

## Cleveland Harbor's Advancements in Sustainable Dredge Material Management

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**Background/Objectives.** In Ohio, nearly 1.5 million cubic yards (cy) of dredge sediment is removed across eight federally maintained harbors annually. The harbors are critical in linking Ohio to the global economy. Beginning in 2020, the open lake placement of dredged sediment in Lake Erie is prohibited by State law. This law will protect the Lake from the resuspension of industrial pollutants, combined sewer overflow contamination, nutrient loading from urban and agricultural runoff.

Annually, Cleveland Harbor requires 250,000 cy of dredge sediment to maintain navigation. These dredging efforts support the transport of 13 million tons of cargo, 20,000+ jobs and create \$3.5B in economic value in the region. Historically, the dredge sediment from Cleveland Harbor has not qualified for open lake placement nor will it in the future as result of the 2020 State law. Since the late 1960s this material has been deposited into a series of confined disposal facilities (CDFs) in Cleveland Harbor. A 2011 report issued by the USACE indicated that the Port of Cleveland, out of the 58 federally maintained ports in the Great Lakes, was one of two Great Lakes ports critically at risk of channel restriction as a result of limited remaining CDF capacity. Federal estimates for the construction of a new CDF were estimated at \$54.65/cy in 2011 dollars, including the cost of dredging and transport.

**Approach/Activities.** The Port Authority recognized the continued lateral expansion of Cleveland's CDFs was not the most economically viable solution for local or Federal parties, nor was it the most environmentally responsible solution or the highest and best use of Cleveland's waterfront. As a result, the Port Authority sought a solution to extend the life of the existing CDFs through the implementation of a beneficial reuse process that would reduce the annual consumption rate of the limited remaining CDF capacity. After an extensive period of study and research, the Port Authority constructed a demonstration facility (Phase 1) in 2015 to test whether beneficially harvesting and processing dredge sediment by hydraulically sorting the sediment was economically viable, scalable, and whether market existed locally for this material.

**Results/Lessons Learned.** Since 2015, the Port Authority has received 665,000 cy of dredge sediment, of which we have beneficially harvested and repurposed approximately 415,000 cy material off site. This equates to a 60% annual consumption rate reduction of the remaining CDF capacity. Through modeling, it is projected there is sufficient capacity to operate the existing facilities under this model for the next 20+ years at an all-in cost of \$30-35 per cy including dredging and transport.

The Port of Cleveland's full-scale operation of its Sediment Processing & Management Facility serves as a successful model for other Port Authority's in solving their dredge material and management issues. The Port of Cleveland continues to seek alternatives to reduce dredging costs and one day eliminate the need to permanently store dredge sediment in CDFs. The Port of Cleveland sees a day, in the not so distant future, where 100% of Cleveland's dredge sediment could be beneficially harvested/repurposed, eliminating the reliance on CDFs. In 2019 the Port Authority will undertake a new study to explore new and innovative solutions that build

and harnesses its success to date, to advance Cleveland Harbor to a sustainable long-term solution for management of dredge sediment.