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By: *[Signature]* Date: _____

9/24/2021

**Director's Authorization
Approval
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Ashtabula
DREDGECON04120101**

**OHIO ENVIRONMENTAL PROTECTION AGENCY
HARBOR SEDIMENT AUTHORIZATION FOR LAKE ERIE DREDGE FROM
CONNEAUT HARBOR**

Effective Date: September 24, 2021

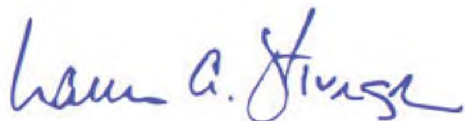
Expiration Date: September 24, 2026

Pursuant to the authority of the Director of the Ohio Environmental Protection Agency (Ohio EPA) under Ohio Administrative Code (OAC) Rule 3745-599-400 and upon consideration of the criteria set forth in OAC Rule 3745-599-410, a harbor sediment authorization is being issued for Lake Erie dredge from Conneaut Harbor and its adjacent or connected maritime commercial port facilities as depicted in Appendix A (hereinafter referred to as "Conneaut Harbor Dredge"). Conneaut Harbor dredge that is covered by and managed in accordance with this harbor sediment authorization is neither a solid waste nor an other waste for the purposes of Chapters 3734 and 6111 of the Ohio Revised Code (ORC), except to the extent that earthen materials are regulated pursuant to those chapters.

Conneaut Harbor is located at the mouth of Conneaut Creek in Ashtabula County, Ohio. A series of authorized federal navigation channels are designed and maintained by the U.S. Army Corps of Engineers (USACE) so that deep-draft commercial vessels can safely navigate the harbor. As sediments deposit through sedimentation and accumulate as shoals, they may impede navigation of the channel, requiring maintenance dredging. Through dredging, the USACE removes sediment, in its natural or recently deposited condition, from the bottom of the federal navigation channel. The dredged sediment typically consists of silts and clays, with some sand. Conneaut Harbor requires maintenance dredging of approximately 75,000 cubic yards per year.

This harbor sediment authorization is limited to the Conneaut Harbor dredge covered by and managed in accordance with the terms and conditions of this authorization. This harbor sediment authorization does not authorize placement of any material into waters of the state, which requires a separate authorization pursuant to ORC Chapter 6111.

Ohio EPA has determined that Conneaut Harbor dredge managed in accordance with the terms and conditions of this harbor sediment authorization is unlikely to create a nuisance or adversely affect public health, safety, or the environment. Ohio EPA makes no determination as to the stability, durability, structural suitability, or appropriateness of the Conneaut Harbor dredge for any particular use. This harbor authorization does not release any person, including but not limited to the owner(s) of the land upon which the Conneaut Harbor dredge is placed, from the duty to comply with all applicable federal, state, and local laws, ordinances, and regulations.



Laurie A. Stevenson
Director

Terms and Conditions

A. Definitions

Unless otherwise stated, all terms used in this harbor sediment authorization shall have the same meaning as used in OAC Chapter 3745-599. The following definitions are specific to this harbor sediment authorization:

“Conneaut Harbor dredge” means Lake Erie dredge that has been excavated or dredged from the Conneaut Harbor dredge geographic area, which includes the breakwater protected Outer Harbor encompassing an area of approximately 142 acres on Lake Erie, an Interior Harbor consisting of a 2,300 foot long river channel through the mouth of Conneaut Creek, and a 1,350 foot long Municipal Access Channel from the Outer Harbor to a shoreline pier, as shown in Appendix A of this harbor sediment authorization.

“Dewatered” means the material has no free liquids as determined by *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846) Test Method 9095B- Paint Filter Liquids Test, as amended through July 2016.

“Lake Erie dredge” means material excavated or dredged from either a federal navigation channel during harbor or navigation maintenance activities or from adjacent or connected commercial maritime port facilities.

“Other wastes” has the same meaning as in ORC section 6111.01(D).

"Person" means an individual, the state, any political subdivision of the state or other state or local body, the United States and any agency or instrumentality thereof, and any legal entity or organization defined as a person under ORC section 1.59, or other entity.

"Sediment processing facility" means a site or location to which Lake Erie dredge is transferred and at which the Lake Erie dredge is dewatered, blended, amended, or otherwise managed prior to distribution or use.

"Solid wastes" has the same meaning as in ORC Section 3734.01.

"Waters of the state" has the same meaning as in ORC Section 6111.01(H).

B. Findings Regarding OAC Rule 3745-599-410 Criteria

The Director has considered the criteria set forth in OAC Rule 3745-599-410 for the Conneaut Harbor dredge and makes the following findings:

1. Land use within the area surrounding Conneaut Harbor consists of a mix of agricultural, residential, recreational, commercial, and industrial uses. Sediment deposited within Conneaut Harbor originates predominantly from runoff of surficial fine-grained soils within the agricultural upper watershed of Conneaut Creek as well as from the littoral drift of Lake Erie sediment throughout the entrance of Conneaut Harbor.
2. The USACE has routinely completed sediment sampling and analysis to evaluate sediment quality within the federal navigation channels of Conneaut Harbor, and has provided these evaluations in the following reports:
 - a. *Sediment Sampling for Chemical and Physical Analysis at Conneaut Harbor, Ohio, 2003;*
 - b. *Chemical and Physical Testing for Sediment Material Collected from Conneaut Harbor Federal Navigation Channels and Reference Areas, Ohio, 2007;*
 - c. *Evaluation of Conneaut Harbor Federal Navigation Channel Sediments with Respect to Their Suitability for Open-Lake Placement, 2013; and*
 - d. *Conneaut Harbor Dredged Sediment Evaluation, 2017.*
3. The historical USACE Conneaut Harbor dredge sediment evaluations determined that concentrations of chemicals detected in the Conneaut Harbor dredge sediment were similar to sediment concentrations from the Conneaut-specific open-water Lake Erie areas where dredge was historically placed and the reference areas.

4. Ohio EPA completed the *Conneaut Harbor Dredge Risk-Based Screening for Upland Use Determination* provided in Appendix B and compared the recent Conneaut Harbor sediment data to the following:
 - a. U.S. EPA's Regional Screening Levels (RSLs) for residential direct contact with soil. The RSLs are protective human health-based criteria for unrestricted residential land use;
 - b. Ohio's Voluntary Action Program (VAP) generic numerical direct-contact soil standards for the residential land use category. Under Ohio's VAP, this is an unrestricted land use category;
 - c. U.S. EPA ecological soil screening levels, which are protective of ecological receptors;
 - d. Background metal soil concentrations from northeast Ohio counties bordering Lake Erie from the Ohio EPA Division of Environmental Response and Revitalization *Evaluation of Background Metal Soil Concentrations in Lorain County July 2019* and *Evaluation of Background Metal Soil Concentrations in Cuyahoga County – Cleveland Area Summary Report March 2013*;
 - e. Sediment reference values available in the Ohio EPA Division of Environmental Response and Revitalization *Ecological Risk Assessment Guidance Document* updated in 2018. Sediment reference values were developed from sediment sampling and analyses conducted at Ohio EPA's Division of Surface Water biological reference sites and represent background sediment concentrations; and
 - f. USACE elutriate data, in order to evaluate potential impacts to surface water and groundwater. As an additional conservative screen for ground water, Conneaut Harbor dredge sediment data was compared to the U.S. EPA soil leaching to ground water RSLs.
5. Ohio EPA's evaluation, documented in the *Conneaut Harbor Dredge Risk-Based Screening for Upland Use Determination* provided in Appendix B, sets forth the following conclusions:
 - a. Conneaut Harbor dredge is not a hazardous waste;
 - b. Conneaut Harbor dredge metals concentrations are below U.S. EPA's residential soil RSLs and Ohio's VAP generic numerical direct-contact soil standards for residential land use or are similar to ambient background soil and sediment concentrations;
 - c. Conneaut Harbor dredge cumulative assessment of carcinogenic PAH concentrations are below U.S. EPA's residential soil RSLs and

- Ohio's VAP generic numerical direct-contact soil standards for residential land use, applying U.S. EPA's toxicity equivalence factors;
- d. Conneaut Harbor dredge concentrations are below U.S. EPA ecological soil screening levels or are similar to ambient background soil and sediment concentrations;
 - e. Conneaut Harbor dredge elutriate concentrations are low or non-detect, and dredge data are below U.S. EPA's soil leaching to ground water RSLs or similar to ambient background soil and sediment levels;
 - f. PCBs as Aroclors were not detected in Conneaut Harbor dredge; and
 - g. Pesticides were not detected in Conneaut Harbor dredge.

C. Coverage & Management Conditions

In order for Conneaut Harbor dredge to be covered by this harbor sediment authorization it must meet all of the provisions in Section C.1. and must be taken to and dewatered at a sediment processing facility that meets the criteria and notice requirements in Section C.2. Conneaut Harbor dredge that is covered by this harbor sediment authorization and is appropriately managed is not considered a solid waste or other waste for purposes of ORC Chapters 3734 and 6111, except to the extent that earthen materials are regulated under those Chapters. Failure to comply with any provision of this harbor sediment authorization, however, would result in the Conneaut Harbor dredge not being covered by this harbor sediment authorization, it would still be considered a solid waste or other waste, and its placement on the ground would require separate authorization from Ohio EPA.

1. Conneaut Harbor Dredge Management Provisions

This harbor sediment authorization covers only Conneaut Harbor dredge to which all of the following apply:

- a. Upon removal from Conneaut Harbor, the Conneaut Harbor dredge is taken directly to a sediment processing facility for which Ohio EPA has received an effective notice that complies with Section C.2 of this harbor sediment authorization.
- b. The Conneaut Harbor dredge is placed into a designated area within the sediment processing facility, which is identified by no fewer than four physical markers, as depicted in the notice submitted in accordance with Section C.2 of this harbor sediment authorization.
- c. The Conneaut Harbor dredge is dewatered at the sediment processing facility and documentation demonstrating the

dewatering, including results from the Paint Filter Liquids Test, is maintained by the sediment processing facility for at least five years and is made available to Ohio EPA upon request.

- d. The Conneaut Harbor dredge is, at a minimum, representatively sampled every 10,000 cubic yards and test results demonstrate that it passes the Paint Filter Liquids Test Method 9095B prior to blending or transport from the sediment processing facility.
- e. The Conneaut Harbor dredge is stored and managed in a manner that does not cause pollution of any waters of the state.
- f. The Conneaut Harbor dredge is neither blended nor comingled with any one or combination of the following materials:
 - i. solid waste as defined in OAC Rule 3745-27-01;
 - ii. other waste or industrial waste as defined in ORC Chapter 6111;
 - iii. hazardous waste as defined in OAC Chapter 3745-51;
 - iv. construction and demolition debris, including pulverized debris and recovered screen material;
 - v. infectious waste as defined in OAC Rule 3745-27-01; and
 - vi. sludge, slag, unfinished compost, or contaminated soil.
- g. Ohio EPA has not been denied access to the Conneaut Harbor dredge and has been permitted to:
 - i. Enter upon the sediment processing facility and other locations where records are retained under OAC Chapter 3745-599 or the terms and conditions of this harbor sediment authorization.
 - ii. Have access to and copy any records that must be kept under OAC Chapter 3745-599 or the terms and conditions of this harbor sediment authorization.
 - iii. Collect samples; take photographs; perform measurements, surveys, and other tests; and inspect at reasonable times equipment (including monitoring and control equipment), practices, or operations regulated or required under OAC Chapter 3745-599 or this harbor sediment authorization.

2. Sediment Processing Facility Special Requirements and Notice

- a. To qualify under this harbor sediment authorization, Conneaut

Harbor dredge must be placed within and dewatered at a sediment processing facility that meets all of the following criteria:

- i. Prior to receiving Conneaut Harbor dredge, the sediment processing facility must have obtained all authorizations required under ORC Chapter 6111; and
- ii. At least thirty (30) days prior to initially receiving the Conneaut Harbor dredge and annually thereafter, the sediment processing facility submits a written notice to Ohio EPA at the address listed in Condition C.2.c that includes all of the following information:
 - (a) A description of the sediment processing facility's location and a map of the sediment processing facility that at a minimum depicts the boundary of the sediment processing facility, and the boundaries of each area designated for the receipt, storage, and dewatering of Conneaut Harbor dredge;
 - (b) The sediment processing facility contact information, including an individual who can provide access, and a manager responsible for the day-to-day operations at the sediment processing facility;
 - (c) A description of the discharge location for any return water from the sediment processing facility; and
 - (d) The estimated Conneaut Harbor dredge capacity of the sediment processing facility.
- b. Ohio EPA's acceptance of this notice does not constitute any acknowledgement that the sediment processing facility otherwise complies with Federal, state, or local statutes or regulations.
- c. For purposes of the sediment processing facility notice in Condition C.2.a.ii, the written notice shall be submitted via the Division of Materials and Waste Management's virtual drop box unless otherwise directed by Ohio EPA in writing:
https://fileshare.epa.ohio.gov/filedrop/co_dmwm_submittals.

D. General Provisions

1. This harbor sediment authorization covers only Conneaut Harbor dredge that is managed, stored, and blended at a sediment processing facility that

meets the criteria set forth in Conditions C.2.a.i. and C.2.a.ii. in such a manner that the activities neither cause a nuisance nor adversely affect public health, safety, or the environment.

2. This harbor sediment authorization does not authorize placement of Conneaut Harbor dredge into waters of the state, which requires separate authorization under ORC Chapter 6111.
3. Nothing in this harbor sediment authorization shall be construed as a waiver from the requirements of ORC Chapter 3734 or the regulations promulgated thereunder, except as expressly provided herein. This harbor sediment authorization shall not be interpreted to release a sediment processing facility from responsibility under ORC Chapters 3704, 3714, 3734, or 6111; under the Federal Clean Water Act, Clean Air Act, the Resource Conservation and Recovery Act, or the Comprehensive Environmental Response, Compensation, and Liability Act; or from other applicable requirements for remedying conditions resulting from any release of contaminants to the environment.

E. Administrative Change

The Director may make an administrative change to this harbor sediment authorization to correct typographical errors.

F. Modification

The Director may modify this harbor sediment authorization in response to changes in applicable laws, rules, or other factors affecting compliance with the terms and conditions of the harbor sediment authorization.

G. Suspension and Revocation.

1. The Director may suspend or revoke this harbor sediment authorization in accordance with OAC Rule 3745-599-400(D). Conneaut Harbor dredge that has been land applied or removed from a sediment processing facility for distribution or use while covered under an effective harbor sediment authorization prior to its suspension or revocation may be regulated pursuant to ORC Chapters 3734 and 6111 only to the extent that earthen materials are regulated pursuant to those chapters.
2. Except as provided in OAC Rule 3745-599-400(E), if the Director suspends or revokes a harbor sediment authorization, any Conneaut Harbor dredge identified in the harbor sediment authorization shall be considered a solid

waste or an other waste as provided in ORC Chapters 3734 and 6111 and the rules adopted thereunder.

Upon consideration of the criteria set forth in OAC Rule 3745-599-410, and in accordance with OAC Rule 3745-599-400, the Director finds that Conneaut Harbor dredge is not a hazardous waste and is unlikely to create a nuisance or adversely affect public health, safety, or the environment. Conneaut Harbor dredge that is covered by and managed in accordance with this harbor sediment authorization is neither a solid waste nor an other waste for purposes of ORC Chapters 3734 and 6111, except to the extent that earthen materials are regulated by those chapters.

You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within 30 days after notice of the director's action. The appeal must be accompanied by a filing fee of \$70.00, made payable to "Treasurer, State of Ohio," which the Commission, in its discretion, may reduce if by affidavit you demonstrate that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the director within three days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

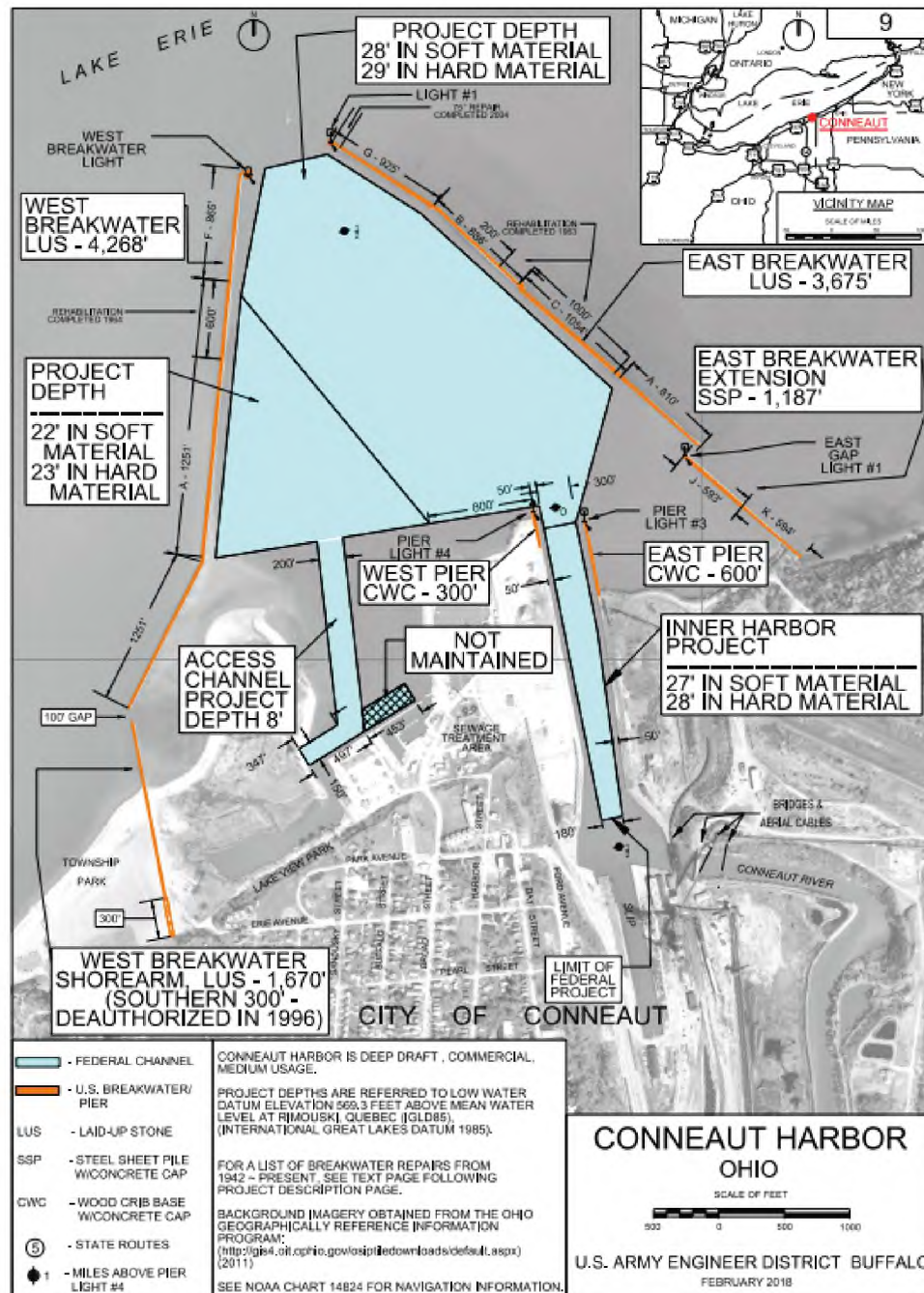
Environmental Review Appeals Commission
30 East Broad Street, 4th Floor
Columbus, Ohio 43215

Appendix A: Conneaut Harbor Dredge Geographic Area

Appendix B: Conneaut Harbor Dredge Risk-Based Screening for Upland Use Determination

APPENDIX A

CONNEAUT HARBOR DREDGE GEOGRAPHIC AREA



The Conneaut Harbor dredge geographic area is the federal channel shown in blue. It includes the breakwater protected Outer Harbor encompassing an area of approximately 142 acres on Lake Erie, an Interior Harbor consisting of a 2,300 foot long river channel through the mouth of Conneaut Creek, and a 1,350 foot long Municipal Access Channel from the Outer Harbor to a shoreline pier.

APPENDIX B
CONNEAUT HARBOR DREDGE
RISK-BASED SCREENING FOR UPLAND USE DETERMINATION

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Figure 1. Conneaut Harbor 2016 Sediment Sampling Locations.

Table 1. Conneaut Harbor Dredge Sediment Initial Risk-Based Screening

Table 2. Conneaut Harbor Dredge Sediment Residential Risk-Based Screening

Table 3. Conneaut Harbor Dredge Sediment Ecological Soil Screening

Conneaut Harbor Dredge Risk-Based Screening for Upland Use Determination

1.0 Introduction

Sediment from Conneaut Harbor in Ashtabula County, Ohio was evaluated for its suitability for upland uses. Ohio EPA compared Conneaut Harbor dredge sediment data to criteria set forth in Ohio Administrative Code ("OAC") Rule 3745-599-410. In accordance with OAC Rule 3745-599-400(A), Ohio EPA's determination in this harbor sediment authorization is limited to the demonstration that upland use of dewatered Conneaut Harbor dredge is unlikely to create a nuisance or adversely affect public health, safety, or the environment. Ohio EPA makes no determination as to the stability, durability, structural suitability, or appropriateness of the Conneaut Harbor dredge for any particular use. Separate evaluations need to be completed for determining the suitability of Conneaut Harbor dredge for aquatic uses. Placement of material into "waters of the state" requires a water quality certification under section 401 of the Clean Water Act from the State of Ohio.

Ohio EPA reviewed historical United States Army Corps of Engineers ("USACE") Conneaut Harbor sediment evaluations and compared recent Conneaut Harbor dredge sediment data to protective risk-based soil screening levels. The data were compared to U.S. EPA Regional Screening Levels ("RSLs") for residential soil, which are protective of both children and adults for unrestricted, residential land uses. The residential soil RSLs are also protective of other land uses, including recreational, commercial, and industrial land uses, because other land uses generally involve less exposure to soil for shorter periods of time. Conneaut Harbor dredge sediment data were also compared to Ohio's Voluntary Action Program ("VAP") generic numerical direct-contact soil standards for the residential land use category. Under Ohio's VAP, this is an unrestricted land use category. For a conservative screen to evaluate protection of ground water, data were also compared to U.S. EPA RSLs for residential soil leaching to ground water. USACE elutriate data were evaluated to address protection to surface water. Conneaut Harbor dredge sediment data were also compared to ambient background levels found in soil and sediment from northeast Ohio counties that border Lake Erie and protective ecological soil screening levels.

2.0 Geographic Area

The Conneaut Harbor dredge geographic area includes the Conneaut Harbor federal navigation channel that is described in Appendix A. It includes the breakwater protected Outer Harbor encompassing an area of approximately 142 acres on Lake Erie, an Interior Harbor consisting of a 2,300 foot long river channel through the mouth of Conneaut Creek, and a 1,350 foot long Municipal Access Channel from the Outer Harbor to a shoreline pier. It does not include areas outside of the federal navigation channel.

Land use within the area surrounding Conneaut Harbor consists of a mix of agricultural, residential, recreational, commercial, and industrial uses. Sediment deposited within

Conneaut Harbor is predominantly from runoff of surficial fine-grained soils within the agricultural upper watershed of Conneaut Creek as well as from the littoral drift of Lake Erie sediment throughout the entrance of Conneaut Harbor.

3.0 Dredge Sediment Data

USACE has routinely completed sediment testing and analysis to evaluate sediment quality to make dredged sediment management decisions within the federal navigation channels of Conneaut Harbor, and has provided these evaluations in the following reports:

- *Sediment Sampling for Chemical and Physical Analysis at Conneaut Harbor, Ohio, 2003;*
- *Chemical and Physical Testing for Sediment Material Collected from Conneaut Harbor Federal Navigation Channels and Reference Areas, Ohio, 2007;*
- *Evaluation of Conneaut Harbor Federal Navigation Channel Sediments with Respect to Their Suitability for Open-Lake Placement, 2013 ("USACE 2013"); and*
- *Conneaut Harbor Dredged Sediment Evaluation, 2017 ("USACE 2017").*

Conneaut Harbor dredge has been characterized through the analysis of bulk sediment samples in accordance with OAC Rule 3745-599-410(A) and (B). USACE collected and analyzed twelve (12) sediment grab samples from similar locations for each of the dredged sediment evaluations completed in 2003, 2007, 2013, and 2017. Bulk sediment samples were analyzed for chemical constituents commonly found in Great Lakes federal navigation channels. USACE conducted laboratory analyses using associated methods on bulk sediment samples for 23 target analyte list metals (EPA 6000/7000), total cyanide (EPA 9010B/9012A), total Kjeldahl nitrogen (EPA 351), ammonia-nitrogen (EPA 350), total phosphorus (EPA 365.4), polycyclic aromatic hydrocarbons ("PAHs") (EPA 8270C), polychlorinated biphenyls ("PCBs") as Aroclors (EPA 8082), pesticides (EPA 8081A), total organic carbon (EPA 9060), total oil and grease (EPA 1664), and grain size (sieve and hydrometer) (ASTM D421, D422).

Chemicals historically identified in Conneaut Harbor federal navigation channel sediment include metals, PAHs, PCBs, and pesticides. USACE reported that concentrations of chemicals detected have been found to be present at low levels, similar to background concentrations found in Conneaut Harbor's Lake Erie open-water placement and reference areas. Based on these sediment evaluations, USACE has routinely concluded that all sediments dredged from the Conneaut Harbor federal navigation channels met federal guidelines for Conneaut Harbor open-water placement and would not cause unacceptable, adverse contaminant-related impacts. USACE's contaminant determinations have been based on Clean Water Act Section 404(b)(1) guidelines (40 CFR 230.11[d]) and guidance prescribed in the following dredged sediment testing and evaluation manuals:

- a. *Great Lakes Dredged Material Testing and Evaluation Manual* (U.S. Environmental Protection Agency (U.S. EPA)/USACE 1992a); and
- b. *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. -Testing Manual* (U.S. EPA/USACE 1998b).

4.0 Evaluation Methods

Ohio EPA reviewed and analyzed the USACE historical Conneaut Harbor dredged sediment evaluations and data in accordance with OAC Rule 3745-599-410(A) and (B), discussed in greater detail below. The most recent data from the USACE 2017 *Conneaut Harbor Dredged Sediment Evaluation* was assessed in the detailed risk-based screening for upland use, taking into consideration the historical data. Maximum concentrations detected in the USACE 2013 were compared to the USACE 2017 maximum detected concentrations to further evaluate historical concentrations. The risk-based screening conducted is summarized in Tables 1-3.

The initial risk-based screening shown in Table 1 compared maximum detection values for each chemical to respective screening levels, including a comparison to representative background soil and sediment levels. This provided a basic overview and conservative initial screen of whether any chemicals may pose potential risk to human health or ecological receptors for upland use.

A more refined risk-based screening was then performed on chemicals with maximum concentrations that exceeded the conservative screening levels. Exposure point concentrations were calculated as the 95% upper confidence limit on the mean ("UCL95"). The 95% upper confidence limit on the mean represents the upper limit of a confidence interval around the sample mean and thus 95% confidence that the true population mean/median is not higher than this value (U.S. EPA 2013; Singh and Singh, 2013). The UCL95 was calculated using maximum likelihood estimation for normal, lognormal, and gamma distributions, as well as non-parametric techniques. Calculations were done using ProUCL 5.0 (USEPA 2013), which provides a recommended UCL95 to use based on goodness-of-fit tests for each distribution.

Risk ratios were then calculated for each analyte by comparing both maximum detection and UCL95 concentrations to relevant cancer or non-cancer risk-based screening levels, which are summarized in Table 2. Cumulative risk ratios—the summed ratios for individual analytes—were then calculated to assess potential cumulative exposures of a single receptor to multiple chemicals. Cumulative risk ratios exceeding unity (1.0) represent unacceptable risk, as determined by U.S. EPA and VAP screening protocols.

4.1. Human Health Residential Risk-Based Screening Levels

The risk-based screening evaluation consisted of comparing the USACE 2013 and 2017 bulk sediment chemistry data to U.S. EPA's RSLs for residential direct contact with soil, updated May 2021, and found at: <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables>.

The RSLs are developed using risk-based guidance from U.S. EPA's Superfund program. They are risk-based concentrations derived from standardized equations combining exposure information assumptions with U.S. EPA toxicity data. U.S. EPA considers the residential RSLs to be protective for humans, including sensitive groups such as children, over a lifetime. Generally, if chemical concentrations fall below the RSLs, then no further action or study regarding human health risk is warranted. RSLs for carcinogenic and non-carcinogenic human health effects were used. The RSLs are based on default exposure parameters and factors that represent reasonable maximum exposure conditions for long-term, chronic exposures for residential land use. The residential soil RSLs are the most protective human health criteria because they account for daily exposures by both children and adults in a residential setting. Residential exposure factors include living at the same residence 350 days per year for 26 years.

Ohio's VAP generic numerical direct-contact soil standards for the residential land use category were also included for comparison purposes, and are found at: <https://epa.ohio.gov/Portals/30/rules/2019-Final-Filed/3745-300-08%20Appendix%201.pdf> (Ohio EPA 2019a). The RSLs are generally more conservative and therefore lower than the VAP residential land use soil standards because they are protective screening levels rather than applicable cleanup standards. The VAP comparisons were included to demonstrate the protectiveness of upland uses of Conneaut Harbor dredge as soil on brownfield properties.

The initial risk-based screening summarized in Table 1 compared maximum chemical concentrations detected and used criteria based on incremental lifetime cancer risks ("ILCR") of one in a million ($1E-06$) and non-cancer health effects with a hazard quotient ("HQ") of 1.0. Further screening was conducted on chemicals that were retained from the initial screening and those results are provided in Table 2. This more refined screening involved using exposure point concentrations calculated as the UCL95 and using the cumulative ILCR of one in 100,000 ($1E-05$).

4.2 Background Soil and Sediment Comparisons

Concentrations of metals in Conneaut Harbor dredge were compared to concentrations established for background soils and sediment reference values, as shown in Tables 1 and 3. Background metal concentrations were obtained from Ohio EPA VAP for Cuyahoga County (Ohio EPA 2013) and Lorain County (Ohio EPA 2019b) because they are from northeast Ohio counties bordering Lake Erie. Ohio EPA has not generated background metals soil concentrations for counties east of Cuyahoga County to date. In addition, Ohio EPA developed specific sediment reference values ("SRVs"), which are available in the Ohio EPA Division of Environmental Response and Revitalization *Ecological Risk Assessment Guidance Document* July 2018 (Ohio EPA 2018) found at: <https://www.epa.ohio.gov/portals/30/rules/RR-031.pdf>. SRVs were developed from sediment sampling and analyses conducted at Ohio's biological reference sites. These reference sites were the same sites used in the development of biological criteria in Ohio and represent background sediment concentrations. Conneaut Harbor metals data were

also compared to sediment data from the Conneaut Harbor's USACE Lake Erie open-lake placement area and reference area (USACE 2017).

4.3 Hazardous Waste Criteria

Concentrations of chemicals detected in Conneaut Harbor dredge were evaluated to determine whether Conneaut Harbor dredge is a hazardous waste as defined by ORC Section 3734.01, OAC Rule 3745-50-10(A), and OAC Rule 3745-51-03.

4.4 Biosolids Waste Concentration Limits Comparison

Conneaut Harbor dredge concentrations of metals were compared to biosolid waste concentration limits set by 40 CFR 503.13 and OAC 3745-40-04(D), and are included in Table 1. There are biosolid waste limits for eight metals (Table 3 of 40 CFR 503.13). If bulk sewage sludge is applied to agricultural land, forest, a public contact site, a reclamation site, or a lawn or home garden, then these concentration limits shall not be exceeded.

4.5 Ecological Soil Screening Levels

An ecological soil screening level evaluation of Conneaut Harbor dredge sediment data was conducted to assess the protectiveness of upland use for areas with sufficient ecological habitat and resources. U.S. EPA Soil Screening Levels ("Eco-SSLs") are concentrations of chemicals in soil that are protective of ecological receptors that commonly come into contact with and/or consume biota that live in or on soil. Eco-SSLs have been derived for four groups of ecological receptors: plants, soil invertebrates, birds, and mammals. Ohio EPA's 2018 ecological risk assessment guidance outlines a soil screening hierarchy using the Eco-SSLs and Oak Ridge National Laboratory preliminary remediation goals for ecological endpoints (Efroymson et al. 1997). Eco-SSLs, last updated in February of 2018, have been developed for sixteen metals, PAHs, PCBs, and some pesticides. Table 3 summarizes the maximum detected and UCL95 concentrations that were screened against available receptors for a particular chemical constituent.

4.6 Surface Water and Ground Water Screening

USACE conducted elutriate testing on Conneaut Harbor dredged sediment samples to predict the release of chemicals to the water column from placement of dredged sediment (USACE 2013, 2017). Elutriate data screening was used as a conservative tool to assess potential impacts to surface water or groundwater from upland use of Conneaut Harbor dredge. Elutriate testing procedures are designed to predict the release of chemicals from dredged material to the water column following placement in an aquatic environment. Standard elutriate tests use a 4:1 ratio by volume of water to solid material (USACE 2014), whereas leachate would be expected to contain a much greater ratio of water to dredge material. As a result, elutriate screening is considered exceptionally conservative for assessing impacts to surface or ground water from dredged sediment. As an additional conservative screen for ground water, Conneaut Harbor dredged

sediment data was compared to the U.S. EPA residential soil leaching to ground water RSLs.

Elutriate data were screened against Ohio's surface water quality criteria for both aquatic life (Lake Erie basin values) and agricultural use (statewide values) and U.S. EPA's promulgated ground water maximum contaminant levels and residential tap water risk-based screening levels available in the RSL tables. Outside mixing zone average values were used for both criteria that are promulgated under Ohio Administrative Code Chapter 3745-1.

5.0 Results

A total of 75 chemical constituents were analyzed by USACE in the laboratory, including 23 metals, 17 PAHs, nine PCBs (measured as Aroclors), 23 pesticides, four anions and nutrients, and three miscellaneous soil parameters (percent moisture, total organic carbon, and oil & grease). For all sediment sample analyses, chemical detections were observed for 20 of the 23 metals and 16 of the 17 PAHs. There were no detections of PCBs or pesticides as shown in Table 1.

5.1 Human Health Residential Risk-Based Screening Levels

The initial risk-based screening compared maximum chemical concentrations detected and used criteria based on the most protective human health risk goals of an ILCR of one in a million ($1E-06$) and an HQ of 0.1. For metals, the initial screening results were also compared to an HQ of 1.0 for comparisons to ambient naturally occurring background concentrations from Lorain and Cuyahoga counties and Ohio EPA's sediment reference values.

More refined screening was conducted on chemicals not screened out as a result of the initial screening and involved using exposure point concentrations calculated as the UCL95 and using the cumulative ILCR of one in 100,000 ($1E-05$). Tables 1 and 2 contain the USACE Conneaut Harbor 2017 sediment sampling results screened against residential soil RSLs, Ohio VAP residential standards, ambient background soil levels, and sediment reference values.

As shown in Table 1 and highlighted in yellow, arsenic was the only metal present at concentrations above the most protective residential RSL at the $1E-06$ ILCR. However, the maximum arsenic concentration of 15 mg/kg and the UCL95 for arsenic of 13 mg/kg are both below the soil background and sediment reference levels. Aluminum, antimony, cobalt, and nickel exceeded the screening level at an HQ of 0.1 but were present at concentrations representative of background conditions. None of the metals results exceeded the non-cancer hazard quotient of 1.0.

PAHs were the only semi-volatile organic compounds detected in Conneaut Harbor dredge (USACE 2017). Benzo(a)pyrene was the only PAH that exceeded the residential RSL at the ILCR of $1E-06$, as shown in Table 1 and highlighted in yellow. The UCL95 for benzo(a)pyrene is 0.13, slightly above 0.11, the RSL at $1E-06$ ILCR. None of the PAHs

exceeded the RSL at an HQ of 0.1. The USACE 2013 PAH data was also analyzed. The 2013 UCL95 for benzo(a)pyrene is 0.16, also above 0.11, the RSL at 1E-06 ILCR, with none of the other carcinogenic PAHs exceeding the RSL at an HQ of 0.1.

Due to this small benzo(a)pyrene RSL exceedance at 1E-06 ILCR, the seven carcinogenic PAHs (“cPAHs”), benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz[a,h]anthracene, and indeno[1,2,3,-c,d]pyrene were evaluated cumulatively at a 1E-05 ILCR using the U.S. EPA benzo[a]pyrene (B[a]p) equivalence method and toxicity equivalence factors (“TEF”) (USEPA, 2020). The cumulative TEF using maximum concentrations was 0.37, and using UCL95s was 0.17, which are both well below the target of 1.1 mg/kg of B[a]P equivalence. Table 2 shows that the seven total cPAH concentrations are well below RSLs for residential land use, using a cumulative cancer risk goal of 1E-05 ILCR. For each individual carcinogenic PAH, the UCL95 is lower than or nearly the same as the RSL at the 1E-06 ILCR.

5.2 Background Soil and Sediment Comparisons

As shown in Table 1, Conneaut Harbor metal concentrations were determined to be representative of background metals concentrations. Metals data for the Conneaut Harbor’s Lake Erie open-lake placement area and reference area were also reviewed (USACE 2013; USACE 2017). Concentrations of metals in Conneaut Harbor dredge were compared to concentrations established for background soils from Ohio EPA VAP for Cuyahoga County (Ohio EPA 2013) and Lorain County (Ohio EPA 2019b) and Ohio sediment reference values (Ohio EPA 2018).

5.3 Hazardous Waste Criteria

Concentrations of chemicals detected in Conneaut Harbor dredge were evaluated to determine that Conneaut Harbor dredge is not a hazardous waste as defined by ORC Section 3734.01, OAC Rule 3745-50-10(A), and OAC Rule 3745-51-03. U.S. EPA publication SW-846, “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods” Section 1.2 of the Toxicity Characteristic Leaching Procedure (“TCLP”) Method 1311 allows for a total constituent analysis in lieu of the TCLP extraction if the individual constituents are not present or are present at such low concentrations that the levels could not possibly be exceeded.

As shown in Tables 1 and 2, Conneaut Harbor dredged sediment concentrations are below the residential RSLs and representative ambient background levels in soil and sediment. Arsenic was the only metal present at concentrations above the most protective residential RSL at the 1E-06 ILCR. However, the maximum arsenic concentration of 15 mg/kg and UCL95 of 13 mg/kg are below background soil and sediment reference levels. Table 2 demonstrates that total cPAH concentrations are below RSLs for residential land use, using a cumulative cancer risk goal of 1E-05 ILCR. For each individual carcinogenic PAH, the UCL95 is lower than or nearly the same as the

RSL at the 1E-06 ILCR. PCBs and pesticides were not detected in Conneaut Harbor dredge.

5.4 Biosolids Metals Concentration Limits Comparison

Conneaut Harbor dredge concentrations of metals were compared to the biosolids waste limits that are available for eight metals. As shown in Table 1, all the maximum detected concentrations of metals in Conneaut Harbor dredge were below the biosolids waste limits for metals.

5.5 Ecological Soil Screening Levels

Table 3 summarizes the ecological soil screening evaluation of the Conneaut Harbor dredge sediment data. The data were compared to the Eco-SSLs, Ohio background metal soil concentrations, and Ohio sediment reference values. Eco-SSLs are derived to be protective of the conservative end of the exposure and effects species distribution and are intended to be applied at the screening stage. Because of the conservative nature of the Eco-SSLs, U.S. EPA emphasizes that it is inappropriate to adopt them as cleanup standards. Because some of the Eco-SSLs are low, comparison to ambient background levels is an important component and was conducted in the ecological soil risk-based screening. From this evaluation, no ecological chemicals of concern were identified for further assessment.

5.6 Surface Water and Ground Water Screening Levels

USACE conducted elutriate test analyses on Conneaut Harbor dredged sediment (USACE 2013, USACE 2017). PAHs, pesticides, and PCBs were generally not detected in the elutriate samples. There were several low detections of delta-hexachlorocyclohexane and gamma-chlordane. Metals, ammonia, phosphorous, oil, and grease were detected at low levels, below Ohio's surface water quality criteria for both aquatic life (Lake Erie basin values) and agricultural use (statewide values) (USACE 2013, USACE 2017). Elutriate results were also screened against the conservative soil leaching to ground water RSLs. Several metals were identified as exceeding leaching to ground water RSLs. Since the concentrations of metals in the dredged sediment are representative of ambient background soil and sediment metals levels, it is unlikely that there would be impacts to surface water or groundwater from upland use of Conneaut Harbor dredge.

6.0 Conclusions

Upon consideration of the criteria set forth in OAC Rule 3745-599-410, Ohio EPA has determined that dewatered Conneaut Harbor dredge is not a hazardous waste and its upland use is unlikely to create a nuisance or adversely affect public health, safety, or the environment. Through this risk-based evaluation, it has been determined that Conneaut Harbor dredge can be safely used as soil for unrestricted land uses that include

residential, recreational, commercial, and industrial land uses. The conclusions from this risk-based screening for upland use determination are as follows:

- a. Conneaut Harbor dredge metals concentrations are below U.S. EPA's RSLs for residential land use or are similar to ambient background soil and sediment concentrations;
- b. Conneaut Harbor dredge total PAH concentrations are below U.S. EPA's RSLs for residential land use, using a cumulative cancer risk goal;
- c. Polychlorinated biphenyls (PCBs) as Aroclors were not detected in Conneaut Harbor dredge;
- d. Pesticides were not detected in Conneaut Harbor dredge;
- e. Conneaut Harbor dredge concentrations are below ecological screening levels or are similar to ambient background soil and sediment concentrations; and
- f. Conneaut Harbor dredge elutriate data are low or non-detect. Dredge data are below U.S. EPA's soil leaching to ground water RSLs or similar to ambient background soil and sediment levels, demonstrating that it is unlikely that there would be impacts to surface water or groundwater from upland use of Conneaut Harbor dredge.

7.0 References

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Figure 1. Conneaut Harbor 2016 Sediment Sampling Locations, USACE (2017).

Table 1. Conneaut Harbor Sediment Risk-Based Screening and Background Levels

All units are mg/kg (ppm)				Range of Detections					Screening Levels						Biosolids Limits 40 CFR503.13 Table 3	Background Levels			Initial Screening Results				
Parameter	CAS Number	Number of Samples	Number of Detections	Minimum Detection	Maximum Detection	95UCL	Maximum Detection Location ID	Maximum Detection 2013 Compare	USEPA RSL Residential ICLR 1E-06	USEPA RSL Residential HQ 0.1	USEPA RSL Residential HQ 1.0	Ohio VAP Residential ICLR 1E-05	Ohio VAP Residential HQ 1.0	USEPA RSL Soil to GW 1E- 05/HQ1.0		Cuyahoga County Soil Background	Lorain County Soil Background	SRV Erie/Ontario Lake Plain	Max exceeds USEPA Residential RSL?	Max exceeds VAP Residential GNS?	Max exceeds Biosolids limit	Max exceeds soil background	Max exceeds sediment reference value?
METALS																							
ALUMINUM	7429-90-5	12	12	11000	27000	20000	16-CH-01	15000		7700	77000			30000			11521	29000	no			yes	no
ANTIMONY	7440-36-0	12	12	7	13	11	16-CH-01	0.23		3.1	31		63				1.3		no				no
ARSENIC	7440-38-2	12	12	10	15	13	16-CH-04,05	15	0.68	3.5	35	14	70	0.29	41	24	19.1	25	YES	YES	no	no	no
BARIUM	7440-39-3	12	12	47	110	81	16-CH-01	77		1500	15000		30000	82		98.9	82.6	190	no	no		no	no
BERYLLIUM	7440-41-7	12	12	0.43	0.99	0.8	16-CH-12	0.8	1600	16	160	22000	310	3.2			0.61	0.8	no	no		yes	yes
CADMIUM	7440-43-9	12	12	0.25	0.75	0.42	16-CH-12	0.81	2100	7.1	71	30000	140		39	0.384		0.79	no	no	no	no	no
CALCIUM	7440-70-2	12	12	4500	22000	15000	16-CH-11	22000									2522	21000				yes	yes
CHROMIUM, TOTAL	7440-47-3	12	12	13	27	23	16-CH-01	23								21.1	18.2	29	no			no	no
COBALT	7440-48-4	12	12	8	15	12	16-CH-01	16	420	2.3	23	5900	47	0.27			15.7	12	no				yes
COPPER	7440-50-8	12	12	69	100	91	16-CH-12	38		310	3100		6300	46	1500		26	32	no	no	no		yes
IRON	7439-89-6	12	12	24000	42000	34000	16-CH-01	38000		5500	55000				350		36177	41000	no			yes	no
LEAD	7439-92-1	12	12	13	22	19	16-CH-01,12	26		400	400		400			51.7	29.5	47	no	no	no	no	no
MAGNESIUM	7439-95-4	12	12	7100	10000	8600	16-CH-12	7500									3076	7100				yes	yes
MANGANESE	7439-96-5	12	12	450	780	610	16-CH-01	660		180	1800		3600				1504	1500	no				no
MERCURY	7439-97-6	12	12	0.017	0.039	0.037	16-CH-12	0.037		1.1	11		9.9	0.1	17	0.097	0.0513	0.12	no	no		no	yes
NICKEL	7440-02-0	12	12	25	40	37	16-CH-01,12	37	15000	15	150	210000	3100	26	420		30.4	33	no	no	no		yes
POTASSIUM	7440-09-7	12	12	2100	4400	3500	16-CH-01	2300									679	6800			no		no
SELENIUM	7782-49-2	12	0	-	-	-	-	-		39	390		780	0.26	100	0.943	1.79	1.7	no	no	no	no	no
SILVER	7440-22-4	12	0	-	-	-	-	-		39	390		780					0.43	no	no			no
SODIUM	7440-23-5	12	12	120	200	150	16-CH-12	120									37.3						
THALLIUM	7440-28-0	12	0	-	-	-	-	-		0.078	0.78						0.966	4.7	no				no
VANADIUM	7440-62-2	12	12	16	31	26	16-CH-01	23		39	390		620	86			25.5	40	no				yes
ZINC	7440-66-6	12	12	69	120	96	16-CH-12	120		2300	23000		47000	370	2800		73.6	160	no	no	no	yes	no
POLYCYCLIC AROMATIC HYDROCARBONS																							
2-METHYLNAPHTHALENE	91-57-6	12	11	0.020	0.076	-	16-CH-12	0.035		24	240			0.19									
ACENAPHTHENE	83-32-9	12	3	0.016	0.078	-	16-CH-12	0.035		360	3600		7200	5.5					no	no			
ACENAPHTHYLENE	208-96-8	12	4	0.011	0.087	-	16-CH-12	0.027															
ANTHRACENE	120-12-7	12	11	0.018	0.140	-	16-CH-12	0.087		1800	18000		36000	58					no	no			
BENZO(A)ANTHRACENE	56-55-3	12	8	0.056	0.280	0.120	16-CH-12	0.26	1.1			23		0.11					no	no			
BENZO(A)PYRENE	50-32-8	12	12	0.054	0.290	0.130	16-CH-12	0.29	0.11	1.8	18	2.3	36	0.24					YES	no			
BENZO(B)FLUORANTHENE	205-99-2	12	12	0.086	0.370	0.150	16-CH-12	0.37	1.1			23		3					no	no			
BENZO(G,H,I)PERYLENE	191-24-2	12	10	0.023	0.190	-	16-CH-12	0.24															
BENZO(K)FLUORANTHENE	207-08-9	12	8	0.040	0.170	0.090	16-CH-12	0.15	11			230		29					no	no			
CHRYSENE	218-01-9	12	12	0.064	0.320	0.160	16-CH-12	0.36	110			2300		90					no	no			
DIBENZ(A,H)ANTHRACENE	53-70-3	12	0	-	-	-	-	0.05	0.11			2.3		0.96					no	no			
FLUORANTHENE	206-44-0	12	12	0.130	0.390	-	16-CH-06	0.55		240	2400		4800	89					no	no			
FLUORENE	86-73-7	12	4	0.016	0.110	-	16-CH-12	0.056		240	2400		4800	5.4					no	no			
INDENO(1,2,3-C,D)PYRENE	193-39-5	12	12	0.023	0.170	0.080	16-CH-12	0.19	1.1			23		9.8					no	no			
NAPHTHALENE	91-20-3	12	11	0.015	0.052	-	16-CH-12	0.029	2	13	130	96	320						no	no			
PHENANTHRENE	85-01-8	12	12	0.063	0.540	-	16-CH-12	0.31															
PYRENE	129-00-0	12	11	0.096	0.330	-	16-CH-06	0.62		180	1800		3600	13					no	no			
POLYCHLORINATED BIPHENYLS																							
PCB, TOTAL (AROCLOR)	1336-36-3	12	0	-	-		-		0.23			5							no	no			
PCB-1016 (AROCLOR 1016)	12674-11-2	12	0	-	-		-		6.6	0.41	4.1	130	8.2						no	no			
PCB-1221 (AROCLOR 1221)	11104-28-2	12	0	-	-		-		0.2			3.9							no	no			
PCB-1232 (AROCLOR 1232)	11141-16-5	12	0	-	-		-		0.17			3.4							no	no			
PCB-1242 (AROCLOR 1242)	53469-21-9	12	0	-	-		-		0.23			4.6							no	no			
PCB-1248 (AROCLOR 1248)	12672-29-6	12	0	-	-		-		0.23			4.5							no	no			
PCB-1254 (AROCLOR 1254)	11097-69-1	12	0	-	-		-		0.24			4.7							no	no			
PCB-1260 (AROCLOR 1260)	11096-82-5	12	0	-	-		-		0.24			4.8							no	no			
PCB-1262 (AROCLOR 1262)	37324-23-5	12	0	-	-		-																
PCB-1268 (AROCLOR 1268)	11100-14-4	12	0	-	-		-																
PESTICIDES																							
ALDRIN	309-00-2	12	0	-	-		-		0.039	0.23	2.3	0.62	3.8										

Table 2. Conneaut Harbor Dredge Sediment Residential Soil Risk-Based Screening																			
All units are mg/kg (ppm)		Exposure Concentration				USEPA Residential Soil RSL					Ohio VAP Residential Soil GNS					Carcinogenic PAHs Maximum		Carcinogenic PAHs 95UCL	
Parameter	CAS Number	Maximum Detection 2017	95UCL 2017	Maximum Detection 2013	95UCL 2013	Cancer risk screening 1E-05	Cancer risk ratio for maximum	Cancer risk ratio for 95UCL	Non-Cancer screening HQ =1	Hazard Index ratio for maximum	Cancer risk standard 1E- 05	Cancer risk ratio for maximum	Cancer risk ratio for 95UCL	Non-Cancer standard HQ =1	Hazard Index ratio maximum	TEF	BaP Equiv	TEF	BaP Equiv
POLYNUCLEAR AROMATIC HYDROCARBONS																			
BENZO(A)ANTHRACENE	56-55-3	0.28	0.12	0.26	0.14	11	0.025	0.011			23	0.012	0.005			0.100	0.028	0.100	0.012
BENZO(A)PYRENE	50-32-8	0.29	0.13	0.29	0.16	1.1	0.263	0.118	18	0.016	2.3	0.126	0.057	36	0.01	1.000	0.290	1.000	0.130
BENZO(B)FLUORANTHENE	205-99-2	0.37	0.15	0.37	0.22	11	0.034	0.014			23	0.016	0.007			0.100	0.037	0.100	0.015
BENZO(K)FLUORANTHENE	207-08-9	0.17	0.09	0.15	0.08	110	0.002	0.001			230	0.001	0.000			0.010	0.002	0.010	0.002
CHRYSENE	218-01-9	0.32	0.16	0.36	0.18	1100	0.000	0.000			2300	0.000	0.000			0.001	0.000	0.001	0.000
DIBENZ(A,H)ANTHRACENE	53-70-3	-	-	-	-	1.1	0.000	0.000			2.3	0.000	0.000			1.000	0.000	1.000	0.000
INDENO(1,2,3-C,D)PYRENE	193-39-5	0.17	0.08	0.19	0.09	11	0.015	0.007			23	0.007	0.003			0.100	0.017	0.100	0.008
																SUM PAHs	0.37	SUM PAHs	0.17

Table 3. Conneaut Harbor Dredge Sediment Ecological Soil Screening																			
All units are mg/kg (ppm)				Range of Detections			Maximum Detected Sample	U.S. EPA Ecological Soil Screening Levels						Ohio Background Values			Ecological Soil Screening Results		
Parameter	CAS Number	Number of Samples	Number of Detections	Minimum Detection	Maximum Detection	95UCL	Location ID	U.S. EPA Eco-SSLs	Plant	Soil Inverts	Wildlife Avain	Wildlife Mammals	Oak Ridge Ecological Endpoints	Cuyahoga County	Lorain County	SRV Erie/Ontario Lake Plain	Maximum exceeds screening level?	Maximum exceeds soil background?	Maximum exceeds SRV?
METALS																			
ALUMINUM	7429-90-5	12	12	11000	27000	20000	16-CH-01								11521	29000			no
ANTIMONY	7440-36-0	12	12	7.00	13.00	11.00	16-CH-01	0.27		78		0.27	5			1.3	yes		yes
ARSENIC	7440-38-2	12	12	10.00	15.00	13.00	16-CH-04,05	18	18		43	46	9.9	24	19.1	25	no	no	no
BARIUM	7440-39-3	12	12	47.00	110.00	81.00	16-CH-01	330		330		2000	283	98.9	82.6	190	no	no	no
BERYLLIUM	7440-41-7	12	12	0.43	0.99	0.80	16-CH-12	21		40		21	10		0.61	0.8	no		no
CADMIUM	7440-43-9	12	12	0.25	0.75	0.42	16-CH-12	0.36	32	140	0.77	0.36	4	0.384		0.79	no	no	no
CALCIUM	7440-70-2	12	12	4500	22000	15000	16-CH-11								2522	21000			yes
CHROMIUM, TOTAL	7440-47-3	12	12	13.00	27.00	23.00	16-CH-01							21.1	18.2	29		yes	no
COBALT	7440-48-4	12	12	8.00	15.00	12.00	16-CH-01	13	13		120	230	20		15.7	12	no		no
COPPER	7440-50-8	12	12	69	100	91	16-CH-12	28	70	80	28	49	60		26	32	yes		yes
IRON	7439-89-6	12	12	24000	42000	34000	16-CH-01								36177	41000			no
LEAD	7439-92-1	12	12	13.00	22.00	19.00	16-CH-01,12	11	120	1700	11	56	40.5	51.7	29.5	47	no	no	no
MAGNESIUM	7439-95-4	12	12	7100	10000	8600	16-CH-12								3076	7100		yes	yes
MANGANESE	7439-96-5	12	12	450	780	610	16-CH-01	220	220	450	4300	4000			1504	1500	no	no	no
MERCURY	7439-97-6	12	12	0.017	0.039	0.037	16-CH-12						0.00051	0.097	0.0513	0.12	no	no	no
NICKEL	7440-02-0	12	12	25.00	40.00	37.00	16-CH-01,12	38	38	280	210	130	30		30.4	33	yes	no	yes
POTASSIUM	7440-09-7	12	12	2100	4400	3500	16-CH-01								679	6800		yes	no
SELENIUM	7782-49-2	12	0	-	-	-	-	0.52	0.52	4.1	1.2	0.63	0.21	0.943	1.79	1.7	no	no	no
SILVER	7440-22-4	12	0	-	-	-	-	4.2	560		4.2	14	2			0.43	no		no
SODIUM	7440-23-5	12	12	120	200	150	16-CH-12								37.3			yes	
THALLIUM	7440-28-0	12	0	-	-	-	-						1		0.966	4.7	no	no	no
VANADIUM	7440-62-2	12	12	16.00	31.00	26.00	16-CH-01	7.8			7.8	280	2		25.5	40	yes	no	no
ZINC	7440-66-6	12	12	69	120	96	16-CH-12	46	160	120	46	79	8.5		73.6	160	yes	yes	no
POLYCYCLIC AROMATIC HYDROCARBONS																			
ACENAPHTHENE	83-32-9	12	3	0.016	0.078	-	16-CH-12	29					20				no		
ACENAPHTHYLENE	208-96-8	12	4	0.011	0.087	-	16-CH-12	29									no		
ANTHRACENE	120-12-7	12	11	0.018	0.14	-	16-CH-12	29									no		
BENZO(A)ANTHRACENE	56-55-3	12	8	0.056	0.28	0.115	16-CH-12	1.1									no		
BENZO(A)PYRENE	50-32-8	12	12	0.054	0.29	0.133	16-CH-12	1.1									no		
BENZO(B)FLUORANTHENE	205-99-2	12	12	0.086	0.37	0.148	16-CH-12	1.1									no		
BENZO(G,H,I)PERYLENE	191-24-2	12	10	0.023	0.19	-	16-CH-12	1.1									no		
BENZO(K)FLUORANTHENE	207-08-9	12	8	0.04	0.17	0.08693	16-CH-12	1.1									no		
CHRYSENE	218-01-9	12	12	0.064	0.32	0.1637	16-CH-12	1.1									no		
DIBENZ(A,H)ANTHRACENE	53-70-3	12	0	-	-	-	-	1.1									no		
FLUORANTHENE	206-44-0	12	12	0.13	0.39	-	16-CH-06	1.1									no		
FLUORENE	86-73-7	12	4	0.016	0.11	-	16-CH-12	29									no		
INDENO(1,2,3-C,D)PYRENE	193-39-5	12	12	0.023	0.17	0.07734	16-CH-12	1.1									no		
NAPHTHALENE	91-20-3	12	11	0.015	0.052	-	16-CH-12	29									no		
PHENANTHRENE	85-01-8	12	12	0.063	0.54	-	16-CH-12	29									no		
PYRENE	129-00-0	12	11	0.096	0.33	-	16-CH-06	1.1									no		
POLYCHLORINATED BIPHENYLS																			
PCB, TOTAL (AROCLO)	1336-36-3	12	0	-	-	-	-						0.371				no detects		
PCB-1016 (AROCLO 1016)	12674-11-2	12	0	-	-	-	-										no detects		
PCB-1221 (AROCLO 1221)	11104-28-2	12	0	-	-	-	-										no detects		
PCB-1232 (AROCLO 1232)	11141-16-5	12	0	-	-	-	-										no detects		
PCB-1242 (AROCLO 1242)	53469-21-9	12	0	-	-	-	-										no detects		
PCB-1248 (AROCLO 1248)	12672-29-6	12	0	-	-	-	-										no detects		
PCB-1254 (AROCLO 1254)	11097-69-1	12	0	-	-	-	-										no detects		
PCB-1260 (AROCLO 1260)	11096-82-5	12	0	-	-	-	-										no detects		
PCB-1262 (AROCLO 1262)	37324-23-5	12	0	-	-	-	-										no detects		
PCB-1268 (AROCLO 1268)	11100-14-4	12	0	-	-	-	-										no detects		
PESTICIDES																			
ALDRIN	309-00-2	12	0	-	-	-	-										no detects		
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	319-84-6	12	0	-	-	-	-										no detects		
ALPHA ENDOSULFAN	959-98-8	12	0	-	-	-	-										no detects		
ALPHA-CHLORDANE	5103-71-9	12	0	-	-	-	-										no detects		
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	319-85-7	12	0	-	-	-	-										no detects		
BETA ENDOSULFAN	33213-65-9	12	0	-	-	-	-										no detects		
CHLORDANE	57-74-9	12	0	-	-	-	-										no detects		
DDD (1,1-BIS(CHLOROPHENYL)-2,2-DICHLOROETHANE)	72-54-8	12	0	-	-	-	-	0.021			0.093	0.021					no detects		
DDE (1,1-BIS(CHLOROPHENYL)-2,2-DICHLOROETHENE)	72-55-9	12	0	-	-	-	-	0.021			0.093	0.021					no detects		
DDT (1,1-BIS(CHLOROPHENYL)-2,2,2-TRICHLOROETHANE)	50-29-3	12	0	-	-	-	-	0.021			0.093	0.021					no detects		
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	319-86-8	12	0	-	-	-	-										no detects		
DIELDRIN	60-57-1	12	0	-	-	-	-	0.0049			0.022	0.0049					no detects		
ENDOSULFAN SULFATE	1031-07-8	12	0	-	-	-	-										no detects		
ENDRIN	72-20-8	12	0	-	-	-	-										no detects		
ENDRIN ALDEHYDE	7421-93-4	12	0	-	-	-	-										no detects		
ENDRIN KETONE	53494-70-5	12	0	-	-	-	-										no detects		
GAMMA BHC (LINDANE)	58-89-9	12	0	-	-	-	-										no detects		
GAMMA-CHLORDANE	5566-34-7	12	0	-	-	-	-										no detects		
HEPTACHLOR	76-44-8	12	0	-	-	-	-										no detects		
HEPTACHLOR EPOXIDE	1024-57-3	12	0	-	-	-	-										no detects		
METHOXYCHLOR	72-43-5	12	0	-	-	-	-										no detects		
TOXAPHENE	8001-35-2	12	0	-	-	-	-										no detects		