US Army Corps of Engineers®
Buffalo District

SCOPING INFORMATION

EVALUATING INNOVATIVE HAB CONTROL MEASURES IN PRESQUE ISLE BAY, LAKE ERIE, PA

PRESQUE ISLE BAY, LAKE ERIE, PA

Section 506 of the Water Resources Development Act (WRDA) of 2000, as amended by Section 5011 WRDA 2007

February 2026

U.S. Army Corps of Engineers
Buffalo District
478 Main Street
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CONTENTS

1. INTRODUCTION

The National Environmental Policy Act (NEPA) directs federal agencies to initiate "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to the proposed action." The U.S. Army Corps of Engineers (USACE) are currently conducting a study to determine the feasibility of demonstrating the use of a clay to manage harmful algal blooms (HABs) in lacustrine systems. The potential study areas include four separate sites within Presque Isle Bay, PA, where HAB blooms have been historically observed (Figure 1). A Programmatic Environmental Assessment (PEA) was conducted for the implementation of a HAB Demonstration Program as authorized by Section 128 of the Water Resources Development Act of 2020. A Finding of No Significant Impact (FONSI) was signed on October 25, 2023. USACE has prepared this scoping information to elicit public and agency concerns and comments, clearly define the environmental issues and alternatives that should be examined, and identify any federal, state and local requirements that may need to be addressed in this supplemental EA.

Figure 1: Map of proposed laponite treatment sites in Presque Isle, PA.

2. PURPOSE AND NEED FOR THE PROJECT

2.1. PROBLEM AND NEED FOR ACTION

Severe HABs have been frequently reported in many streams, ponds, and lakes, across the United States with varying extents and intensities. Due to the excess availability of nutrients such as phosphorus within Lake Erie, its tributaries, and stormwater ponds, experience frequent harmful algal blooms during periods of low discharge (Laiveling et. al. 2022). The size and consistency of these blooms of phytoplankton are driven by nitrogen and phosphorus presence in eutrophic waters like those of the Lake Erie eastern basin. HAB events are frequently experienced around Presque Isle Bay, which is offshore of the City of Erie. These HABs create impacts to drinking water, recreation, and the ecosystem, as the phytoplankton that cause these blooms create a cyanotoxin that, in high levels of exposure, can cause skin rashes, toxicity in the liver, and neurological issues. Two of the most prevalent cyanobacterial algae found to cause cyanobacterial HABs (CHABs) in Lake Erie, are *Microcystis* and *Planktothrix* which can create neurotoxic and hepatoxic cyanotoxins that are associated with poisonings of fish, wildlife, and human populations (U.S. National Office of HAB 2019). Additionally, these HAB events have the potential to impact local supplies of potable water. Thus, preventing, managing and/or minimizing the magnitude and frequency of these HAB events is of primary importance for this region of Pennsylvania.

Princeton Hydro, LLC (PH) is an environmental and engineering consulting company that works on a variety of water resources issues throughout the Mid-Atlantic and New England regions of the United States. One of the key issues that PH focuses on is the monitoring, management and prevention of HABs, from both a watershed-based and in-water perspective. PH is particularly interested in innovative control and prevention strategies that do not rely on the standard pesticide approach, such as the application of copper-based algicides.

CHAB control by clay flocculation is the most globally widespread method of CHAB mitigation in marine environments. Over the past 30 years, the clay-based method has been used to remove algal cells from mostly coastal areas in many countries, including China, Japan, South Korea, Australia, and the United States. The application of clays has not received much attention in treating CHABs in freshwaters in the United States. If correctly applied, clay technology has potentially high CHAB and toxin removal efficiency. The Woods Hole Oceanographic Institution, a leading US oceanographic institution, advocates using clay technology to mitigate CHABs (Devillier et al., 2023). When clay is sprayed into the contaminated water, it causes cyanobacterial cells to flocculate or aggregate and sink to the bottom. The clay technology is appealing because it can have high removal efficiency of HABs, low cost, easy to source and transport, scalable over large areas, and has documented low environmental impacts (Devillier et al., 2023). Understanding CHAB dynamics with ecological insights is also crucial for the successful management of CHABs in freshwater systems. If uncontrolled, the presence of HABs can negatively affect freshwater ecosystems as well as terrestrial ecosystems that rely on the effected water. The presence of HABs within waterways that are used by cities, towns, and/or municipalities may prevent the use of the waterway as a source of freshwater or recreation.

2.2. PROPOSED PROJECT

This study aims to evaluate if innovative treatments, using the non-pesticidal clay product laponite, can control near-shore HABs by physically dragging cyanobacteria cells to the sediments thereby promoting the natural decomposition of cyanobacteria cells and cyanotoxins. This study is demonstrating the feasibility and efficiency of clay technologies to manage and remove freshwater HABs. Synthetic hectorite clay nanomaterial, laponite, has high transparency, low cost, does not require chemical modifications, and can co-coexist harmoniously with living organisms or systems without causing any toxicity or harm (e.g., Khoshakhlagh 2022). The laponite crystals are disk-shaped nanoparticles with a diameter of about 20 nm and a thickness of about 1 nm. Due to laponite's smaller particle sizes than other clays, laponite presents an appealing solution for potentially managing HABs. Based on previous laboratory investigations (Li and Yang 2024), this project proposes to evaluate the removal efficiency of laponite under field conditions within Lake Erie to HABs-forming cells, toxins, and cell metabolic activities.

2.3. STUDY AUTHORITY

Section 128 of the Water Resources Development Act (WRDA) 2020, directs the Secretary of the Army (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 federal and state agencies, and leverage data and activities of the Secretary carried out through the U.S. Army Corps of Engineers (USACE) Engineer Research and Development Center (ERDC) pursuant to Section 1109 of the WRDA of 2018 (33 U.S.C. § 610).

3. PROPOSED ACTIONS

3.1. SITE SELECTION

Presque Isle Bay is a natural bay located off the coast of Erie, Pennsylvania. The 5.8-square-mile embayment is about 4.6 miles in length, about 1.8 mi across at its widest point, and an average depth of about 20 feet. It is bounded on the north and west by a peninsula that makes up Presque Isle State Park. On the south, the bay is edged by the urban Erie shoreline, which hosts the Port of Erie Marine Terminal, as well as an assortment of parks, tourist attractions and marinas such as the Erie Yacht Club. This sheltered natural bay is a popular recreation spot for many water-based activities. A channel on the east provides a shipping lane into and out of Lake Erie from the Port of Erie.

Four near-shore locations have been identified for the proposed treatments (Figure 1). Each location is known to experience HABs over the summer season and will be treated with laponite at a dosage rate of 0.05 mg/L (as per Li and Yang 2024). The four locations and associated surface areas include: Dobbins Landing, 5 acres (Figure 2); a popular tourist location located in Presque Isle Bay at the end of State Street in Erie, PA, overseen and managed by the City of Erie, and located within Presque Isle Bay and known to experience HABs over most of the summer. East Avenue Boat Launch (Figure 3), 6 acres; owned, operated and maintained by the

Erie Western PA Port Authority, this is the only site located on the main body of the lake and not the Bay, and it tends to experience HABs at the height of summer. Erie Yacht Club (Figure 4), 8 acres; privately owned and popular marina located in Presque Isle Bay and known to experience HABs over most of the summer. Liberty Park (Figure 5), 15 acres; Owned by the Erie Port Authority who also schedules onshore events and gatherings located in Presque Isle Bay and known to experience HABs over most of the summer. Each site will have either six or ten sampling stations, with an equal number of laponite and control stations established for water monitoring purposes. Control sites will be established outside of the treatment area.

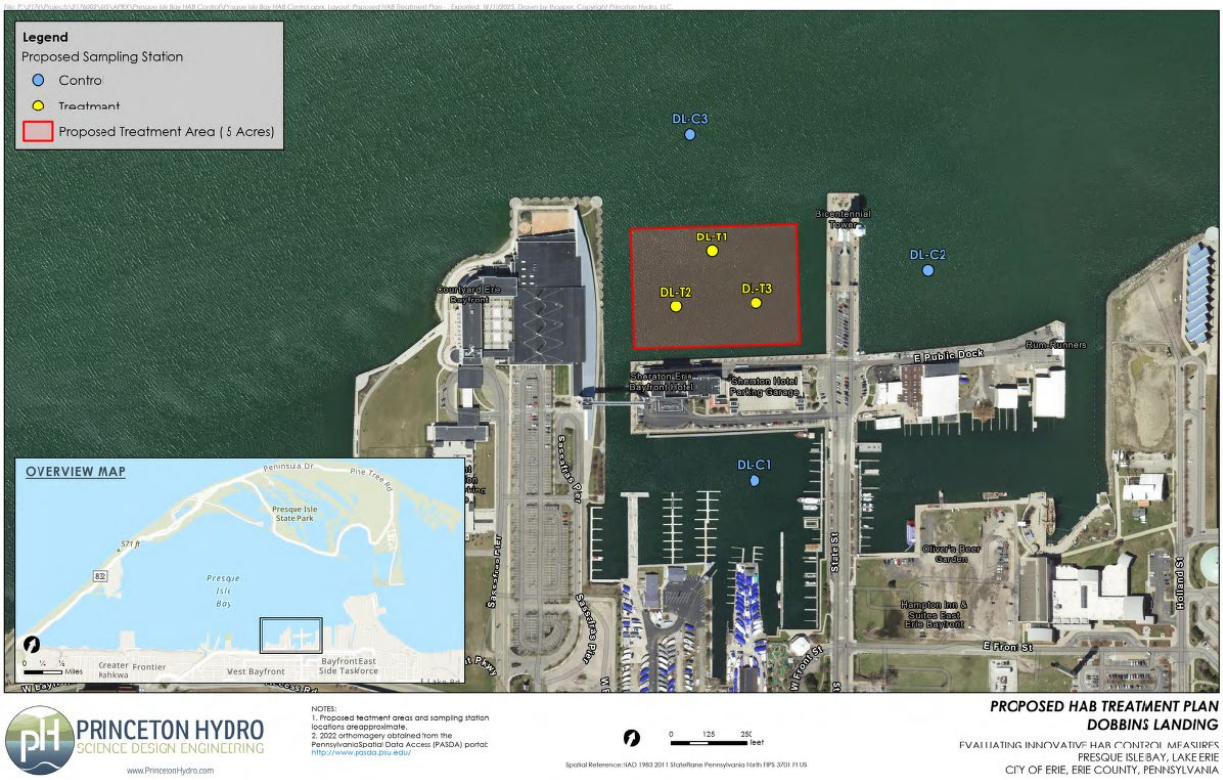

Figure 2: Map of proposed study site at Dobbins Landing, PA (Map created by Princeton Hydro LLC.).

Figure 3: Map of proposed study sites at East Avenue Boat Launch, PA (Map created by Princeton Hydro LLC.).

Figure 4: Map of proposed study sites at the Erie Yacht Club, Erie, PA (Map created by Princeton Hydro LLC.).

Figure 5: Map of proposed study sites at Liberty Park, Erie, PA (Map created by Princeton Hydro LLC.).

3.2. ALTERNATIVES CONSIDERED

No Action Alternative: The USACE is required to consider the "No Action" alternative to comply with USACE policy and the requirements of NEPA. No action assumes that no project would be implemented by the federal government or by the researchers to achieve the planning objectives. No action, which is synonymous with the Without Project Condition, forms the basis from which all other alternative plans are measured. Under this alternative, the federal government would do nothing to address the need for management

Alternative 2: Researchers with PH, aim to study the efficacy of physical (synthetic clays) removal methods for HABs in a lacustrine system. Sedimentation with clay-based materials has been adopted for this project due to its potential for instant removal of HABs and its potential to have little to no negative effects on organisms and systems at targeted locations. The clay used specifically for this study includes a synthetic clay known as laponite. The study will include four locations within the Presque Isle area, as described previously. Each site will have either six or ten sampling stations, with an equal number of laponite and control stations established for water monitoring purposes. Control sites will be established outside of the treatment area. For each project site, a total of five sampling events will be conducted (pre-treatment, immediately aftertreatment, and then 1 day, 1 week, and 1 month after treatment). Discrete samples will be collected from the surface and immediately over the sediments at each sampling site for the analysis. Pre-treatment sampling, application, and post-treatment sampling of these treatments will be conducted during 2026. Samples will be collected from the treatment and control stations at each treatment area in the spring of 2026 to identify overwintering populations of

cyanobacteria. All samples will be incubated at a standard temperature and light of approximately 25.0 °C and 3,200 lux. The light cycle will be set at 12 hours light and 12 hours dark. Data will be collected after 7 and 14 days of incubation to assess the cyanobacteria that may bloom from overwintering cells present in the sediment. The pre-treatment incubation studies will be conducted between late winter and early spring 2026 and the post-treatment incubation studies will be conducted in Fall 2026. Pre- and post-treatment incubation studies will be conducted in a reach-in Darwin Chamber ® with sediment and water collected from the same stations as the field data collection. A total of 280 samples will be analyzed for the 4 sites over 5 sampling events to analyze cyanotoxins, and 140 samples (4 sites over 5 sampling events) will be collected at the water/sediment interface. PH will also conduct the bathymetric assessments using two distinct techniques that will be combined to create a complete survey of the project area; the techniques include use of a calibrated sounding rod and a dual frequency sounder. The amount of clay needed for application will be at a rate of 0.05 mg/L of laponite (Li and Yang 2024). An existing treatment vessel owned by PH will be used for the application of the laponite in the treatment areas; the existing vessel includes a drop seeder structure with an agitator lever or slide to allow for adjustments of application rates and to prevent blockages. Using such a proposed system would keep dust levels to a minimum and allow the laponite to quickly make contact with the surface water. Such a system would allow for uniform and continuous coverage over the surface water and extending the sides of the hopper would minimize potential wind backflow.

4. PUBLIC PARTICIPATION AND INTERAGENCY COORDINATION

Throughout the scoping process, stakeholders and interested parties are invited to provide comment on this study. Potential social, economic and environmental benefits and adverse impacts that may result from each alternative that is selected for detailed analysis will be addressed in future documentation. Interested parties are welcome to contact USACE to discuss their views and recommendations regarding this study. Comments will be accepted by mail/email until the close of this scoping period on March 6, 2026. A supplemental environmental assessment (EA) will be completed to document the evaluation of any potential social, economic, and environmental benefits and potential adverse impacts that may result from the proposed action.

5. IMPACT ASSESSMENT

Future conditions and anticipated potential effects of the proposed action will be assessed and compared to a no action alternative. The no action alternative represents the anticipated condition that may result from Princeton Hydro, LLC., taking no action to complete the demonstration. The alternatives will be evaluated for several social, economic, and environmental categories, including:

- Fish and Wildlife Resources
- Historic Properties
- Water Quality
- Property Values and Tax Revenues

• Dredged Material Management
• Employment
• Geology and Soils
• Community Cohesion and Growth
• Contaminated Materials
• Transportation
• Air Quality
• Public Facilities and Services
• Noise
• Aesthetics
• Recreation

6. COMPLIANCE WITH ENVIRONMENTAL PROTECTION STATUTES

Federal environmental protection statutes that will be addressed are listed below, with additional potentially applicable public laws, executive orders, and policies listed below:

- *National Environmental Policy Act (NEPA)*. In accordance with the Council on Environmental Quality's "Regulations for Implementing the Procedural Provisions of the NEPA of 1969" (40 CFR 1500-1508) and Engineer Regulation 200-2-2 (Procedures for Implementing NEPA), A PEA was conducted for the implementation of a HAB Demonstration Program as authorized by Section 128 of the Water Resources Development Act of 2020. A FONSI was signed on October 25, 2023. USACE will assess the potential environmental effects of the proposed action on the quality of the human environment. Using an interdisciplinary approach, an assessment will be made of the potential environmental impacts of the proposed action(s) by comparing the plans with the "without-project" conditions. The impact assessment process will determine if an environmental impact statement is required, or if an supplemental EA/FONSI is appropriate.

- In accordance with the Council on Environmental Quality's "Regulations for Implementing the Procedural Provisions of the NEPA of 1969" (40 CFR 1500-1508) and Engineer Regulation 200-2-2 (Procedures for Implementing NEPA), the USACE will assess the potential environmental effects of the proposed action on the quality of the human environment. Using an interdisciplinary approach, an assessment will be made of the potential environmental impacts of the proposed action(s) by comparing the plans with the "without-project" conditions. The impact assessment process will determine if an environmental impact statement is required, or if an environmental assessment and finding of no significant impact is appropriate.

- *Clean Water Act.* The project will be evaluated in accordance with the guidelines promulgated by the Administrator of the U.S. Environmental Protection Agency in conjunction with the Secretary of the Army under the authority of Section 404 of the Clean Water Act (40 CFR 230). The proposed federal action will not result in the discharge of dredged or fill material into a water of the United States, thus a Section

404(a) public notice a water quality certification under Section 401 of the Act is not required.

Endangered Species Act. In accordance with Section 7 of this Act, USACE is requesting information from the USFWS on any listed or proposed species or designated or proposed critical habitat that may be present in the project area. The USFWS IPaC website indicates that there is one federally endangered species, two proposed federally threatened species, and one proposed experimental (Non-essential) species listed as being present in or around the potential study areas (Table 1).

The results of a review of the USFWS Information for Planning and Consultation (IPaC) website indicate that the sites proposed for the study in Presque Isle, PA, lies within the range of the federally endangered Indiana bat (Myotis sodalis) and piping plover (*Charadrius melodus*), proposed threatened monarch butterfly (*Danaus plexippus*), and the threatened rufa red knot (*Calidris canatus rufa*) (USFWS 2025). The alternatives currently under consideration for this phase are not located in critical habitat.

Table 1: Federally Listed Species and Critical Habitat(s) in the proposed study areas of Presque Isle, PA.

Common Name	**Scientific Name**	**Group**	**Status***
Indiana bat	*Myotis sodalis*	Mammal	Endangered
Monarch butterfly	*Danaus plexippus*	Insect	Proposed Threatened
Rufa Red Knot	*Calidris canutus rufa*	Bird	Threatened
Piping Plover	*Charadrius melodus*	Bird	Endangered

Further coordination may be required with the USFWS and PA DCNR to identify species within the project areas to avoid and/or minimize impacts to these species. This may include surveys to identify the presence of such species within the project areas.

- *National Historic Preservation Act (NHPA).* The project's impact on cultural resources will be evaluated in accordance with Engineer Regulation (ER) 1105-2-50 and 36 CFR 800. A review of the National Park Service's National Register of Historic Places and the Pennsylvania State Historic Preservation Office (PA SHPO) historic sites databases were conducted to inform plan formulation. There are currently 6 federally recognized nations which have historical ties or tribal lands within Erie County, PA; these nations include the Delaware Tribe of Indians, Delaware Nation, Wyandotte Nation, Seneca Nation of Indians, Tonawanda Seneca Nation, and the Seneca-Cayuga Nation.

  The USACE will be consulting with the National Park Service, PA SHPO, Tribal Historic Preservation Officers, Tribal Nations, and interested parties during the planning and NEPA process to ensure any proposed alternatives avoid or minimize impacts to cultural resources in collaboration with all applicable resource agencies to ensure compliance with Section 106 of the NHPA. Under Section 106 of this Act, this scoping information initiates USACE consultation with the National Park Service, interested Indian nations, historic preservation organizations and others who are likely to have

knowledge of, or concern with, historic properties that may be present within the area of potential effect (APE). A Section 106 Review - Project Summary Form will be provided to PA SHPO to initiate consultation, including a description of the APE.

7. FEDERAL ENVIRONMENTAL PROTECTION LAWS, ORDERS, AND POLICIES

7.1. PUBLIC LAWS

(a) American Folklife Preservation Act, P.L. 94-201; 20 U.S.C. 2101, *et seq.*
(b) Anadromous Fish Conservation Act, P.L. 89-304; 16 U.S.C. 757, *et seq.*
(c) Antiquities Act of 1906, P.L. 59-209; 16 U.S.C. 431, *et seq.*
(d) Archaeological and Historic Preservation Act, P.L. 93-291; 16 U.S.C. 469, *et seq.* (Also known as the Reservoir Salvage Act of 1960, as amended; P.L. 93-291, as amended; the Moss-Bennett Act; and the Preservation of Historic and Archaeological Data Act of 1974.)
(e) Bald Eagle Act; 16 U.S.C. 668.
(f) Clean Air Act, as amended; P.L. 91-604; 42 U.S.C. 1857h-7, *et seq.*
(g) Clean Water Act, P.L. 92-500; 33 U.S.C. 1251, *et seq.* (Also known as the Federal Water Pollution Control Act; and P.L. 92-500, as amended.)
(h) Coastal Barrier Resources Act of 1982, 16 U.S.C. § 3501 *et seq.*; 12 U.S.C. § 1441 *et seq.*
(i) Coastal Zone Management Act of 1972, as amended, P.L. 92-583; 16 U.S.C. 1451, *et seq.*
(j) Endangered Species Act of 1973, as amended, P.L. 93-205; 16 U.S.C. 1531, *et seq.*
(k) Estuary Protection Act, P.L. 90-454; 16 U.S.C. 1221, *et seq.*
(l) Federal Environmental Pesticide Control Act, P.L. 92-516; 7 U.S.C. 136.
(m) Federal Water Project Recreation Act, as amended, P.L. 89-72; 16 U.S.C. 460-1(12), *et seq.*
(n) Fish and Wildlife Coordination Act of 1958, as amended, P.L. 85-624; 16 U.S.C. 661, *et seq.*
(o) Historic Sites Act of 1935, as amended, P.L. 74-292; 16 U.S.C. 461, *et seq.*
(p) Land and Water Conservation Fund Act, P.L. 88-578; 16 U.S.C. 460/-460/-11, *et seq.*
(q) Migratory Bird Conservation Act of 1928; 16 U.S.C. 715.
(r) Migratory Bird Treaty Act of 1918; 16 U.S.C. 703, *et seq.*
(s) National Environmental Policy Act of 1969, as amended, P.L. 91-190; 42 U.S.C. 4321, *et seq.*
(t) National Historic Preservation Act of 1966, as amended, P.L. 89-655; 16 U.S.C. 470a, *et seq.*
(u) Native American Religious Freedom Act, P.L. 95-341; 42 U.S.C. 1996, *et seq.*
(v) Resource Conservation and Recovery Act of 1976, P.L. 94-580; 7 U.S.C. 1010, *et seq.*
(w) River and Harbor Act of 1899, 33 U.S.C. 403, *et seq.* (Also known as the Refuse Act of 1899.)
(x) Submerged Lands Act of 1953, P.L. 82-3167; 43 U.S.C. 1301, *et seq.*
(y) Surface Mining and Reclamation Act of 1977, P.L. 95-89; 30 U.S.C. 1201, *et seq.*
(z) Toxic Substances Control Act, P.L. 94-469; 15 U.S.C. 2601, *et seq.*
(aa) Watershed Protection and Flood Prevention Act, as amended, P.L. 83-566; 16 U.S.C. 1001, *et seq.*
(bb) Wild and Scenic Rivers Act, as amended, P.L. 90-542; 16 U.S.C. 1271, *et seq.*

7.2. EXECUTIVE ORDERS

(a) Executive Order 11593, Protection and Enhancement of the Cultural Environment. May 13, 1979 (36 FR 8921; May 15, 1971).
(b) Executive Order 11988, Floodplain Management. May 24, 1977 (42 FR 26951; May 25, 1977).
(c) Executive Order 11990, Protection of Wetlands. May 24, 1977 (42 FR 26961; May 25, 1977).
(d) Executive Order 11514, Protection and Enhancement of Environmental Quality, March 5, 1970, as amended by Executive Order, 11991, May 24, 1977.
(e) Executive Order 12088, Federal Compliance with Pollution Control Standards, October 13, 1978.
(f) Executive Order 12372, Intergovernmental Review of Federal Programs, July 14, 1982.
(g) Executive Order 12856, Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements, August 3, 1993.

(h) Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994.

7.3. OTHER FEDERAL POLICIES

(a) Council on Environmental Quality Memorandum of August 11, 1980: Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act.
(b) Council on Environmental Quality Memorandum of August 10, 1980: Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the National Inventory.
(c) Migratory Bird Treaties and other international agreements listed in the Endangered Species Act of 1973, as amended, Section 2(a)(4)

8. POINT OF CONTACT

Interested parties are encouraged to contact the USACE-Buffalo District Environmental Analysis Team with any comments regarding the demonstrations project. Questions or requests for additional information may be directed to:

Buffalo District Environmental Analysis Team

E-mail: EriePAHABStudy@usace.army.mil

Please review the study information and present any comments in writing within thirty (30) days to the attention of the Buffalo District Environmental Analysis Team to the email address listed above or at the following address:

U.S. Army Corps of Engineers, Buffalo District Environmental Analysis Team
478 Main Street
Buffalo, NY 14202-3278
ATTN: ERIE PA HAB STUDY

Thank you for your interest and review of this project.

9. LITERATURE CITED

Devillier, M.V., Hall, R.E., Anderson M.D., and K.A. Lewis (2023). Exposure of blue crab (*Callinectes sapidus*) to modified clay treatment of *Karenia brevis* as a bloom control strategy. *Harmful Algae*, 128, 102492.

Khoshakhlagh, P. (2022). Laponite-Based Nanomaterials for Drug Delivery. *Advanced healthcare materials*, *11*(7), e2102054-n/a.

Li, Y., M. Hondzo, and J. Yang (2024). A synthetic clay removes *Microcystis Aeruginosa* efficiently. *Harmful Algae,* 137, 102667, 1-12.

Laiveling, A., Nauman, C., Stanislawczyk, K., Bair, H.B., Kane, D.D., Chaffin, J.D. 2022. Potamoplankton of the Maumee River during 2018 and 2019: The relationship between cyanobacterial toxins and environmental factors. Journal of Great Lakes Research. Volume 48, Issue 6. 1587-1598. https://doi.org/10.1016/j.jglr.2022.08.015.

United States National Office for Harmful Algal Blooms (U.S. National Office of HAB). 2019. Mycrocystis. https://hab.whoi.edu/species/species-by-name/microcystis/. Accessed November 18, 2025.

U.S. Fish and Wildlife Service (USFWS). 2025. Information for Planning and Consultation (IPaC).