CHAPTER 15

CONSTRUCTION AND INDUSTRIAL/COMMERCIAL USE

15-1. Harbor and Port Facilities.

a. The economic potential and social productivity of industrial/commercial activities provide a strong incentive for urban growth and development. These activities have flourished in natural harbors and along urban waterways where raw materials can be received and finished products shipped most economically. Industrial/commercial development near waterways has been aided by the availability of hydraulic fill material from nearby dredging activities. The use of dredged material to expand or enhance port-related facilities has generally received local support because of the readily apparent potential benefits to the local economy. Approval of the disposal operation is generally predicated on the advancement of the port development project and not on the incidental need for proper disposal of the dredged sediments. Traditionally, where disposal has been to advance the industrial development goal, attempts were made to use the dredged material beneficially; where it would not, the material was disposed of by the most economical means available. The key for the beneficial use planner is to identify how, when, and where dredged material from a navigation project can fulfill an economic need, while not overlooking biological beneficial uses and environmental considerations and limitations. Identification of economic or social benefits may help overcome some environmental opposition to disposal sites. Job-producing planned uses in cities with depressed employment are much more likely to gain approval than projects that appear to conflict with basic community needs.

b. There are numerous examples of dredged material sites that were used in harbor/port development. One such facility constructed on dredged material is the Presidents Island-Memphis Harbor Project located approximately 5 miles southwest of Memphis, Tennessee (Figure 15-1). It is a 960-acre site on the southeast side of the island (now a peninsula) filled with sandy dredged material. A slack-water area was created by diking, and an 800-foot-wide by 12-foot-deep channel was dredged and the sediments placed along 3.5 miles of the channel’s north bank. Filling was completed in 1957, and within 20 years most industrial development was completed. By 1973 over 70 separate industrial concerns had bought or leased acreage on the site. A feasibility study of proposed harbor expansion alternatives prepared by the Memphis District recommended that a second harbor channel be dredged at Presidents Island and the material placed on the island along the new channel’s south bank. This proposal would create an additional 1,000 acres above the floodplain for port and related industrial/commercial facilities. When the first facility was completed, there was little concern for the wetlands that were covered up. Expansion plans must take these wetlands into careful consideration.

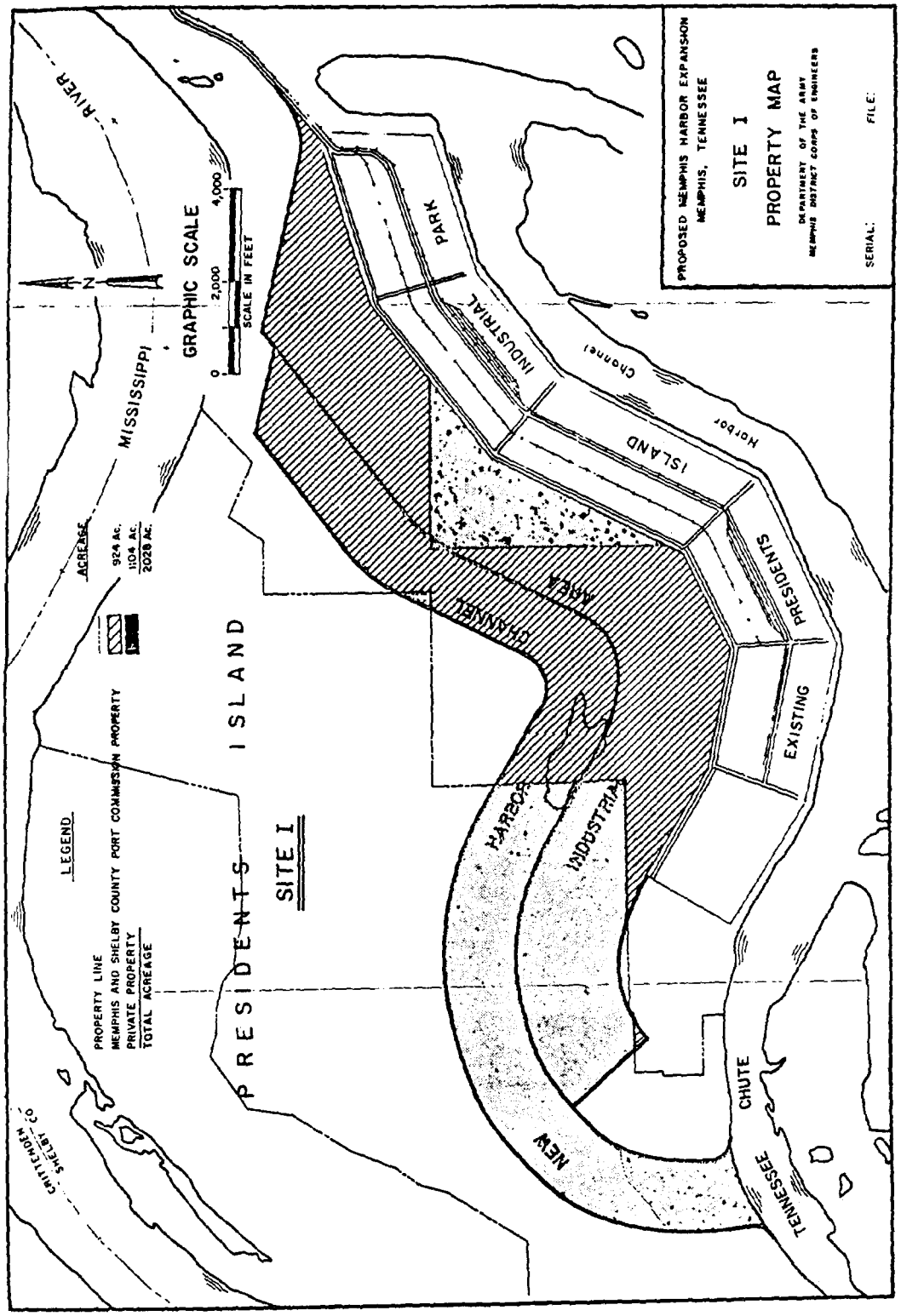

Figure 15-1. Presidents Island-Memphis Harbor Project

c. In dozens of locations in U.S. rivers, dredged material is used for such benefits and for creating foundation above the floodplain for grain elevators, shipping terminals of all types, barge-fleeting areas, and storage facilities for U.S. products waiting to be moved to market (coal, timber, agricultural products). Two examples at Portland, Oregon, a container facility and a grain elevator located at convenient shipping points, were both built on dredged material (Figure 15-2). Another example is the harbor at Vicksburg, Mississippi, on the lower Mississippi. A large industrial site providing facilities to over 50 industries was built on dredged material from the Yazoo River (Figure 15-3). Other examples include port and shipping facilities at Texas City, Galveston, and Houston, Texas, in Galveston Bay; port facilities in the Duwamish River in Seattle, Washington; and facilities at Blakely and Brookley Island complexes in upper Mobile Bay, Alabama.

15-2. Residential and Urban Use. In spite of the sometimes poor foundation qualities, dredged material containment areas have become sites of multiple-building high- and low-rise residential and business complexes. Success has been attained where the properties of the dredged material have been properly accounted for in the residential design. A few examples of residences and businesses built on dredged material include:

a. Almost the entire City of Galveston, Texas, where dredged material has been used for fill, erosion control, hurricane protection, foundation material, and other beneficial uses for at least the past 70 years.

b. Thousands of residences and businesses have been built on sandy dredged material in Tampa, St. Petersburg, Clearwater, Sarasota, Miami, Jacksonville, and numerous other locations in Florida. (Most of these were built in wetlands, and therefore much of this type of development in Florida has decreased significantly in the past 10 years.)

c. Residential areas in the Burrough of Bronx in New York City.

d. Residential and business areas throughout the City of New Orleans, both on the riverfront and on Lake Ponchartrain.

e. A combined use of sandy dredged material over the past 60 years on the Mississippi Gulf Coast for residences and businesses, highway fill, sea wall protection, and beach nourishment (for both recreation and nesting habitat for the least tern).

f. Businesses at Jackson, Mississippi, where borrow material was dredged from inside the Pearl River levee and pumped into place outside the levee for foundation material.

g. A huge industrial/residential/commercial complex, including a marine park, was built on sandy dredged material at San Diego, California (Figure 15-4).

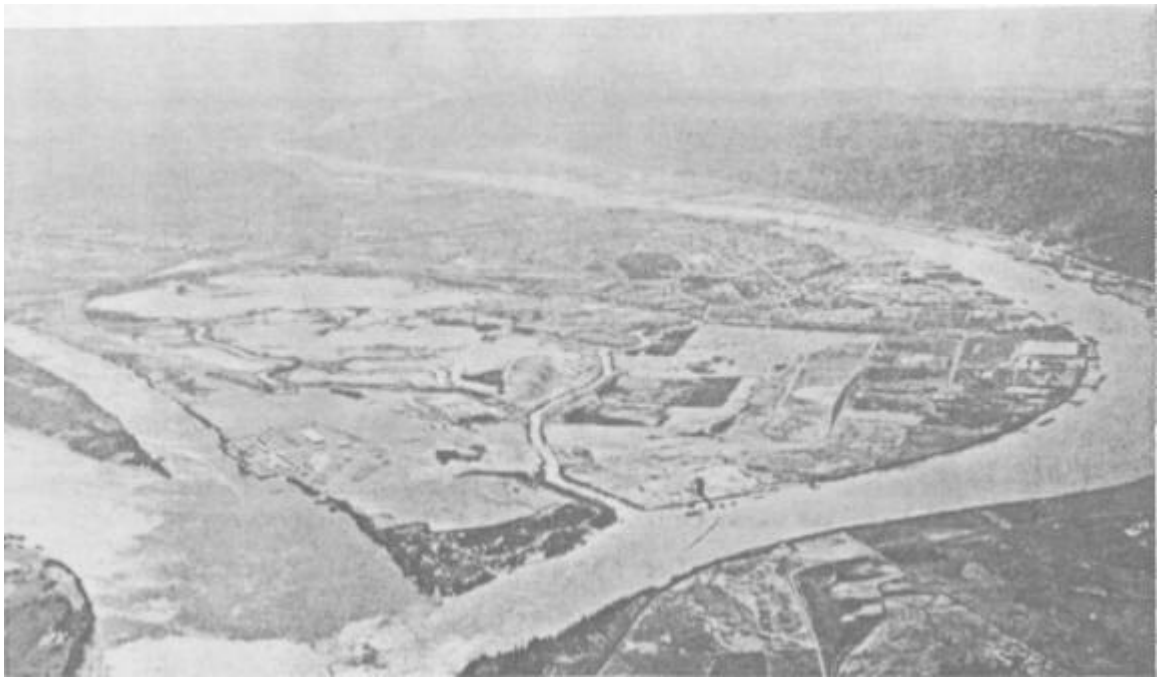

Figure 15-2. Two port facilities built on dredged material at Portland, Oregon, at the confluence of the Columbia and Willamette Rivers. A container port is located on the Columbia (left) and a grain terminal is located on the Willamette (right)

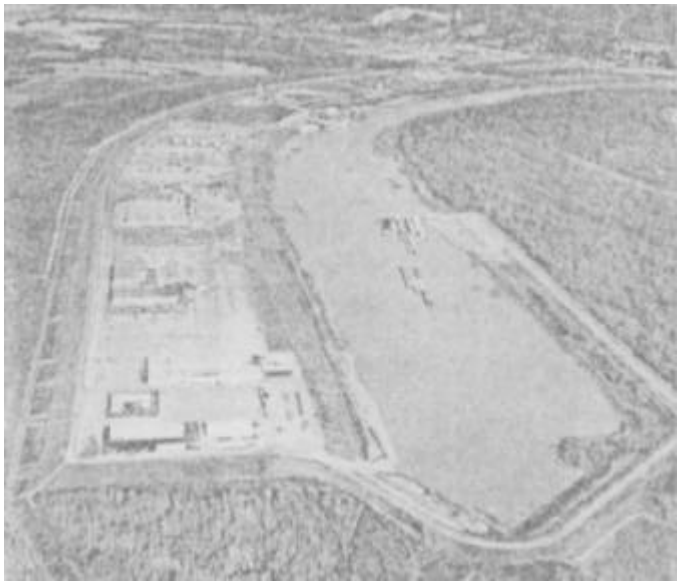

Figure 15-3. The port and industrial park at Vicksburg, Mississippi, which were built from dredged material from the Yazoo River

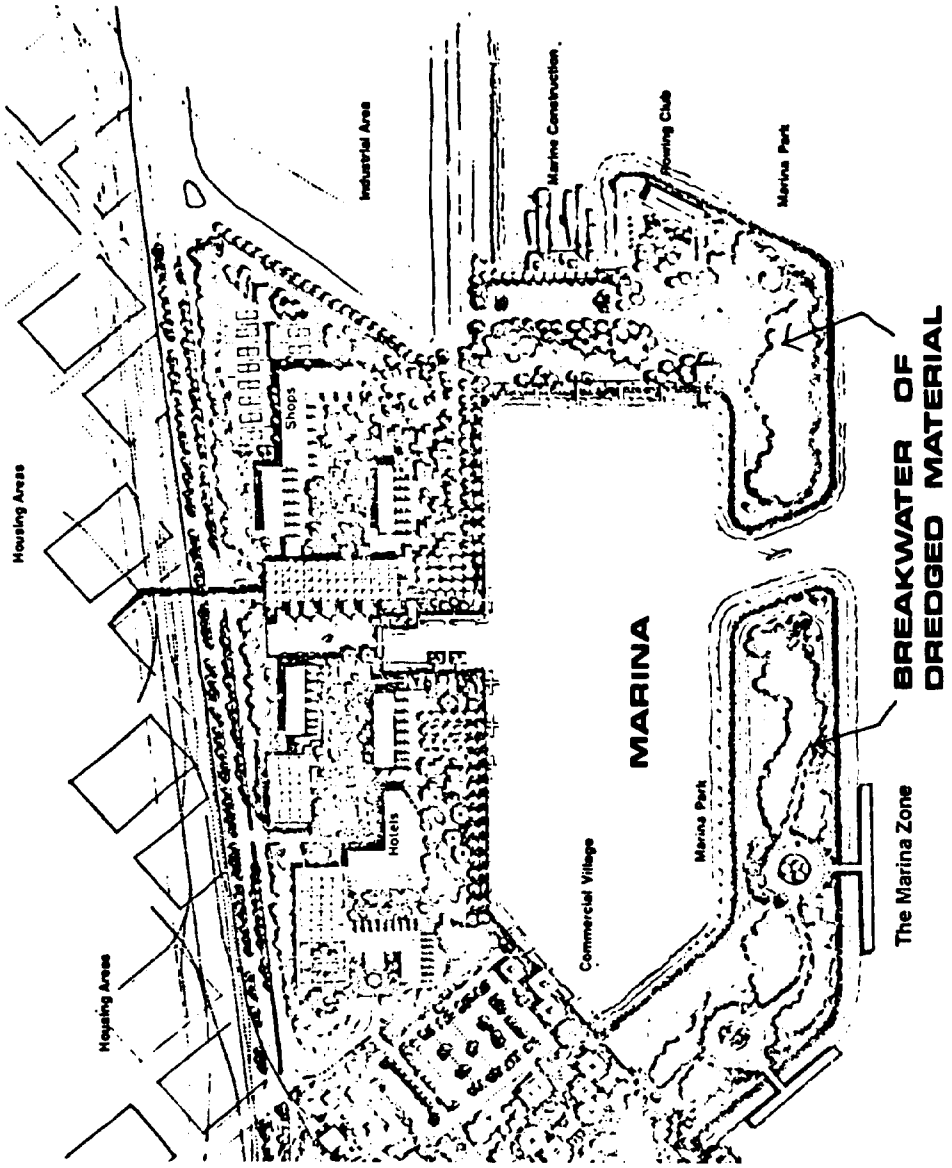

Figure 15-4. The master plan used for construction on sandy dredged material of an industrial/residential/commercial complex, including a marine park, at San Diego, California

h. A large, shopping center complex was built on dredged material at Swan Island on the Columbia River in Portland, Oregon. It included shopping and commercial areas and low-rise office buildings (Figure 15-5).

15-3. Airports. Airport runways and facilities in New York City, New York; Washington, D.C.; Grays Harbor, Washington; Minneapolis, Minnesota; New Orleans, Louisiana; Portland, Oregon; San Francisco, California; Brookley Air Force Base; and a number of other coastal areas have been built on dredged material foundations. These were built in areas where insufficient land was available for a commercial airport, and use of dredged material was easily justified both economically and socially. Such uses of dredged material will undoubtedly continue as harbors and cities increase in congestion and population.

15-4. Dikes, Levees, and Containment Facilities. The CE makes almost constant use of dredged material for dikes, levees, and confined disposal facilities (CDFs). Dredged material, pumped onsite and dewatered, readily lends itself to these uses. By using dredged material to build or increase capacity in CDFs, or for dikes and levees, overall project costs can be reduced while not having to use fastland soil for these projects and by expanding the life of existing containment sites. Some local and state agency and private use is made of dredged material for dikes and levees in certain situations such as for erosion and flood protection, or for private industrial dredged material containment facilities.

15-5. Fill Material and Roads. Thousands of cubic yards of dredged material have been dewatered in holding areas, then given or sold to public or private interests for fill material. This material has been used for a variety of building and parking lot foundation and site capping uses, primarily in urban areas. It has also been used for road construction as foundation material, especially in coastal counties. Often, such material is given away without charge in order to make room in disposal sites for subsequent disposal. In St. Paul District, dewatered sandy material was used to fill in an abandoned gravel quarry that was a dangerous eyesore. These beneficial uses, coupled with minimal handling requirements, make these disposal alternatives inexpensive and attractive.

15-6. Islands and Historic Preservation. On the Mississippi, Louisiana, Alabama, and Florida coasts, historic sites on barrier islands and beaches have been protected from wave erosion and subsidence by sandy dredged material being pumped around and near such sites. Excellent examples are found in Mississippi where the beach front, with its historic colonial and antebellum landmarks, and Ship Island, where historic Fort Massachusetts is located, were restored with sandy dredged material after both were almost totally demolished by Hurricane Camille.

Figure 15-5. A large shopping mall, Port Center, was built on dredged material at Swan Island on the Columbia River at Portland, Oregon. It included shopping and commercial areas, as well as low-rise office buildings.

15-7. Considerations.

a. The use of dredged material as industrial/commercial and construction material requires almost no additional work on the part of project engineers, unless it involves a CE work project, once material has been placed inside a containment facility and dewatered. Users and sponsors of the dredged material site at that point are responsible for moving and handling the material, developing the site, management and maintenance, and all other aspects of industrial/commercial site use. If the dewatered material is to be used for dike and levee construction, normal earth-moving and handling procedures by the CE would apply, and generally would not involve use of a dredge. Techniques outlined in items 17, 30, 62, and 82 are referenced for dike and CDF engineering design and construction. Industrial/commercial use of dredged material is probably one of the most inexpensive beneficial uses. Its primary advantage other than low cost is that it allows greater use of disposal sites when dredged material is removed. Its primary disadvantage is that on sites that become industrial areas, port facilities, airports, and other such commercial ventures, the sites are no longer available for disposal, and other disposal sites must be located and obtained.

b. While there are a number of obvious economic advantages to these types of beneficial uses, the environmental aspects may be so disadvantageous that a project is not feasible. For example, most of these sites already built displaced wetlands and other critical habitats. This can no longer be done without mitigation and stringent permit requirements.