOI from interested parties. A SOI must contain sufficient information to demonstrate eligibility under Paragraph 4.(b) and to address the selection considerations in subparagraph 4f. All information provided in a SOI is public information. Therefore, information that is confidential business information, information that should not be disclosed because of statutory restrictions, or other information that a project proponent would not want to appear publicly should not be included in the submittal.

5. The following procedures apply to demonstration projects to address HABs associated with water resources development projects:

a. Upon the appropriation of funds sufficient to initiate the demonstration project program, the HAB Demonstration Program Review Team formed by the Director of ERDC will review and rank all proposals received.

b. The Director of ERDC will establish a HAB Demonstration Program Review Team to evaluate and select demonstration projects. The team may consist of the following:

(1) Members of the Invasive Species Leadership Team.

(2) Corps personnel with expertise in the implementation of environmental scientific principles including invasive and nuisance species science and management.

(3) Members from the Harmful Algal Bloom and Hypoxia Research and Control Act Interagency Working Group.

(4) Personnel from the ERDC, Civil Works office of the Technical Director for Environmental Sciences and Engineering who execute the Aquatic Nuisance Species Research Program.

6. The following policies and requirements apply to demonstration projects at Federal reservoirs under the jurisdiction of another Federal agency in the Upper Missouri River or North Platte River Basins:

a. At any time a Federal agency responsible for operating a Federal reservoir in the Upper Missouri River or North Platte River Basins may request a demonstration project by contacting the Director of ERDC. All requests will be reviewed by the HAB Demonstration Program Review Team.

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b. A demonstration project implemented at a Federal reservoir will be carried out at the full expense of the Federal agency responsible for operating the reservoir. A General Terms & Conditions (GT&C) Agreement and order consistent with the guidance in Engineer Regulation (ER) 1140-2-211, Support for Others: Reimbursable Services, must be executed prior to implementing a demonstration project for another Federal agency. The Federal agency requesting the demonstration project may provide the required funding on a reimbursable basis.

c. A request for a demonstration project at a Federal reservoir may be accepted if the Director of ERDC determines that there are sufficient resources and the capability to perform the work without adversely affecting activities for which the Corps receives appropriations or preexisting obligations to Federal and non-Federal partners.

d. Funds provided by other Federal agencies for a demonstration project at a Federal reservoir in the Upper Missouri River or North Platte River Basins will not accrue toward the authorized program limit and will not be subject to the evaluation criteria in paragraph 4.b. and 4.f.

8. A draft environmental compliance analysis, to include a draft programmatic National Environmental Policy Act document, will be submitted to the Assistant Secretary of the Army for Civil Works (ASA(CW)) for action prior to the acceptance of any solicitation of proposed projects or proposals from other Federal agencies under this demonstration program. Environmental compliance will analyze the impacts to the human environment of the demonstration program as authorized in Section 128.

9. Under no circumstances shall this policy be modified, supplemented, amended, or rescinded, directly or indirectly, nor shall the Corps take action not in accordance with the direction herein, without the express written approval from the (ASA(CW)). This guidance shall be transmitted to the appropriate Corps Division and District Commanders and posted to the Corps' WRDA website within five business days of receipt (written or electronic) from this office. Guidance shall be transmitted and posted as is and without additional guidance attached.

10. Questions regarding this implementation guidance should be directed to Gib Owen, Office of the ASA(CW), at gib.a.owen.civ@army.mil or 703-695-4641.



MICHAEL L. CONNOR
Assistant Secretary of the Army
(Civil Works)

Encl