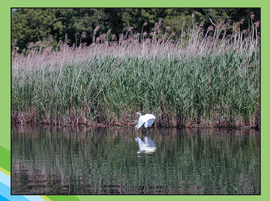
EAST CHICAGO SEDIMENT REMEDIATION DEMONSTRATION PROJECT

US Army Corps of Engineers ®
Chicago District



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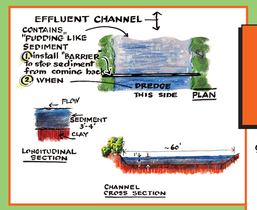
E.C.S.D.
WASTEWATER DIVISION

Overview

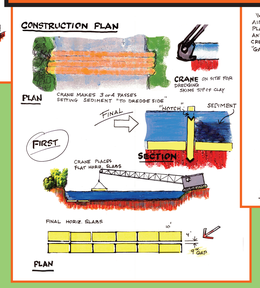
The U.S. Army Corps of Engineers (USACE), Chicago District, in partnership with the East Chicago Sanitary District (ECSD) plan to conduct a project that will demonstrate technologies for remediation of contaminated sediment. These technologies may be useful for remediation of the non-Federal portions of the Indiana Harbor Canal (IHC) and the Grand Calumet River (GCR) located in northwest Indiana. The IHC/GCR is listed as one of 43 Areas of Concern (AOC) in the Great Lakes and holds impairments on all 14 beneficial use categories, an indication of the significant environmental contamination. Contaminated sediment is responsible for most environmental problems. This demonstration project will provide valuable information that may be applied to a much larger study of managing contaminated sediment in the IHC/GCR, and possibly to other projects in the Great Lakes AOC.

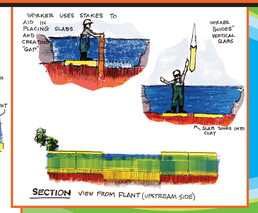
The demonstration project site encompasses a 600- by 40-foot channel that carries discharge from the ECSD water reclamation facility into the GCR. This site is representative of the conditions within the GCR, including similar sediment characteristics and overbank conditions. Demonstration project features include installing a sediment barrier to prevent migration of the contaminated sediment into the channel during and after dredging. The barrier will be located just upstream of the confluence of the channel and the GCR, and will separate the remediated channel from contaminated sediment in the GCR. Design consists of a series of vertical precast concrete panels installed across the width of the channel. The vertical panels are supported on both sides by horizontal panels placed along the channel bottom. Remediation of the GCR may use a similar approach with barriers preventing recontamination by separating contaminated reaches from those that have been remediated. After installing the barrier, sediment in the channel will most likely be removed by mechanical dredging. Dredging is a critical feature to the success of the demonstration project because restoration activities cannot occur prior to managing the contaminated sediment.

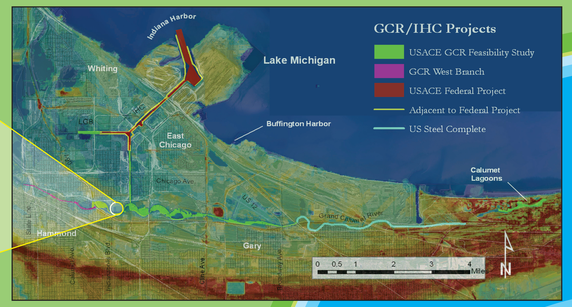
Other project features include restoration, stabilization, and post-construction monitoring. Restoration includes creating a more natural streambed that will demonstrate the feasibility of in-stream capping to isolate remnant contamination from biological communities and to create aquatic habitat. The streambed will be constructed of sand and stone similar to those originally found in the region. It will also feature a series of pools, riffles, and meanders. The meandered channel will function similar to a natural riverine system, but at a much smaller scale. Stabilization includes regrading the banks to a more natural slope less susceptible to erosion, and replanting the banks with native species to help prevent recontamination and to improve terrestrial habitat. A three-year post-construction monitoring program will evaluate the success of project features to restore water quality, improve aquatic and terrestrial habitats, and resist recontamination.



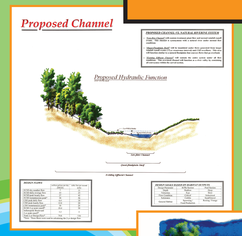
Phase 1
Install Sediment Barrier and Dredge

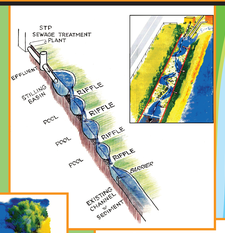


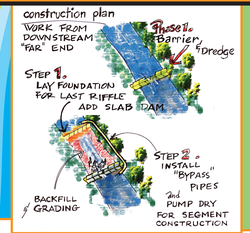


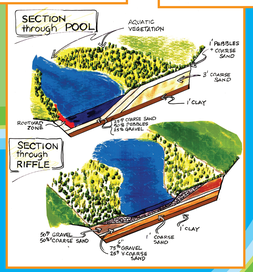


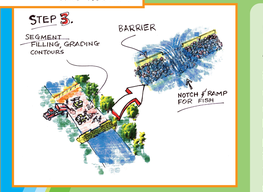
Phase 2
Create a More Natural Streambed



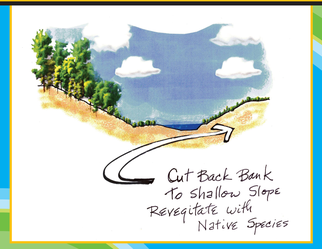








Phase 3
Regrade and Replant Banks



Phase 4
Monitor

- Evaluate project site to determine recontamination rates, water quality benefits, habitat success, and biological response
- 3-year program with annual sampling of capping material, and aquatic and terrestrial habitats
- Decision for future monitoring requirements
- Final report of findings after 3-year monitoring period

Conclusion

The East Chicago Sediment Remediation Demonstration Project strives to achieve environmental sustainability, and to mitigate cumulative impacts to the environment. This project will provide a direct environmental enhancement by managing contaminated sediments, creating a more natural streambed to isolate remnant contamination and to create aquatic habitat, and regrading and replanting the banks to prevent recontamination and to improve terrestrial habitat. This demonstration project will provide valuable information that may be applied to a much larger study of managing contaminated sediment in the IHC/GCR, and possibly to other projects in the Great Lakes AOC. In addition, the proposed demonstration project will build and share an integrated scientific, economic, and social knowledge base. Lastly, the project holds interdisciplinary partnerships with various agencies and organizations, including the U.S. Environmental Protection Agency; Indiana Department of Natural Resources; Indiana Department of Environmental Management; the City of East Chicago, Indiana; The Nature Conservancy; Aquatic Research Interactive; Chicago State University; John G. Shedd Aquarium; U.S. Army Engineer Research and Development Center; and Tetra Tech EM Inc. By holding these partnerships, the project respects and esteems the views of individuals and groups interested in USACE activities, and the remediation of the IHC/ GCR.

Special thanks to:
DNR IDEM

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