SHADE'S BEACH PARK

HARBORCREEK TOWNSHIP, PENNSYLVANIA

BEACH RESTORATION AND

NAVIGATION IMPROVEMENTS DESIGN STUDY

JUNE, 1989

DER FILE # CZ1: C7E
ME # 67339
Grant Task # 87-PE.06

Coastal Zone

Funded and Coordinated through Department of Environmental Resources, Office of Resources Management, Bureau of Resources Management, Division of Coastal Zone Management and the Erie County Department of Planning.

Prepared by:

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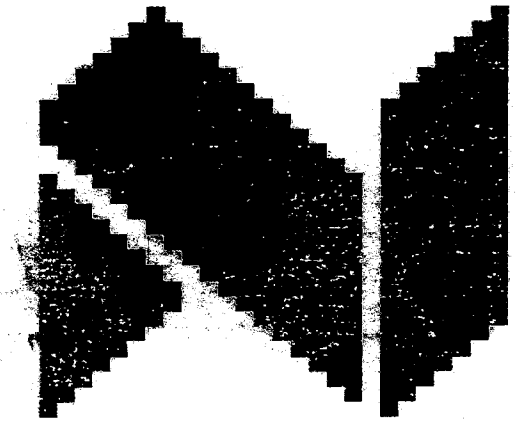

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DESCRIPTION OF STUDY AREA

SUMMARY

Public fishing and boating access to Lake Erie, east of the City of Erie to the New York State border, is severely limited. Private ownership of most of this 20 miles shore line and the natural bluffs limit the number of access areas available in this area of the coastal zone. However, a small tract of land located in Harborcreek Township, Erie County, owned by the Township, is being utilized for limited public access and has been identified as having a potential for much greater use. Redevelopment of the Shades Beach site could significantly increase the public boating and fishing opportunities in this portion of Lake Erie together with providing a beach for swimming and other recreational uses.

A study prepared by Young and Lahr, in 1982 which was funded by the Pennsylvania Coastal Zone Management Program, pointed out that public boating demands on Lake Erie are high. Fishing pressure on Lake Erie has also increased dramatically with the improvements in water quality and the development of an active trout and salmon stocking program. While the existing access facilities provide limited but significant recreational opportunities, they are not adequate to meet the demand for recreational boating and fishing access to Lake Erie waters. This Study defines the Shades Beach site redevelopment as proposed initially by the U.S. Army Corps of Engineers in their 1985 Initial Appraisal Report on Beach Restoration and Navigation Improvements at Harborcreek, Pennsylvania. The chosen redevelopment alternative is both desirable and feasible provided that sources of funding become available.

The redevelopment concept proposed will provide adequate parking and access roads as well as safe shelter, launching and retrieval for small boats (22 feet ± and less). Furthermore, the site will provide recreational swimming and enhance the picnicking and ball fields areas already present at the Park. The site improvements could be phased and the initial investment of $1,645,358 for facilities including a breakwater, boat ramps, parking, service roads, sand beach, user fee toll booth, beach house with comfort station and floating docks would provide most of the desired benefits. This Study indicates that redevelopment of the Shades Beach Park would result in a significant benefit to the fishing, boating public and beach users, particularly those individuals residing close to the eastern shore of Lake Erie. Specific benefits to be realized are:

1. Safe and convenient boat launching and retrieval will be realized.

2. An increased number of boaters and anglers can be accommodated.

3. Adequate parking will be provided.

4. Boating distance will be reduced for anglers to their favorite and productive fishing areas located near the site.

5. An important additional safety consideration is provided since this facility will greatly reduce the time required for a boater to remove his boat from the Lake when sudden storms occur.

6. Driving distances will be greatly reduced for many Lake Erie recreational users.

7. A small sandy beach will be provided which will enhance the overall use of the Park.

CLIMATE

The climate at the Shades Beach Park is strongly influenced by Lake Erie and is typical for the Lake shore within a ten to fifteen mile area. The relatively warm waters of the Lake tend to moderate the daily and seasonal temperature extremes of the air mass moving down from Canada. This prolongs the growing season and limits killing frosts in the fall and spring. The cool breezes off the Lake during the summer add to the attractiveness of the site for recreational use. These same conditions tend to prolong the fall season and permit boating and fishing activity into November, much later in the year than would be expected at an area of this geographic latitude. The average annual precipitation is 37.2", which is relatively evenly dispersed over the year. The prevailing winds, which are mainly from the northwest and southwest, with the former predominating, are capable of creating violent storms with waves reaching heights of 5' to 8' in a very short time. The storms that do the most damage to the shoreline are those from the northwest.

GEOLOGICAL CONDITIONS

The underlying strata of the Shades Beach access area is a veneer of glacial lake deposits comprised of shale fragments, gravel, sand and silt, all resting on bedrock of Northeast Shale. Northeast Shale is a thinly bedded silt stone of marine origin from the late Devonian Age. Few fossils are contained in the Northeast Shale layers. This shale tends to break up as flaggy or platey pieces, while the interbedded clay shale tends to break up as chippy or hackley fragments. The Northeast Shale beds are near horizontal and are not folded or faulted to any measurable degree.

BLUFF STABILITY & RECESSION

The Shades Beach Park site is located along a coastal section of Lake Erie which is subject to light erosion problems according to the International Lake Erie Regulation Study Board's Report on the Regulation of Lake Erie Water Levels, which was prepared in 1981. A survey conducted by Coastal Research Associates, Inc., titled A Geotechnical Investigation of the Coastal Bluffs of Erie County, PA concluded that the recession rate of the bluffs in the site area is minimal. The rate of bluff recession is approximately one-half to 6 inches per year. The major reason given for such a low rate of bluff recession is that the bedrock of underlying shale, which is well exposed along much of this coast, protects the bluffs by absorbing wave energy. Harborcreek Township has a Bluff Setback Ordinance which limits development in such areas.

SHORELINE STABILITY

The existing beach area is now littered with cobbles due to a severe storm. This beach was once a mixture of fairly clean sand, shale and cobbles but only the cobbles remain on the surface of the beach at this time. Beach depth is generally shallow because the bedrock lies only a few feet below the surface. Reference is made to the soil report conducted by John Cernica & Associates which is included in the Appendix of this Study.

The eastward littoral drift along the Lake Erie shore, which is caused by prevailing winds, tends to cause beach accretion on the western side of the existing groin and beach depletion on its eastern side. The proposed breakwaters, which shall extend out into Lake Erie approximately 300' from shore, will aggravate the condition of deposits caused by littoral drift in the vicinity of the proposed beach. Furthermore, the possibility that some littoral drift accretion could occur at the harbor entrance at the proposed boat launching ramp surrounded by breakwaters was considered during the planning and design of the facilities.

A 125' long detached breakwater is proposed to protect the beach area and to capture sand from the littoral drift to help maintain the beach. However, it is estimated that approximately 70 tons of beach nourishment will be required annually. The nourishment shall be for cosmetic and aesthetic values as well as to replace sand which is depleted, above the water line, due to normal erosion. The detached breakwater and the portion of the

"L" shaped breakwater from shore to the bend shall significantly improve the stability of the shore line in the beach area.

The shore line contained within the breakwaters enclosing the harbor shall be stabilized as a result of the construction. Virtually the entire beach area will be covered with the concrete boat launching ramp with the exception of a minor portion on the westward side within the breakwaters. The shore line East of the breakwaters, in the vicinity of the outlet of Eightmile Creek, will be protected by the harbor structure.

The littoral drift will cause deposition of approximately 1,000 cubic yards of material in the vicinity of the detached breakwater and beach area. An estimated 50 cubic yards of accretion is expected at the harbor opening on an annual basis. These projections are based upon conversations with personnel from the U.S. Army Corps of Engineers, Buffalo District. All deposited material must be removed and placed back into Lake Erie on the west side of the proposed breakwater project. The cost for this annual activity of removing deposited material has been included in the operation and maintenance budget for the overall project. This removal and replacement of deposited material captured by the breakwater construction is necessary to avoid shore line problems east of the project area.

Serious consideration was given to extending the "L" shaped breakwater on an angle towards shore to eliminate deposition of material at the mouth of the harbor. Due to the close proximity

of the outlet of Eightmile Creek to the harbor entrance, this is not considered to be feasible in this case. A breakwater extension to protect the harbor opening from accretion would most likely trap sediments moved by Eightmile Creek into Lake Erie and have the opposite affect of its intended purpose. Thus, with the relatively minor amount of accretion that must be removed annually from the harbor entrance, compared to the more significant amount of accretion which must be removed from the beach area, it is cost effective to allow some accretion at the harbor entrance and its subsequent removal.

Construction of the access road improvements should not adversely effect the shoreline, bluff or down drift erosion. The access road penetrations through the bluff are contained within the area protected by the proposed breakwaters. Thus, it is believed, any effect of bluff stability, shoreline erosion and down drift erosion will be mitigated by the protection afforded by the harbor rubblemound breakwater.

SOILS

The soil information for this study was obtained from the Soil Survey, Erie County, PA, prepared by the U.S. Department of Agriculture, Soil Conservation Service (SCS). A soil map has been included in the Appendix of this Study and indicates the distribution of soil types on the property site.

Beach & River Wash (Ba). This miscellaneous type is made up of unassorted sand, gravel and small fragments of flagstone. These soils are a result of the outlet of Eightmile Creek immediately east of the proposed project. Some of the larger beaches along Lake Erie are located near the mouths of streams that empty into the Lake. In some areas there are narrow beaches along the entire Pennsylvania Lake front. River wash forms temporary islands or bars in or along streams that have steeply sloping beds. Before sediments are deposited on the beach, they are transported by streams and are then dropped into the waters of Lake Erie. There they are reworked by wave action and are then washed onto the beach. During storms the beach material is again reworked and is carried eastward by shore currents. In its place new sediments are deposited by waves. During the winter a well defined beach is often altered greatly by storms.

Beach and river wash is not stable enough to maintain a cover of plants. It consists largely of material weathered from the underlying shale. It also includes some sediments of sand-

stone, granite and quartzite that were carried into the area by glaciers. No soil profile has been developed.

This miscellaneous land type has no value for agriculture but it provides valuable areas for recreation. The affects of beach depletion can be minimized by installing structural protection through non-structural means such as replenishment with similar beach materials.

Birdsall Silt Loam, 0%-2% slopes (BdA). The profile for this soil is a very poorly drained to poorly drained silty and deep material. They are inextensive and occur in small, level to gently sloping areas. The parent material was Lacustrine deposits of glacial origin consisting of stratified silt and clay, mixed with some sand, laid down in still or slack water. Birdsall soils are slowly permeable to air and water.

Surface and internal drainage are very poor. During wet seasons shallow water remains in the depressions for several weeks. Included with this mapping unit are a few small areas of Lorain silty clay loam and Lorain clay, which are not mapped separately in Erie County. These include soils that are very poor drained, in the lower part of the profile is calcareous. This soil, unless improved by drainage, is best suited to permanent sod or woodland.

Berrien Fine Sandy Loam, 15%-25% slopes (BcD). The profile of this soil is similar to that of the Berrien Series except the surface layer is only 6" thick. The soil has uniform slopes that

are mostly less than 200' long. Surface drainage is good to excessive and internal drainage is moderate.

The parent material was acid, lacustrine sands that were sorted and deposited by water. These soils are low in clay, consequently plant nutrients leach downward readily. A firm layer, or pan, that is slowly permeable to air and water is 20"-30" below the surface. At depths of 40" to 72" is gray calcareous material that is also slowly permeable to air and water. When saturated with water, this material is known locally as quicksand.

Escarpments (Ec). This miscellaneous land type occurs on steep slopes that have formed as a result of stream cutting or Lake shore erosion. The areas are on the Lake Erie plain and on terraces. In general, the slopes range from 30% to 60% and are between 50' and 200' long.

The degree of erosion varies. The top of the escarpments have a cover of soil but, at the bases of eroded slopes, there are outcrops of rocks. In some places the soil material is underlain by quicksand.

Northeast Shale. Northeast Shale is a thinly bedded medium light gray silt stone interbedded with medium gray shale. It tends to break up as flaggy or plately pieces, while the interbedded clay shale tends to break up as chippy or hackley fragments. The Northeast Shale beds are very close to horizontal and are not folded or faulted to any measurable degree.

Preliminary investigation of the depth to shale bedrock was made as a part of the report prepared by John N. Cernica & Associates for this project. The soil probing and analysis was contained above the shoreline to aid in determining excavation and rubble mound breakwater quantities for the engineer's construction estimate. It was beyond the scope and budget of this report to analyze the bearing capacity and layer depth of the shale upon which the rubble mound breakwater would be supported. Research was made into the cost to obtain a barge and drilling rig and to investigate the bearing capacity of the shale layer to support the breakwater. The estimated cost ranged from $20,000 to $25,000 according to Linniger Drilling & Pumps Company, Inc., Greenville, PA and John N. Cernica & Associates of Youngstown, OH. The reason the costs are so high is that a barge would have to be rented and set up over each boring location and this expense was prohibitive under the line item budget for foundation investigation.

It is deemed essential that a full analysis of the bearing capacity of the shale, which would support the breakwater, be conducted prior to construction. It must be ascertained whether there is adequate bearing capacity of the shale to support the loads. No construction should take place until this has been accomplished.

VEGETATION

Immature scrub woodlot extends from Pennsylvania traffic Route 5 almost to the bluff overlooking Lake Erie. It is young, dense woodlot covering both sides of Eightmile Run and is made up of numerous immature tree species: Sumac, Maple, Slippery Elm, White Birch, Eastern Cottonwood, Quaking Aspen and White Pine. Intermingled in the higher tree species there is a dense ground cover, consisting primarily of thistles, scrub brush, shrubs and wild grapevines. There is also an area of cleared field consisting of a grassy knoll with a few, large, more mature deciduous trees. The remainder of the property is bluff and beach, an area of little or no vegetation.

TRANSPORTATION

The principal arterial roads in the vicinity of Shades Beach are Interstate Routes 79 and 90, which make this site readily accessible not only from Pittsburgh and northwestern Pennsylvania, but also from neighboring Ohio and New York. Other arterial roads serving the access site are Pennsylvania traffic Routes 89 and 5, U.S. traffic Route 20 and U.S. Route 17. Pennsylvania traffic Route 5 borders the property. Numerous local public roads also serve the property. These connect Route 20 and Route 5. The accompanying vicinity map, found in the Appendix, shows the larger connecting roads for the Study area. The location map indicates the local road system and its relationship to Interstate 90 and Pennsylvania traffic Routes 5 and 20.

UTILITIES

The site currently has access to gas, electric and telephone service. New potable water and sewage services would be required at the project site to meet development needs. These services could be provided by constructing a new well and sewage system in the Park rather than use public utilities. Public sewer is several miles distant as is a public water supply. To extend these utilities into the Park would be excessively expensive.

There is no foreseeable need to provide gas service to the site. However, new electric and telephone service would be desirable for the convenience of the users. Telephone service would provide a certain safety aspect to the site and allow communications between the user fee collection booth and the Township to aid in coordination of activities. Lighting of the beach, boat launch area and parking lot would be highly desirable but a lighting feature was not included in the plan due to cost considerations.

HYDROLOGY

There are no intermittent or continuous streams crossing the Shades Beach Park. There is a culvert which collects the runoff from the bluff area directing it immediately west of the "L" shaped breakwater out to Lake Erie. Eightmile Creek is immediately east of the Park area and captures a portion of the site runoff. Presently, a substantial amount of runoff follows the roadway through the bluff which terminates near the existing groin.

The designated flood plain is the beach area and a narrow strip of land along Eightmile Creek. Any additional runoff created by the proposed project can be directed either to Eightmile Creek or directly to Lake Erie by pipe and will not create flooding problems. So long as such waters are not directed over the bluff face or surface, no erosion or bluff stability problems are anticipated.

WILDLIFE AND FISHES

The Lake Erie waters and shore line in the vicinity of the proposed Shades Beach improvement project are inhabited by a diverse fish and wildlife fauna. Regional tributary streams, near the site, are stocked annually with non-native Coho Salmon and/or Steelhead Trout by the Pennsylvania Fish Commission and area sportsmen cooperative nurseries. These streams include Twentymile Creek, Orchard Beach Run, Sixteenmile Creek and Twelvemile Creek, all located east of the project site. Other non-native salmonoids stocked in tributaries further west on Pennsylvania shore line and to the east in the New York waters of Lake Erie are Chinook, Salmon and Brown Trout.

Lake Trout, which are native to Lake Erie, are also being stocked each year in the main lake near the New York-Pennsylvania border in a cooperative effort amount the Pennsylvania Fish Commission, New York Department of Environmental Conservation and the U.S. Fish and Wildlife Service. With the exception of the Lake Trout, each of the salmonoids are anadromous, and can be found in large numbers near shore during the fall as they return to the tributary streams to spawn. Steelhead trout continue to enter the streams through the winter, with a second, larger spawning run peaking in the spring. During the summer, all the salmonoids congregate in the deep cold waters located several miles offshore at the point known as the "Mountain".

Other fish species inhabiting the waters near the study area include Walleye, Yellow Perch, Smallmouth Bass, White Bass, Freshwater Drum, Rock Bass, Brown Bullhead, Channel Catfish, Stonecat, Carp, White Sucker, Redhorse Sucker, Rainbow Smelt, Emerald Shiner, Spottail Shiner, Trout Perch and Gizzard Shad. It is likely that White Perch, White Fish and Turbot also venture through the region periodically. Numerous other lesser abundant species can also be found in these waters.

Two species of fish which have been collected in the general area from Presque Isle Bay east to the New York State line are listed by the Commonwealth of Pennsylvania as threatened and endangered. The Eastern Sand Darter is listed as threatened and the Lake Sturgeon is listed as endangered. Any redevelopment activity at the site is not anticipated to cause any significant impact on either of these species.

Many species of water fowl can be seen intermittently in the waters adjacent to the study area, particularly Canada Geese, Red Breasted Merganser and various duck species such as Scaup, Canvas Back, Redhead, Ring Neck, Golden Eye, and Buffle Head. Ring Billed Gulls, Herring Gulls and Common Turns are abundant as well as various shore birds including Sandpipers and Killdeer. The shore line of the study area is characteristic of the first stages of succession of cultivated land with its annuals, briars, Sumac and Cottonwoods, and is inhabitated by numerous song birds and probably Woodcock and Ringed Neck Pheasant.

Mammals inhabitating the shore line in the study area year round include Cottontail Rabbits, Woodchucks, and other small rodents and insectivores such as Moles, Shrews, Voles, Mice and Woodrats. Other mammals which probably pass through the area are Oppossum, Skunk, Raccoon, Mink, Weasel and White Tail Deer. The area is also marginally suitable as Squirrel habitant.

The area adjacent to Eightmile Run which is immediate east of the property provides suitable habitat for various frogs, toads, salamanders, snakes and turtles. One specie of reptile, the Blandings Turtle, is classified by the Commonwealth as endangered. It has been collected recently east of the Borough of North East, however, any redevelopment activity at the site would not be expected to significantly impact this species.

Because of the small size of the study area and the transient nature of most of the fauna which inhabit it, development of the proposed facility should cause minimal detrimental impact on the existing fish and wildlife. A small but insignificant amount of spawning habitat for shallow water spawners such as Smallmouth Bass, Yellow Perch and Rock Bass could be disrupted. Eightmile Creek is not accessible to andramous salmonoids and provides no spawning habit for any other Lake Erie species. This is due to the small waterfall and bluff at the mouth of Eightmile Creek making upstream access near impossible for such species. The region is not suitable as a nesting area for water fowl, but serves primarily as a feeding and resting area. As such, any impact on water fowl is likely to be beneficial as the proposed

breakwater will provide protection during the late fall and early spring when boat use will be minimal and water fowl migration is at its peak. Potential impacts on the resident mammal population can be minimized by leaving a buffer zone between the parking area and the lands to the east, west, and south to traffic Route 5. These buffer zones would consist primarily of the present forested areas.

PUBLIC DEMAND FOR FISHING & BOATING ACCESS

Pennsylvania Lake Erie waters receive high levels of recreational angling and boating use. Erie, Pennsylvania's third largest city, is located near the center of the State's shore line, and Pittsburgh, the State's second largest city, is located 130 miles south of the Lake with direct access by way of Interstate Route 79. An angler and boater survey conducted by the Pennsylvania Fish Commission revealed that approximately two million hours of recreational angling and boating use were expended on the State's Lake Erie waters from June 1981 through May 1982 (Young and Lahr, 1982).

Anglers traveled to the Lake from 51 of the State's 67 Counties, 29 States and Washington, D.C. The vast majority of this use (1,866,200 hours) occurred in the waters situated between the East Avenue launch ramp located in the City of Erie and the Ohio State line. These west side access areas are often over-crowded, particularly during the fall salmon and trout season. The major reason for this is that adequate and safe boating access east of East Avenue launch ramp is severely limited. Presently, the only public boating facilities in this eastern region, which constitutes nearly 30% of Pennsylvania's 43 miles shore line, are located at Lakeside Park, Shades Beach, Twelvemile Creek and the existing facility at North East. The existing deficient launch ramps at Shades Beach and North East, which are similar in design, are unprotected from the main Lake and can be used at times of minimal wave action. Launching and

retrieval, which must be done one boat at a time, is slow, laborious and dangerous, particularly during sudden storms which may occur on Lake Erie. The ramp at Twelvemile Creek, which is also unprotected, is in very poor condition and is often impossible to use. The nearest protected harbors are at Presque Isle, eight miles to the west and at Barcelona, NY, 20 miles to the east of the Shades Beach site.

The Shades Beach area is a prime location for angling, although most is available only by use of a boat. Some shore angling is presently done, but the physical nature of this site and the lack of suitable fish habitat within casting distance does not encourage shore fishing, particularly for more important game fishes. Walleye, Coho and Chanook Salmon, Steelhead, Lake Trout, Yellow Perch, Small Mouth Bass and White Bass are abundant in the waters off the site during the spring, summer and fall. Salmon, stocked annually in tributary streams located near the site, are abundant relatively near shore during the fall spawning run, as are Steelhead Trout which are available from fall through late spring.

A plan entitled "Strategic Plan for Lake Trout Management in Eastern Lake Erie" was developed during the early 1980's by the Lake Trout task group for Lake Erie under the Great Lakes Fishery Commission. This plan was initiated primarily by Pennsylvania and New York to replenish stocks of Lake Trout in the deeper waters of Eastern Lake Erie from Presque Isle eastward to the

general area of Angola, NY. Approximately 150,000 Lake Trout yearlings supplied by the U.S. Fish and Wildlife Service were being stocked in this portion of Lake Erie by helicopter each spring. The ultimate objective is to stock up to 400,000 yearlings annually, with the expectation that at least 50% of this number will eventually be provided through natural recruitment.

The overall objective is to attain an annual adult population of 200,000 Lake Trout by the year 2000 to approximate the size of the stocks that early records indicated were available in the 1880's. An angler exploitation rate of up to 30% is anticipated, which extrapolates into a very significant addition to the fishery available nearby the Shades Beach study site. These deep off-shore waters are also inhabited by other salmonoids during the summer and can be pursued by boating anglers equipped with down-riggers. Each of these species is highly preferred by Pennsylvania's Lake Erie sport anglers (Young and Lahr, 1982).

The proposed facility, which could accommodate boats of up to 25' in length, would allow anglers to launch at this location and avoid a 20 miles round trip boat distance from the Erie area.

In conjunction with this overall eastern base and fishery, there is an apparent need for mooring sites for charter boats which also must make the long trip from the Erie area to the deep water to utilize the summer and fall fishery. Unfortunately, the Shades Beach Park site is not conducive to building a mooring site on the basis of benefit/cost ratios and economics.

Fishing license sales, both Statewide and in Erie County, have drastically increased over the past decade. Likewise, boating registration in the State and Erie County have more than doubled since 1968. These trends are expected to continue and will cause increased pressure on the existing limited boating and fishing facilities.

An inventory of fishing and boating facilities for Lake Erie along the Pennsylvania shore line may be found elsewhere in the Appendix. Although this inventory in itself does not address the specific needs for boating and fishing facilities, it does illustrate graphically that the ratio of existing facilities per mile of shore line is substantially less for the area from the City east to the New York State line than the area from Erie west to the Ohio State line. Specifically, there are two times as many public car stalls per mile to the west as compared to east, 1.4 times as many public car/trailer stalls per mile to the west and there are 5.3 times as many public launch ramps to the west than to the east. This last item is even more significant as it is the presence of protected launch ramps which increased boating safety by providing better and quicker boat retrieval from the Lake when storms occur. This inventory was taken from "Feasibility of Boating Access Development on Lake Erie, North East Township, Erie County", which was prepared by the Pennsylvania Fish Commission, Bureau of Fisheries and Engineering, in December of 1983.

SITE

The primary reason supporting further development of the existing access area at Shades Beach Park are its location, the area's need for public access facilities and the site's public ownership, recreational zoning and immediate availability.

The location is readily accessible to local and non-local users from main highways and it lies approximately half way between Erie and Barcelona, NY where the greatest need for safe access to the Pennsylvania waters of Lake Erie exists.

The site is presently zoned and used as a public recreational facility and no changes are anticipated. Because of its apparent public ownership, a redevelopment project could be implemented at an early date as no land acquisition efforts for land use zoning changes would be necessary. A title search is recommended to verify public ownership.

The difficulties of access development at the Shades Beach Park navigational improvements and beach restoration project are common to most shore front lands east of Erie. They are: (1) existing high bluffs, (2) shallow Lake water depths, (3) rough fast moving storms on Lake Erie, (4) the prevailing northwest winds, which at times cause a set up that is a tide-like phenomena which can raise water elevations two to three feet on the east end of the Lake, (5) possible beach accretion to the west and depletion to the east of any structure in the Lake which may cause maintenance expense and (6) channel dredging which may be needed at the breakwater entrance to maintain adequate water depth also may cause a continual maintenance expense.

An existing roadway through the bluff on the immediate east edge of the proposed harbor will provide a convenient access point to the boat launch ramp. Traffic movements will be critical during times of peak boat launching activity, as well as their retrieval, and it is apparent that a separate exit, through the bluff, must also be provided. Peak day usage of the boat launch ramp was estimated to be 600 total movements including launching and retrieval. The traffic pattern necessary to accommodate these movements dictates that the exit maneuvers from the boat launch ramp not interfere with the entrance movements. A partial pathway is already existent in the bluff at the point where the proposed launch ramp exit would be located.

The final design of access roadways and parking was not a part of this report and the accompanying plans and specifications for beach restoration and navigational improvements. However, a conceptual scheme had to be developed in order to provide budget information regarding benefit/cost ratios together with logistics of vehicular movement to and from the boat launch ramp. A sketch of the parking facility and access road improvements may be found elsewhere in this Appendix.

The shallow water depth of Lake Erie is manifested at the Shades Beach Park boat launch ramp. Soundings were taken throughout the proposed site for the breakwater and the related areas. A contour map was developed and this is included in the drawings. During times of extreme low water levels on Lake Erie, it will be difficult if not impossible to launch craft with

significant displacement. A profile is indicated on the construction drawings of the floating docks with relationship to the low and high water data and the bottom of Lake Erie at this point.

Accretion caused by littoral drift and the resulting operation and maintenance costs have been considered for the project. It has been estimated that in excess of $10,000 per year will be expended by the Township to relocate the accretion which would occur near the beach and to redeposit this material immediately east of Eightmile Creek. This cost figure also includes the necessary channel dredging needed at the breakwater entrance to maintain an adequate water depth. These costs have been included in the benefit/cost ratios for the project.

In addition to the access road and parking improvements, other site specific details are needed to take full advantage of the proposed navigation and beach improvements. In order to recover costs of constructing the facility, a user fee charge must be assessed. Therefore, a collection booth or shelter must be constructed to accommodate the individuals who will be collecting the launch ramp fee. A beach house is necessary to allow for changing and showers. Sanitary facilities would also be incorporated at the beach house with on-site sewage disposal.

Another consideration should be the lighting of the boat launch area and parking lot. A picnic pavilion would be desirable as would be playground equipment and turf recreation areas.

The existing picnicking facilities could be expanded upon and improved. None of these details have been included in cost estimates nor are they necessary to the navigation improvement and beach restoration project.

Access roadway improvements include new gravel base and a double surface treatment of chip and seal. The parking lot would be a gravel surface structure. The access and parking construction would require some maintenance on behalf of the Township. Costs for such maintenance have been included in the project budget. Although it would be desirable to have a bituminous surface on both the access road and parking lot it is not deemed cost effective at this time.

With proper consideration of the specific points discussed in this site analysis, the location was found to contain no significant obstacles to develop. The concept for rubble mound breakwaters and the associated boat launch ramp and beach were based upon the U.S. Army Corps of Engineers' report for Section 103 and Section 107 Initial Appraisal, dated August 21, 1985, at Harborcreek, PA. Options considered in that report led to the design concept indicated on the drawings and discussed in this report.

HARBOR DESIGN

The harbor opening is proposed to face east, since easterly winds occur only 5% of the time. This orientation should provide the greatest protection from storms and sedimentation in the launching area and harbor mouth. The configuration of the harbor area was planned so that the maximum protected water area is achieved with the least length of breakwater.

Floating docks with bridges and bulk head abutments are deemed essential to allow the necessary boat movements to coordinate with the vehicular traffic patterns and flow to accommodate peak day usage. Each launch lane is 15' wide and five series of floating docks each serves two launch ramps. Launch cycling, during peak use days, shall require full utilization of all ten launch lanes. Forty feet of floating dock will accommodate two boats in each lane. The boat closest to shore would be launching while the boat, in the same launch lane, previously launched would be moved out towards the water end of the floating dock while the vehicle and trailer is being parked. This allows launchings to occur at approximately 15 minute intervals to accommodate the full 600 launch/retrieval movements per day during peak day use. Retrieval movements would be similar where the boat in a launch lane nearest to shore would be awaiting arrival of the pickup vehicle and trailer allowing room for another boat to pull up against the floating dock.

Both the proposed access and exit roads from the boat ramp area are partially protected by the proposed breakwaters. A small amount of shore protection at these road entrances to the harbor may be necessary. Rip-rap may be used to protect the built-up roadway near the launch ramp.

SANITARY FACILITIES

Sanitary facilities can be provided near the parking area and boat ramp. It is envisioned that these facilities would be a part of the proposed beach house. A single structure with separate usage area for men and women would probably be the cost effective solution. They could be equipped with flush waste facilities, shower and sinks. Since a public water supply is not available at the site, a low yield well and distribution system could be developed.

Heaviest use of the proposed sanitary facilities is expected on weekends during the summer and fall with peaks during the salmon fishing season in late summer and early fall. Holiday weekends would undoubtedly result in highest usage of park features.

For design purposes we estimate a maximum average daily use of approximately 750 persons. The following minimum number of fixtures are recommended for the public restrooms and beach house:

Men:	1 Flush toilet enclosed booth
	2 Urinals
	2 Sinks
	2 Shower stalls
Women:	3 Flush toilets enclosed booths
	2 Sinks
	2 Shower stalls

Because public sewerage facilities are not currently available and on-lot disposal is probably not a viable alternative,

for purposes of this study sanitary facilities could be either of two options. A self-contained trailer unit, encompassing a beach house and sanitary requirements, including vacuum pump and holding tank could be utilized. The contents of the holding tank would be periodically emptied and removed to a facility approved by the Erie County Department of Health. The other option is to construct a small aerobic treatment system consisting of a packaged plant installed below ground and discharging its effluent through sand filters ultimately to Eightmile Creek. This system would be similar to those installed for small commercial enterprises where no sewer system exist to serve such a development.

PHASING

Phase I

The first activity should be the financing of the project because without funds to support the construction, this project will not become a reality. It is unlikely that the Township could afford to make the improvements without the assistance of grant monies. Thus, all sources of potential revenue must be explored including Section 103 and Section 107 Federal Funding Assistance which this project is categorically eligible to be funded under. It appears that other sources of revenue will also be needed in terms of grants and loans to retire more than $600,000 of debt to be incurred and recovered by user fees. Refer to the FUNDING paragraph found at the end of this Section in the Report.

Phase II

The second phase of the project would be to survey and design the roadway and parking lot improvements. At this time the beach house and user fee toll booth would also be included in the design work. It is believed that this design effort will be necessary in order to assure Section 103 and 107 funding support.

Phase III

The third phase would be to obtain all necessary permits and approvals for the entire project. This includes not only the permits and approvals for the breakwater and beach restoration projects but also for the traveled surfaces, public water and sewage facilities.

Phase IV

This phase should be the construction of the breakwater itself. Although a relatively short construction time table will be allowed for the contractor to install the breakwater, many activities must be undertaken beforehand. Quarry selection, rubble blasting, testing and approvals will undoubtedly take several months. Once the rubble mound breakwater is in place, the area will provide quiet water necessary for other construction activities.

Phase V

The next phase would consist of beach sand nourishment, launch ramp construction, clearing and grubbing, excavation and grading of the access road and parking lot. This will be followed by the building construction and installation of floating docks. Completion of the project would consist of replenishing top soil and seeding of disturbed areas, installing necessary guiderails, signs and other appurtenances.

OPERATION AND MAINTENANCE

After completion of construction and opening of the facilities to the public, an active maintenance program must be implemented. Maintenance costs would probably be borne entirely by Harborcreek township. It is proposed that the daily operation and maintenance duties such as cleaning, cutting grass, opening and closing the gate and policing may be assumed by the Township. The Township would also be responsible for the annual beach nourishment, removal of sediments trapped by the breakwaters and maintenance of the harbor opening. Maintenance of the launch ramp, floating docks, access roads and parking lot are also included in the Township duties.

Total maintenance and operation costs could fluctuate considerably due to a large number of unknown variables. An annual budget figure of $20,000 per year has been established as noted on Page EA-15 of the Appendix. The Township, acting as contractor, has most of the necessary equipment and capabilities to handle the work required with their own staff. It may become necessary from time to time to require the services of a contractor to assist in dredging.

USER CONFLICT

Experience has shown that the only significant conflict between boaters and shore fishermen occurs at times of maximum activity for both uses. At other facilities, according to the Pennsylvania Fish Commission, this has only been a problem during salmonoid season. Since there are currently no significant salmonoid runs close to shore at Shades Beach and into the stream, Eightmile Run, we see no specific potential user conflicts. Should user conflicts occur after development, it is probable that they can adequately be controlled by use of existing regulatory and enforcement authority.

No walkway is proposed upon the rubblemound breakwaters to facilitate fishing activity at this time. It would be unsafe for fishermen to attempt to use the breakwater as an access out to deeper water. Thus, posting the breakwaters will be necessary. If, in the future, a walkway is constructed upon some of the breakwaters, control of user conflict may be necessary.

FUNDING

The results of this study have emphasized that a project as proposed at Shades Beach is financially viable and deserves to be given a high priority. However, there is currently insufficient funding available to initiate the construction and related endeavors. Even if this project were spread out or phased over several fiscal years, the Township could not afford to fund the total development without funding assistance from other sources. Sources which could provide financial assistance are as follows:

Federal

Coastal Zone Management, administered through DER

Section 103/107, administered through the U.S. Army Corps of Engineers

Coastal Energy Impact Program, administered through the Department of Community Affairs

National Park Service, Land and Water Conservation Fund, administered through DER

State

Department of Environmental Resources (See administration functions above)

State Legislature

Local

Erie County
Township of Harborcreek

UPDATE OF U.S. ARMY CORPS OF ENGINEERS INITIAL APPRAISAL REPORT AT HARBORCREEK, PENNSYLVANIA

Northwest Engineering Inc.

Civil Engineers and Surveyors

SUBJECT:

Shades Beach Restoration & Navigation Improvements Design and Engineering Study at Harborcreek, PA, in accordance with the U.S. Army Corps of Engineers' Initial Appraisal Report on Beach Restoration and Navigational Improvements.

AUTHORITY:

This report was prepared under the authority of an agreement between Erie County, PA and Harborcreek Township and done so in accordance with the Statutes, rules and regulations of the Federal, State and local governments. Financing for this study was provided by a Federal Coastal Zone Management Grant from the Pennsylvania Department of Environmental Resources with funds provided by the National Oceanic and Atmospheric Administration.

STUDY PURPOSE & SCOPE OF WORK:

This Planning, Design and Engineering Study addresses the need for the restoration of the Beach Area and development of a safe harbor at Shades Beach in accordance with the U.S. Army Corps of Engineers "Initial Appraisal Report on Beach Restoration and Navigation Improvements at Harborcreek, PA", dated August 21, 1985. The focus of effort has been directed towards a design which is economically feasible under Section 103 and 107 Federal Funding Assistance.

AREA OF CONSIDERATION:

The area studied in this report is the beach and boat launch area of Shades Beach Township Park at Harborcreek, PA. Maps indicating the location of Harborcreek and Shades Beach Township Park are found in the Appendix of this Report. Harborcreek Township is located on the Lake Erie shoreline, about 80 miles southwest of Buffalo, NY and about 15 miles east of Erie, PA. The Township grew from a population of 12,038 in 1970 to 14,644 in 1980.

Shades Beach Township Park is bounded by Lake Erie on the north and Eightmile Creek on the east. The west and south borders of the Park abuts private property. The Park has groves, picnic facilities, playground equipment, a bath house and maintenance building, swimming beach, boat ramp. Photographs of the Park are shown in the Appendix.

R.D. 1, P.O. Box Q, Tidioute, Pennsylvania 16351
Telephone (814) 484-3504

PROBLEM DESCRIPTIONS:

The lake shore in the beach area is characterized by a 70' high nearly vertical bluff with shale base. In general, the shore in this area is without a sand beach except for a small, eroding beach at the study site. Although Presque Isle, a large peninsula approximately 12 miles west of Harborcreek offers miles of beach area, there still exists demand for a local beach. Refer to the Economic Appendix, Page EA-19 for demand justification.

The Shades Beach boat ramp and launch are shown in the Appendix. The ramp is located immediately east of the existing groin. The ramp is composed of concrete with sand and large cobbles present above the water line and the ramp is in generally poor condition. The launch mechanism was a steel dolly on wheels which rolled near the shore line on two rails. The rails were located west of the boat ramp but were subsequently removed due to deterioration and storm damage.

The limited facilities in Harborcreek comprise the only existing public boat launch between the Lakeside Park Boat Launch Ramp in Lawrence Park Township (about 7 miles west) and the Dewey-Western Pennsylvania Beach Access Area in Northeast, Pennsylvania (about 8 miles east). Since the area off shore Shades Beach is an excellent fishing area, there is excess demand for boat launching facilities. Of special interest is "the mountain", a deep (110'-125') depression in Lake Erie five miles off Shades Beach. Around the first of August each year, Coho Salmon congregate in this area and it becomes a very popular spot for the fishermen.

HISTORICAL SHORELINE:

It appears that from 40' to 90' of beach width has been lost since 1939 aerial photography and a 1983 survey of the park. A sketch depicting this shoreline recession may be found in the Appendix.

PLAN INVESTIGATION:

The Army Corps of Engineers, in their August 21, 1985 initial appraisal report, considered three alternatives. Each option consisted of an "L" shaped rubble mound breakwater connected to shore and improvements to the existing groin. One variation of the base concept was to utilize 27 reinforced concrete shanties, which the town of Harborcreek obtained for a nominal charge, which would be filled with concrete and used as the core for the rubble mound breakwater. Another option was identical to the base plan but also would include a detached breakwater and restored beach.

The Corps of Engineers economic assessment was that the "L" shaped breakwater together with the groin improvements, off shore breakwater and beach restoration was cost effective. It is the intention of this report to refine the study regarding the recommended improvements made by the Corps of Engineers in their previous evaluation.

The selected plan includes a 124' detached breakwater and a restored beach, an "L" shaped rubble mound breakwater connected to shore and construction of a rubble mound breakwater over the existing groin. The off shore breakwater and "L" shaped breakwater help trap and sustain a beach. The beach would abut the "L" shaped breakwater and would be 50'wide by 385' long. An initial placement of 1640 tons of sand would be required with an estimated annual nourishment of 70 cubic yards.

The breakwater itself would provide shelter for a new launch ramp. This is detailed on the construction drawings. The construction of launch ramps and related appurtenances are not a permissible federal expense under the authority of Section 107 but a ramp was included so that the breakwater could be sized proportionally. The breakwater crest heights are 6.5' above low water datum (LWD) at the East breakwater, 8.0' above LWD at the "L" shaped breakwater and 7.5' above LWD at the detached breakwater. The East and "L" shaped breakwaters enclose a launch area approximately 70' by 220'.

The benefits and costs of the plan have been refined as a part of this engineering evaluation. The benefit/cost ratios have diminished since the initial appraisal report prepared by the Corps of Engineers. This is due, in part, to the fact that the Corps developed their estimates based upon limited field survey data and, as thus, quantities were subject to conjecture. Also, in developing this final report, associated costs for access road and parking improvements have been included. These associated costs are necessary to make the overall project a viable safe harbor with boat launching facilities which shall require improved access and parking to take full advantage of the launch ramp to meet the anticipated demand projected by the Corps of Engineers.

BENEFITS:

The benefits and costs of the proposed plan were compared to the benefits and costs of taking no action. If no action is taken, the existing boat launch facility would continue to offer some limited recreational opportunities. The town has closed the beach to swimming and shall not open it until the beach is restored. Therefore, under the no action plan, no swimming was envisioned.

The proposed plan would improve recreational boating opportunities and also provide a local swimming beach. Recreational benefits are quantified by assigning an accepted dollar value to a unit-day of a certain quality of recreation multiplied by the

expected number of unit-days of use. The derivation of these benefits is covered in detail under the economic analysis.

COSTS:

The construction cost estimate by the U.S. Army Corps of Engineers, in their 1985 report for this project, was $791,000. This estimate was prepared on the basis of extremely limited preliminary survey data including U.S.G.S. topographic maps and visual inspection of the site. The cost estimates in this report have been based on accurate elevations taken by standard survey methods which result in an accurate quantity takeoff for the navigation improvements and beach restoration portions of work depicted on the drawings.

The current cost estimate includes contractor's plant, labor, materials, overhead and profit at estimated 1989 price levels. The current cost estimate for the project is $1,645,358 including associated costs. This estimate cannot be compared to the Corps of Engineer's estimate since the Corps did not include associated costs in their figures.

The cost estimates for the selected plan are found in the Economic Analysis. The benefit to cost ratio for navigation improvements was calculated to be 1.17 while the beach restoration benefit to cost ratio was found to be 1.29. Refer to the Economic Appendix for specifics regarding derivation of the benefit to cost ratios.

It is unlikely that Harborcreek Township could support the total project cost solely from local funds. Federal funding assistance may be used to offset a portion of the project cost. Specifically, Section 103 and/or Section 107 funding could be used to support the direct costs related to the navigational improvements and/or the beach restoration. Furthermore, other grants could conceivably be obtained to offset a portion of associated costs such as access road improvements, parking lot upgrade and expansion together with other necessary related facilities. This report also assumes, as did the previous Corps of Engineers report, that the boat launch ramp costs would be offset by a user fee. Additionally, a substantial portion of the parking lot improvements was considered in this report to be recovered by user fees.

The analysis of the plan raises a legal question regarding funding under Section 103 and Section 107 because it is both a navigational improvement and beach restoration project occurring simultaneously. This distinction would not cause a problem if each project feature were required for both purposes. In this instance, however, the portion of the "L" shaped breakwater, which runs parallel to shore, and the improvements to the existing groin are not required for beach restoration. Similarly, the detached breakwater and beach fill are not required for navigation improvements. Therefore; the analysis of the plan compares the benefits and incremental costs of a navigation project pre-

suming the beach restoration features are constructed simultaneously. Plan costs are apportioned by purpose so that a benefit/cost justification for each Authority can be prepared. The costs shown for beach restoration include the costs of beach fill, offshore breakwater, the construction of the perpendicular to shore arm of the "L" shaped breakwater and related associated costs for access, parking and facilities related to the beach restoration. Cost shown for navigation improvements are simply the remainder of the costs.

ASSOCIATED COSTS:

In order to realize the navigation benefits to the plan, construction of a boat ramp, access road improvements, additional parking area and a user fee collection booth would be required. The construction cost of these facilities are the associated costs which are the total responsibility of the Township as they relate to Section 103 and 107. Costs such as these, which are not part of the proposed federal project, but which are necessary for the full use of the proposed project, are called associated costs.

Federal guidance requires that associated costs be included in the benefit/cost analysis. However, an offset equal to those costs may be taken if it can be shown that the annual associated costs would be entirely recouped by user fees. In the case of the improvements at Shades Beach, a user fee for launching has been assumed. The fee collected will offset the cost for the boat launch ramp and appurtenances, the user fee collection booth, and a portion of the parking lot improvements.

ECONOMIC ANALYSIS:

Two measures of economic efficiency were used in both the Corps of Engineers study and this report. The first measure of economic efficiency is the benefit to cost ratio (B/C). The B/C ratio is the ratio of average annual benefits to average annual costs. A B/C ratio in excess of 1 implies economic feasibility. The B/C ratios for navigation improvements and beach restoration are 1.17 and 1.29 respectively. The derivation of economic efficiency may be found in the Appendix of this report. The plan, having a B/C ratio in excess of 1, is economically feasible. The other measure of economic efficiency is called "net benefits" and is the difference between average annual benefits and average annual costs. The net benefits for navigation improvements and beach restoration are $9,878 and $16,700 respectively. Refer to the Economic Appendix for the calculation of net benefits.

Accompanying this report are plans and specifications for a specific project which is an element of the overall improvements required at Shades Beach. Detailed are the rubble mound breakwaters, beach sand nourishment, a boat launch ramp with appurtenances and navigational lighting. The estimated costs for this project can be reasonably determined based upon accurate quantity takeoff coupled with estimated costs for each respective work

item. This project includes Section 103, Section 107 and associated costs work. The project does not include access road improvements, parking lot upgrade and expansion and related facilities which would all be associated costs. The non-project costs are based upon conjecture since no detail survey or construction design was prepared for these elements.

The estimated cost of the concrete boat launch ramp, maneuvering area, and floating docks with concrete bulkheads is $355,041. The ramp provides 10 launching lanes, each 15' wide, with each launch area adjacent to a floating dock. The launching area geometrics was dictated by existing topographical features and the need to provide access for all boat movements on peak boating days. The ability to move traffic in and out of the launch area, including both watercraft and street vehicles, was studied to assure the practicality of the entire system.

The Corps of Engineers, in their August 1985 report, noted that Harborcreek intended to charge $1.50 for use of the boat ramp. However, considering additional project costs and inflation since the Corps report, it will be necessary to charge $2.50 for the use of the boat launch to recover the capital costs. The Corps of Engineers expected that there would be 31,230 launches per year based upon their studies. Peak boating days must be accommodated by the boat launch in order to assure that full annual usage can be realized. This, in turn, led to the adding of the floating docks to assure that 300 or more launches (with retrievals) could be accommodated. The Corps originally envisioned 13 launching lanes without docks but this could not be accommodated without diminishing the beach area. Incidentally, the beach is only approximately one-half the area that the Corps of Engineers originally conceived.

Assuming a $2.50 launch fee and 31,230 movements per year, the ramp would generate $78,075 of annual revenue. It is not anticipated that a user fee would be assessed at the beach but it could be used to offset lifeguard or other costs. Annual administrative, operative and maintenance costs will amount to $20,000, including beach sand replenishment costs. Refer to the economic analysis, Page EA-15, within the Appendix, for estimates regarding annual costs. A net $58,075 annual debt retirement payment would be realized if the full theoretical usage of the boat ramp is realized. For example, using $58,075 for the annual payment of debt retirement, an 8.50% for the interest rate, the following principal amounts may be obtained for the time periods indicated:

LENGTH OF LOAN PAYMENT	AMOUNT OF PRINCIPAL
20 Years	$ 549,536
30 Years	$ 624,060
40 Years	$ 657,031

The average annual benefits, benefit to cost ratios and itemized cost estimate for this project, including associated costs which are not incurred with the navigational improvement and beach restoration project element, are tablized on the following pages. Associated costs are included in the benefit/cost analysis, however, an offset equal to the user fee annual associated costs are not included. User fees are assumed to offset a total of $624,060 of the entire project.

AVERAGE ANNUAL BENEFITS

ITEM	AVERAGE ANNUAL BENEFIT
Navigational Improvement	$66,520 (Section 107)
Beach Restoration	$73,785 (Section 103)

NET BENEFITS ATTRIBUTABLE TO:

NAVIGATION IMPROVEMENT	BEACH RESTORATION
$9,878	$ 16,700

BENEFIT TO COST RATIOS

NAVIGATION IMPROVEMENT	BEACH RESTORATION
1.17	1.29

Shades Beach Restoration & Navigation Improvements

ITEMIZED COST ESTIMATE

ITEM	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Project Costs				
(Navigation Improvements)				
Excavation	240	C.Y.	10.10	2,424
Armor and Toe Stone	10,900	Ton	49.30	537,370
Filter Fabric	392	S.Y.	5.30	2,094
Navigation Light Fnd.		L.S.	7,000.00	7,000
SUBTOTAL				$ 548,888
Contingencies (15%)				82,333
Permits, Engineering, Administration & Inspection				45,000
TOTAL				$ 676,221
(Beach Restoration)				
Excavation	778	C.Y.	8.20	6,380
Sand Replenishment	1,640	Ton	7.75	12,710
SUBTOTAL				$ 19,090
Contingencies (15%)				2,864
Permits, Engineering, Administration & Inspection				4,000
TOTAL				$ 25,954
(Boat Launch Ramp)				
Fill	5,286	C.Y.	8.00	42,288
Flatwork Concrete	650	C.Y.	240.00	156,000
Concrete Bulkheads	157	C.Y.	200.00	31,400
Floating Docks	1,650	S.F.	40.00	66,000
SUBTOTAL				$ 295,688
Contingencies (15%)				44,353
Permits, Engineering, Administration & Inspection				15,000
TOTAL				$ 355,041

Shades Beach Restoration & Navigation Improvements

ITEMIZED COST ESTIMATE

ITEM	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
TOTAL OF PROJECT COSTS				$1,057,216
ASSOCIATED COSTS (Access Road Improvements)				
Earthwork	30,000	C.Y.	2.50	75,000
Drainage	L.S.	L.S.	17,500.00	17,500
Base	18,333	S.Y.	4.80	90,302
Surface Treatment	18,813	S.Y.	1.50	28,220
SUBTOTAL				$ 211,022
15% Contingencies				31,653
Permits, Engineering, Administration & Inspection				36,401
TOTAL				$ 279,076
(Parking Lot and Buildings)				
Earthwork	30,000	C.Y.	2.50	75,000
Drainage	L.S.	L.S.	17,500.00	17,500
Base	22,333	S.Y.	4.80	107,198
Fee Collection Booth	L.S.	L.S.	4,000.00	4,000
Bathhouse & Sanitary Facilities	L.S.	L.S.	30,000.00	30,000
SUBTOTAL				$ 233,698
Contingencies (15%)				35,055
Permits, Engineering, Administration & Inspection				40,313
TOTAL				$ 309,066
TOTAL OF ASSOCIATED COSTS				$ 588,142
TOTAL PROJECT AND ASSOCIATED COSTS				$1,645,358

COST SHARING:

The project entities consisting of navigation improvements (breakwaters) and beach restoration (initial sand placement) could theoretically become eligible for both Section 107 and Section 103 Authority Federal Funding Assistance. This funding will require a feasibility study resulting in a detailed project report prepared under the authority of the U.S. Army C.O.E.. The current cost sharing policy for recreational navigation projects (Section 107) is 50% federal funding and 50% non-federal. Section 103 cost sharing for beach restoration, including associated costs, presently provides for a 50-50 percent cost sharing. The current federal rules for cost sharing on these types of projects is subject to change periodically.

For Section 103, beach restoration costs, the federal government will not participate in land acquisition, easements or right-of-way costs. The work directly related to navigation improvements and beach restoration appears to be contained entirely within lands owned by Harborcreek Township and Lake Erie. A title search is recommended to verify Township ownership of lands associated with the project area. Associated costs related to the access roadway improvements will require, as a minimum, grading permits from adjoining property owners in the 300' long section of roadway nearest to the breakwater area. Such grading permits could probably be obtained at no cost to the Township.

Cost sharing is based upon two permutations of federal funding assistance. In the first case, Section 107 federal funding for navigational improvements only has been considered. In the second case, both Section 103 and Section 107 federal funding has been considered for both beach restoration and navigational improvements respectively. The following tables summarize what the federal and local share would be for all Park improvements discussed in this report.

COST SHARING ESTIMATE (SECTION 107 FUNDING)

ITEMS	FEDERAL SHARE	LOCAL SHARE
Section 107	$ 296,464.00	$ 296,464.00
Associated Costs		428,370.00
TOTAL	$ 296,464.00	$ 724,834.00

COST SHARING ESTIMATE (SECTION 107 & 103 FUNDING)

ITEMS	FEDERAL SHARE	LOCAL SHARE
Section 107	$ 159,484.50	$ 159,484.50

Section 103	191,593.00	191,593.00
Associated Costs		319,143.00
TOTAL	$ 351,077.50	$ 670,220.50

In each of the above cost sharing tables, costs recovered by user's fees are estimated to be $624,060. Costs recovered by user's fees are used to offset associated project costs which would otherwise be borne by the Township. Therefore, the total first cost for the entire project is $1,645,358 less $624,060 equaling $1,021,298.

ENVIRONMENTAL CONSIDERATIONS:

Information has been obtained from existing literature and coordination with federal, State and local agencies charged with administering fish and wildlife resources, cultural resources and land use plans in order to characterize the resource base of the project area. Project coordination was initiated in June and July, 1984, by the Corps of Engineers contacting these agencies through correspondence. In February of 1989, these agencies were again sent letters advising them of the proposed project together with conceptual plans of the breakwaters and boat launching facilities.

The U.S. Department of Interior - Fish & Wildlife Service, the U.S. Environmental Protection Agency, the U.S. Department of Agriculture Soil Conservation Service, the Federal Highway Administration, the U.S. Coast Guard, the Pennsylvania Department of Environmental Resources, the Pennsylvania Fish Commission, the Pennsylvania Game Commission, the Pennsylvania Coastal Zone Management Office, the Pennsylvania Historical & Museum Commission and the Erie County Department of Planning were contacted, both in 1984 and 1989. Copies of correspondence received may be found in the Appendix. Most agencies were supportive of the recreational benefits of the project. Major concerns expressed by the various agencies about the project include: consistency with the Pennsylvania Coastal Zone Management Policies; a need for navigational assistance facilities; impacts to littoral drift and associated impacts to fish habitat, erosion and continued fishery access to Eightmile Creek, project construction and maintenance scheduling; adequate fishing access, and use of clean construction and beach nourishment materials. An environmental compliance summary may be found in the Appendix of this report.

The Pennsylvania Historical and Museum Commission initially indicated in their responses that archaeological resources may be affected by the project. They proposed that a survey or limited testing of the area be undertaken to locate potentially significant archaeological resources in their 1984 letter. Their March 8, 1989 letter concluded that a Phase I Archaeological Survey was needed to determine if any on-land or submerged prehistoric or

historic cultural resources existed on the site and, if so, to identify them. Additional information was submitted to the Pennsylvania Historical and Museum Commission and they responded on June 8, 1989. Their conclusion was the the proposed project should not affect National Register eligible or listed historic or archaeological properties.

The present assessment of project implementation benefits realized include: man-made resource, desirable community and regional growth, community cohesion, business and industry, employment and income, public facilities and services, property values and tax revenue, and aesthetics. Probably minor to moderate initial adverse impacts would occur to natural resources, air quality, water quality, noise and aesthetics.

No displacement of people or farms would occur as a result of the project. Adverse impacts are reduced by incorporation of environmental design measures required under contract documents. Continued environmental coordination shall be necessary during the permitting phase of the project to assure minimal negative environmental impact during the construction and operation of the facilities.

LOCAL COOPERATION:

The construction of the project appears unlikely unless Section 107, Navigation Improvements, and possibly Section 103, Beach Restoration, federal funding assistance grants are available. To meet the funding provision of these types of federal assistance programs, Harborcreek Township will be required to furnish certain assurances. The local cooperation agreements document the responsibilities of federal and non-federal agencies for a project such as the Shades Beach Improvement. The specific requirements for local cooperation are found in the Appendix.

CONCLUSION

Based upon the analysis in this report, there is justification for federal involvement in a project at Shades Beach which would include beach restoration and navigational improvements. A feasibility study resulting in a detailed project report, prepared under the authority of the U.S. Army Corps of Engineers, shall be necessary to qualify for Section 107 and/or 103 grant funds. The report prepared herein was funded by a Federal Coastal Zone Management Grant, administered by Pennsylvania Department of Environmental Resources, Coastal Zone Management Division. A portion of this report contains the basic elements required for a feasibility study prepared under COE guidelines. This will minimize efforts to prepare a detailed project report which could result in Federal grant funds becoming available for the project.

There appears to be sufficient demand such that the improved facilities ' overall project costs would be partially offset by a reasonable user's fee for boat launching. Assuming that Section 107 Federal funding for a recreational navigation project could

be captured, and with the possibility of also obtaining Section 103, Beach Restoration Federal grant funds, the local share could be between 40% and 44% of total project costs. Providing that some additional grant funds could be made available, from other entities, Harborcreek Township may be in a position to make a firm commitment to this project.

This study has found, both through inventory and an analysis as well as a review of other current studies, that a strong need for additional boating access facilities are warranted in Harborcreek Township. The options for improving the existing facility have been reviewed. Construction methods and design alternatives have been investigated, the physical feasibility of these proposals have been analyzed and a scheme that is physically valid and workable has been selected. The costs necessary to develop and maintain the proposed facility were examined and found to be reasonable when compared to other similar development costs.

Other important factors are; the study site is apparently under public ownership, no further property acquisition should be necessary, the proposed use is the same as the current use and involves only an increase in the level of that use and the land is presently zoned recreational.

These facts and findings lead us to the conclusion that this site offers definite potential to provide needed boating and fishing facilities together with beach improvements on Lake Erie. Therefore, the following steps should be taken actively to obtain funding for redevelopment of Shades Beach Park:

(1) Conduct a title search to verify public ownership of the Park.

(2) Prepare, under the authority of the U.S. Army Corps of Engineers, a detailed project report to determine if Section 107/103 funding may be applied against project costs. Verify deep water wave heights and period, wave transmission through the breakwater and related diffraction effects. Ascertain whether or not it is essential to extend the breakwaters to the bluff so that they will not become outflanked.

(3) Conduct a full subsurface investigation of the shale layer which will bear the load of the breakwaters. Removal of soft weathered shale, if present, shall be necessary.

(4) Design access roads, parking facilities and appurtenant structures.

(5) Obtain all necessary permits.

(6) Obtain financing (grants and loans).

(7) Construct facilities.

ECONOMIC APPENDIX

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HARBORCREEK TOWNSHIP, PENNSYLVANIA
ECONOMIC APPENDIX
SECTION 103/107

NAVIGATIONAL IMPROVEMENT & BEACH REPLENISHMENT ANALYSIS

NAVIGATIONAL IMPROVEMENT ANALYSIS (Section 107)

INTRODUCTION:

The waters of Lake Erie within the Commonwealth of Pennsylvania are intensively used for recreational boating and boat-fishing. According to the 1985 preliminary report prepared by the Corps of Engineers, nearly two million hours of recreational angling and boating use were expended on Pennsylvania's Lake Erie waters from June 1981 through May of 1982. The vast majority of this recreational boating was concentrated from the City of Erie to the Ohio State line. The reason for this concentration, west of the proposed project in Harborcreek Township, is that adequate and safe boating access east of the East Avenue launch ramp, in the City of Erie, is severely limited. The study that references these facts is "Feasibility of Boating Access Development on Lake Erie Northwest Township", Erie County, Pennsylvania Fish Commission, Bureau of Fisheries and Engineering, Harrisburg, PA, December 1983.

The proposed construction of a breakwater at Shades Beach Park in Harborcreek Township, Erie County, PA would serve boating needs west of the City of Erie. The project site is a 40 acre Township Park located approximately seven miles from the east boundary of the City of Erie. The limited facilities present at Harborcreek comprise the only existing public boat launch between the Lakeside Park marina (about 7 miles west) and North East, PA (about 8 miles east).

Lake Erie waters, off the Pennsylvania shore, are very productive and a very popular sport fishing area. Excellent sport fishing for Walleye, Pike and for Coho and Steelhead Salmon exists in the general vicinity of Shades Beach. Good near shore fishing for Pan Fish and Bass, in addition to incipient Lake Trout fishing in the area are also important fishing features. Yearling Lake Trout are stocked in Pennsylvania waters each spring.

The area off shore Shades Beach is an excellent fishing area. It provides quality fishing for Pan Fish and Bass in shore, it provides superior deep water fishing for Coho Salmon in the months of August and September when the Salmon seek the deep, cool waters of the Lake. Five miles off Shades Beach there is a large depression in Lake Erie with a depth of approximately 125 feet. This area is termed "the mountain". Commencing August

each year, Coho Salmon congregate in this area and it becomes an extremely popular spot for fishermen to troll. Coho fishing extends through September when the fish migrate closer to shore.

WITHOUT PLAN CONDITION:

The present launch ramp, located on the east side of the beach, is primitive and a very limited launch facility. Since this launch facility does exist, recreation points do exist under the "Without Plan Condition".

WITH PLAN CONDITION:

The proposed plan to improve navigation includes a 180 foot wide launch ramp with five floating docks, each dock shared by two launch lanes. Using a design standard of 15' to launch/retrieve one boat, the entire ramp has an instantaneous capacity to handle ten boats. Additional short term mooring is provided at each floating dock to increase allowable movements at each lane to accommodate trailering activities. It has been justified that a ramp can launch/retrieve 60 boats per day (each boat is both launched and retrieved) equating to 30 total boat movements per lane or 300 total boats accommodated per day.

ALLOCATION OF RECREATION POINTS:

This portion of the report is based upon an analysis made by the Corps of Engineers in their 1985 economic assessment. Fiscal 1985 values have been updated to Fiscal 1989 factors. A case could be made that the "Without Plan Condition" recreation points are conservatively high. There is no justification, at this time, to revise downward the "Without Plan Condition" points which would result in minor increases for average annual benefits and improve the benefit to cost ratio slightly. The points analysis together with the resulting Benefit/Cost ratio is presented in the format used by the U.S. Army Corps of Engineers for determining eligibility for funding under Section 107.

It is known that the existing ramp is used both for fishing and general recreational boating with boat-fishing being the predominate use. As boats are used for specialized fishing, Salmon and Walleye, and general fishing, recreational points have been assigned to three recreational activities: specialized boat fishing (Salmon and Walleye); general boat fishing (Pan Fish and Bass); and recreational boating. The following table presents the allocation of points under "Without" and "With" condition for each activity under each of the five evaluation criteria, as well as the net increase in points and the associated unit daily value (UDV) given in Fiscal 1985 values.

RECREATIONAL ACTIVITY	PLAN CONDITION		NET CHANGE
	"Without"	"With"	Without-With Plan
Specialized Boat Fishing			
Recreation Experience	2	16	14
Availability of Opportunity	3	3	0
Carrying capacity	2	14	12
Accessibility	10	10	0
Environmental Quality	2	14	12
Total	19	57	38
Associated UDV	$14.16	$17.23	$3.07

RECREATIONAL ACTIVITY	PLAN CONDITION		NET CHANGE
	"Without"	"With"	Without-With Plan
General Boat Fishing			
Recreation Experience	5	10	5
Availability of Opportunity	3	3	0
Carrying capacity	2	14	12
Accessibility	10	10	0
Environmental Quality	2	14	12
Total	22	51	29
Associated UDV	$ 2.68	$ 4.18	$1.50

RECREATIONAL ACTIVITY	PLAN CONDITION		NET CHANGE
	"Without"	"With"	Without-With Plan
Recreational Boating			
Recreation Experience	5	10	5
Availability of Opportunity	3	3	0
Carrying capacity	2	14	12
Accessibility	10	10	0
Environmental Quality	2	14	12
Total	22	51	29
Associated UDV	$ 2.68	$ 4.18	$1.50

FISCAL 1989 POINT VALUES: SPECIALIZED FISHING & GENERAL RECREATION (Dollars)

	POINTS										
Activity	0	10	20	30	40	50	60	70	80	90	100
Specialized Fishing	13.50	13.85	14.20	14.55	14.90	16.25	17.65	19.05	20.40	21.80	23.15
General Recreation	1.95	2.25	2.60	3.00	3.45	4.15	4.45	4.80	5.15	5.45	5.80

The points as allocated on the previous page receive the above assigned dollar values which results in determining the UDV for each specialized activity. Interpolation from the above table is used with point totals to find the associated UDV. The demand usage multiplied by the associated UDV results in the net benefit. Dividing the net benefit by the associated costs results in the Benefit/Cost (B/C) ratio.

Specialized Recreation (Fishing) Points:

Nineteen points have been awarded to the project site under "Without Plan Condition" for specialized recreation (fishing). Accessibility has been awarded ten points since there is reasonably good highway access. Environmental quality was assigned two points because of the rustic condition of the present site and, primarily, because the existing launch facilities are unprotected from wave action which limits their use. Carrying capacity was assigned two points since the existing facility has extremely limited capacity. Three points were awarded for availability of opportunity as there are several ramps within one hour and two within 30 minutes travel time. Finally, two points were awarded for recreation experience primarily due to frequent interference at heavy use periods.

Under the "Without Plan Condition", 54 points were awarded to the project site. Recreation experience, carrying capacity and environmental quality received significantly more points under the "With Plan Condition". Availability of opportunity and accessibility points remain unchanged. Recreation experience was awarded 16 points since the proposed facility would have extensive use with only limited interference due to crowding. Carrying capacity was awarded 14 points because the proposed ramp will be large and provide near optimum facilities. Environmental quality was awarded 14 points as the project site should have high aesthetic quality.

The resulting change in specialized recreation boat fishing points from "Without Plan Condition" (19) to "With Plan Condition" (57) amounts to 38. This produces an increase in the associated UDV from $14.16 to $17.23. The resulting increase in the UDV for this activity is $3.07.

General Recreation (Boat Fishing) Points:

The site was awarded 22 points for existing condition general recreation (fishing) use. Due to the variety of general activities available at Shades Beach Park, five points were awarded for recreation experience. Three points were awarded for available opportunity due to other ramps in the general vicinity. Two points were awarded for carrying capacity while ten points were awarded for accessibility. Two points were awarded for environmental quality for the same reasons as are listed under Specialized Recreation Points.

Fifty-one points were awarded to the site under the "With Plan Condition". Ten points were awarded for recreation experience as several general activities are available at the Park site while the availability of opportunity remains unchanged with three points. Carrying capacity was awarded 14 points since the

proposed ramp will be large and can accommodate ten boats simultaneously with a design standard of 15 feet per boat launched/retrieved. The ten points awarded for accessibility remains unchanged while the environmental quality was awarded 14 points because the project site will have high aesthetic quality with no factors that lower its quality.

The resulting change in General Recreation Points (Fishing) from "Without Plan Condition" (22) to "With Plan Condition" (51) amounts to 29 points. This produces an increase in the associated UDV from $2.68 under "Without Plan Condition" to $4.18 under "With Plan Conditions", an increase in the UDV of $1.50.

General Recreational Boating:

The allocation of recreational points to recreational boating under "Without Plan Condition" and "With Plan Condition" is the same as the allocation to General Boat Fishing discussed above. Twenty-two points were allocated under "Without Plan Condition" and 51 points under "With Plan Condition" for a net increase of 29 general recreation points. The associated UDV is $2.68 under "Without Plan Condition" and $4.18 under "With Plan Condition" for an increase of $1.50.

DEMAND FROM SUPPLY AREAS:

Demand for boat launchings at Shades Beach Park boat launch was developed by the Corps of Engineers by estimating a demand from a primary supply area (the nearby Townships of Harborcreek and Lawrence Park and part of the Township of North East) and a secondary supply area (the rest of Erie County, PA). To allow for long distance users who travel from more remote supply areas (Pittsburgh and elsewhere) an additional 5,000 boat days have been added for the specialized fishing available at the project site.

The basis for the demand estimates is an Ohio SCORP peak boat participation rate of 3.0 peak boat days per household; adjusted for 2.5 persons per household, producing a resulting peak boat day participation rate of 1.2 peak boat days per capita. The per capita rate is assumed to include 0.6 for recreational boating, 0.3 for general boat fishing and 0.3 for specialized boat fishing, as applied to the project area. A utilization factor was used to accommodate variation in demand with increasing distance from the project site and variation for peak/nonpeak days. The estimated demand is the product of the supply area's population (1980) multiplied by the appropriate participation rate for the specific boating activity and the utilization factor for that supply area, all divided by 2.5 persons per boat. The following tables present calculations of estimated demand for each boating activity and summarizes the resulting demand figures by supply area for peak and nonpeak days.

Calculation of Demand for Recreational Boating Days for the Harborcreek 107 Project by Type of Recreational Boating Activity

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$$\text{Demand} = \frac{\text{(Population (Participation Rate/Capita) (Utilization Factor)}}{\text{(People/Boat)}}$$

RECREATIONAL BOATING

Primary Supply Area			
Peak Days	= (22,103) (.6) (.9) / (2.5)	=	4,774
Nonpeak Days	= (.3) (Peak Days)	=	1,432
Total Days		=	6,206
Secondary Supply Area			
Peak Days	= (257,677) (.6) (.1) / (2.5)	=	6,184
Nonpeak Days	= (.3) (Peak Days)	=	1,855
Total Days		=	8,039
Both Supply Areas			
Peak Days		=	10,958
Nonpeak Days		=	3,287
Total Days		=	14,245

RECREATIONAL BOAT FISHING: General Fishing

Primary Supply Area			
Peak Days	= (22,103) (.3) (.9) / (2.5)	=	2,387
Nonpeak Days	= (.3) (Peak Days)	=	716
Total Days		=	3,103
Secondary Supply Area			
Peak Days	= (257,677) (.3) (.1) / (2.5)	=	3,092
Nonpeak Days	= (.3) (Peak Days)	=	928
Total Days		=	4,020
Both Supply Areas			
Peak Days		=	5,479
Nonpeak Days		=	1,644
Total Days		=	7,123

Calculation of Demand for Recreational Boating Days for the Harborcreek 107 Project by Type of Recreational Boating Activity

$$\text{Demand} = \frac{(\text{Population})\ (\text{Participation Rate/Capita})\ (\text{Utilization Factor})}{(\text{People/Boat})}$$

RECREATIONAL BOAT FISHING: Specialized Fishing

Primary Supply Area			
Peak Days	$= \frac{(22{,}103)\ (.3)\ (.9)}{(2.5)}$	=	2,387
Nonpeak Days	= (.3) (Peak Days)	=	716
Total Days		=	3,103
Secondary Supply Area			
Peak Days	$= \frac{(257{,}677)\ (.3)\ (.1)}{(2.5)}$	=	3,092
Nonpeak Days	= (.3) (Peak Days)	=	928
Total Days		=	4,020
Both Supply Areas			
Peak Days		=	5,479
Nonpeak Days		=	1,644
Total Days		=	7,123

Total Recreational Boating Demand By Boating Activity: Harborcreek, PA 107

Supply Area			
Primary Supply Area			
Recreational Boating	4,774	1,432	6,206
General Boat Fishing	2,387	716	3,103
Specialized Boat Fishing	2,387	716	3,103
Total	9,548	2,864	12,412
Secondary Supply Area			
Recreational Boating	6,184	1,855	8,039
General Boat Fishing	3,092	928	4,020
Specialized Boat Fishing	3,092	928	4,020
Total	12,368	3,711	16,079
Supplemental Supply Area (1)			
Specialized Boat Fishing			
Total Demand			
Recreational Boat Fishing	10,958	3,287	14,245
General Boat Fishing	5,479	1,644	7,123
Specialized Boat Fishing	5,479	1,644	12,123
Total	21,916	6,575	38,491(2)

NOTE: (1) 5,000 estimated boat days from remote supply areas (beyond Erie County, PA)
(2) Includes the above 5,000 boat days from remote supply areas

DEMAND AT THE PROJECT SITE:

The projected demand from all supply areas was compared to the estimated seasonal use in boat launch days at the proposed improved Shades Beach boat launch site. The boating and boat fishing season extends from mid-April to mid-November, a period of 31 weeks containing 65 peak and 152 nonpeak days. Using a daily capacity of the proposed ramp being able to launch and retrieve 300 boats per day, with a utilization rate of 0.9 for peak days and 0.3 for nonpeak days, the estimated use under the "With Project Condition" amounts to 31,230 boating days including 17,550 peak days and 13,680 nonpeak days. Demand from all supply areas was estimated to be 38,491 boat days. Based upon the foregoing, it may be concluded that the proposed plan will generate the estimated 31,230 boating days. The 31,230 figure was used to calculate the average annual benefits for the project.

BENEFITS:

Project benefits were calculated by multiplying projected use at the project site (17,550 peak boat days and 13,680 nonpeak boat days) by the weighted change in the capital UDV. The weighted change was calculated using the change in UDV for each boating activity (specialized boat fishing, general boat fishing, recreational boating) presented under the ALLOCATION OF RECREATIONAL POINTS portion of this report. The following weights were used: Specialized Boat Fishing = 0.4; General Boat Fishing = 0.2; and Recreational Boating = 0.4. The resulted weighted change in the UDV is $2.13. Multiplying this value by peak and nonpeak boat days produces the benefits of each. The average annual total benefits contributable to the project amounts to $66,520 as tabulated below.

Average Annual Recreational Benefits Associated With Construction of a Breakwater at Shades Beach Park, Harborcreek Township, PA (Spring 1989 Price Level)

ITEM	WEIGHTED CHANGE IN UDV ($)	PROJECTED BOAT DAYS	AVERAGE ANNUAL BENEFITS ($)
Peak Days	2.13	17,550	37,382
Nonpeak Days	2.13	13,680	29,138
Total Days			66,520

ECONOMIC EFFICIENCY:

The plan proposed for navigational improvement incorporating a rubble mound breakwater has a first cost of $1,021,298. Average annual costs amount to $56,642. The plan has net benefits of $66,530 and a B/C of ratio of 1.17 and is economically justified.

ITEMIZED COST ESTIMATE

ITEM	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Project Costs				
(Navigation Improvements)				
Excavation	240	C.Y.	10.10	2,424
Armor and Toe Stone	10,900	Ton	49.30	537,370
Filter Fabric	392	S.Y.	5.30	2,094
Navigation Light Fnd.		L.S.	7,000.00	7,000
SUBTOTAL				$ 548,888
Contingencies (15%)				82,333
Permits, Engineering, Administration & Inspection				45,000
TOTAL				$ 676,221
(Beach Restoration)				
Excavation	778	C.Y.	8.20	6,380
Sand Replenishment	1,640	Ton	7.75	12,710
SUBTOTAL				$ 19,090
Contingencies (15%)				2,864
Permits, Engineering, Administration & Inspection				4,000
TOTAL				$ 25,954
(Boat Launch Ramp)				
Fill	5,286	C.Y.	8.00	42,288
Flatwork Concrete	650	C.Y.	240.00	156,000
Concrete Bulkheads	157	C.Y.	200.00	31,400
Floating Docks	1,650	S.F.	40.00	66,000
SUBTOTAL				$ 295,688
Contingencies (15%)				44,353
Permits, Engineering, Administration & Inspection				15,000
TOTAL				$ 355,041

ITEMIZED COST ESTIMATE

ITEM	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
TOTAL OF PROJECT COSTS				$1,057,216
ASSOCIATED COSTS (Access Road Improvements)				
Earthwork	30,000	C.Y.	2.50	75,000
Drainage	L.S.	L.S.	17,500.00	17,500
Base	18,333	S.Y.	4.80	90,302
Surface Treatment	18,813	S.Y.	1.50	28,220
SUBTOTAL				$ 211,022
15% Contingencies				31,653
Permits, Engineering, Administration & Inspection				36,401
TOTAL				$ 279,076
(Parking Lot and Buildings)				
Earthwork	30,000	C.Y.	2.50	75,000
Drainage	L.S.	L.S.	17,500.00	17,500
Base	22,333	S.Y.	4.80	107,198
Fee Collection Booth	L.S.	L.S.	4,000.00	4,000
Bathhouse & Sanitary Facilities	L.S.	L.S.	30,000.00	30,000
SUBTOTAL				$ 233,698
Contingencies (15%)				35,055
Permits, Engineering, Administration & Inspection				40,313
TOTAL				$ 309,066
TOTAL OF ASSOCIATED COSTS				$ 588,142
TOTAL PROJECT AND ASSOCIATED COSTS				$1,645,358

ALLOCATION OF ASSOCIATED COSTS:

BEACH VISIT DAYS: 17,280/YEAR

Persons/Car: 2.5
Vehicular Movements: 6,912/year

BOAT DAYS: 31,230/YEAR

Persons/Boat-Vehicles: 2.5
Vehicular Movements: 12,492/Year

ACCESS ROAD:

Beach Restoration: (6,912/6,912+12,492) = 35.62%
Navigation Improvements: 64.38%

35.62% x $279,076 = 99,407 (Beach)
64.38% x $279,076 = 179,669 (Boat Launch)

PARKING FACILITIES:

Tow vehicle and trailer require twice the parking area compared to beach use vehicles.

Beach Restoration: (6,912/6,912+12,492+12,492) = 21.67%
Navigation Improvements: 78.33%

21.67% x 40,047 = 8,678 (Beach)
78.33% x 40,047 = 31,369 (Boat Launch)

SUMMARY:

Beach Restoration: 99,407 + 8,678 = 108,085
Navigational Improvements: 179,699 + 31,369 = 211,038

APPROPRIATION OF PROJECT COSTS

NAVIGATION IMPROVEMENTS:

Detached breakwater and "L" shaped breakwater from shore to bend are considered essential to beach protection. Thus, these costs have been prorated to beach restoration.

Breakwaters, excavation and filter fabric:

Beach	123,433 c.f. or 53.51%
Navigation	107,255 c.f. or 46.49%

Navigation Light Foundation: 100% navigation improvements

(7000 x 1.15) + (7000 x 1.15/548,888+82,833)(45,000) = 8,623

Pro-Rated Costs:

676,221 - 8,623 = 667,598

Beach Total: 53.51% x 667,598 = 357,232

Navigation: 46.49% x 667,598 = 310,366
8,623

Total Navigation Improvements: 318,989

COST SHARING SECTION 107 FUNDING ONLY

Detached Breakwater: 29,024 c.f.
All Breakwaters: 230,688 c.f.

BREAKWATER COST FOR NAVIGATION IMPROVEMENTS:

(201,664/230,688) 537,370 =	$ 469,761
EXCAVATION	2,424
FILTER FABRIC	2,094
NAVIGATION LIGHT FOUNDATION	7,000
SUBTOTAL	$ 481,279
CONTINGENCIES (15%)	72,192
PERMITS, ENGINEERING, ADMINISTRATION & INSPECTION	39,457
TOTAL	$ 592,928

FEDERAL SHARE: 50% x 592,928 = 296,484

LOCAL SHARE: 1,021,298 - 296,464 = 724,834

ANNUAL OPERATION & MAINTENANCE COSTS:

NAVIGATION IMPROVEMENTS

LAUNCH RAMP ATTENDANT	
1000 hours/year @ $4.50/hr.	$ 4,500
LITTORAL DRIFT REMOVAL @ HARBOR	
50 C.Y. @ $10.00/C.Y.	500
ROAD, PARKING & LAUNCH MAINTENANCE (L.S.)	2,000
ADMINISTRATION	1,000
SUBTOTAL	$ 8,000

BEACH RESTORATION

BEACH SAND NOURISHMENT	
70 C.Y. @ $7.75/C.Y.	$ 543
LITTORAL DRIFT REMOVAL	
1000 C.Y. @ $10.00/C.Y.	10,000
ROAD, PARKING & BEACH MAINTENANCE (L.S.)	1,000
ADMINISTRATION	457
SUBTOTAL	$ 12,000

TOTAL - OPERATION & MAINTENANCE: $ 20,000

APPROPRIATION OF PROJECT COSTS

ITEM	TOTAL	NAV.IMPR.	BEACH RESTOR.	ASSOCIATED	RECOVERED (by user's fee)
BREAKWATERS	677,598	310,366	367,232		
LIGHTING FND	8,623	8,623			
BOAT RAMP	355,041				355,041
BEACHFILL	25,954		25,954		
PARKING & BLDGS	309,066			40,047	269,019
ACCESS ROAD	279,076			279,076	
TOTAL	1,645,358	318,989	393,186	319,123	624,060

PROJECT BENEFITS & RATIOS (Does not include costs recovered by fees)

ITEM	TOTAL	NAVIGATION IMPROVEMENTS	REACH RESTORATION
PROJECT FIRST COSTS	1,021,298		
DIRECT COSTS		318,989	383,186
ASSOCIATED COSTS		211,038	108,085
PROJECT APPLIED COSTS		530,027	491,271
(1) ANNUAL FIRST COST (0.08646)		45,826	42,475
(2) INTEREST DURING CONSTR. (0.005313)		2,816	2,610
OPERATION & MAINTENANCE		8,000	12,000
AVERAGE ANNUAL COSTS		$ 56,642	$ 57,085
AVERAGE ANNUAL BENEFITS		$ 66,520	$ 73,785
NET BENEFITS		$ 9,878	$ 16,700
BENEFIT/COST RATIO		1.17	1.29

(1) Based on 8.5% interest rate and a 50 year project life.
(2) I.D.C. based on a 3 month construction period with two equal payments: one at the mid-point and one at the end of construction.

BEACH REPLENISHMENT ANALYSIS (SECTION 103)

The proposed beach restoration project at Shades Beach in Harborcreek Township, on Lake Erie, Erie County, PA is located on a project site of 40 acres. This Township Park is located approximately seven miles from the eastern boundary of the City of Erie. It is the only public beach between Presque Isle State Park, twelve miles to the west, and Freeport Beach, eight miles to the east. Shades Beach Park is a well developed facility with sport fields, a playground, two pavilions with kitchen facilities for group picnics, as well as individual picnic facilities.

WITHOUT PLAN CONDITION

The existing beach is small and of very poor quality at present. The beach is the remnant of what was once a large, attractive and very popular beach. It has been eroded and most of the sand fill has been removed. The beach is largely covered with loose pieces of shale approximately softball size. The beach is small and unattractive in its present condition and has been closed to swimming by Harborcreek Township. It will remain closed to swimming until a reconstructed beach is established. Given its present condition, and the fact that it is closed to swimming, the Army Corps of Engineers allocated zero recreational points to the project site under the "Without Plan Condition".

WITH PLAN CONDITION:

The proposed plan calls for reconstruction of the beach to an approximate dimension of 40 feet long by an average of 48 feet wide between the edge of water and bluff. This will produce a beach with a surface area of 19,200 square feet. Beach fill should be clean, medium size sand. A limited amount of annual nourishment, approximately 70 cubic yards is anticipated.

Under the "With Plan Condition", the Army Corps of Engineers have allocated general recreation points to the project site for recreational beach use. Ten points were allocated for recreational experience criteria as there are several general activities such as swimming, picnicking, hiking, playgrounds, etc. Eight points were allocated for availability of opportunity as there are two competing beaches within a one hour drive of the site. Twelve points were allocated under carrying capacity as the beach will be quite large and well integrated into a developed and well maintained Township park. Ten points were allocated for accessibility, fourteen points were awarded for environmental quality due to its picturesque and attractive setting with no environmental liabilities. The above allocation produces a total of 54 general recreational points which converts to a UDV of $4.27. Since there was zero recreational points under the "Without Project Condition", the full $4.27 accrues as a benefit to each user visit to the reconstructed beach.

General Recreation Points for Restoration of a Beach at Shades Beach Park, Harborcreek Township, PA

Recreational Beach Activities	General Recreation Points Without Plan	With Plan	Net Increase
Recreation Experience	0	10	10
Availability of Opportunity	0	8	8
Carrying Capacity	0	12	12
Accessibility	0	10	10
Environmental Quality	0	14	14
Total	0	54	54
Associated UDV	0	$4.27	$4.27

General Recreation Points and Unit Day Values (UDV) (FY 89)

POINTS	0	10	20	30	40	50	60	70	80	90	100
UDV	1.95	2.25	2.60	3.00	3.45	4.15	4.45	4.80	5.15	5.45	5.80

EVALUATION OF BENEFITS:

The recreation beach benefits at Shades Beach Park were evaluated in two steps. Potential demand for visitors to the Park was estimated and this demand was compared to the capacity of the beach under the plan condition. Also, after having verified that there is adequate demand to absorb the capacity at the proposed reconstructed beach, average annual recreational beach benefits were calculated.

Supply and Demand:

Swimming demand estimates at Shades Beach Park require determination of a probable supply area which reasonably could be expected to supply visitors to the reconstructed beach. The Corps

of Engineers determined that the primary supply area for the proposed project consisted of the Townships of Harborcreek and Lawrence Park and one-half of the Township of North East. This was based upon site visits and knowledge of nearby beaches. In general, this consists of a zone within a six mile radius of Shades Beach Park. The population of the primary supply area was 22,103 persons in 1980. A secondary supply area consists of the rest of Erie County, 1980 population of 257,677 persons.

Potential demand for recreational beach use at Shades Beach Park has been estimated using the Ohio SCORP peak participation rate of 18 visits per season per capita. This value, multiplied by the population of each supply area and a utilization factor, which allows for diminished use in the secondary supply area because of increased travel distance from the project site as well as an increased availability of alternative beaches, produces estimated peak potential demand for recreational beach use at Shades Beach Park. Nonpeak potential demand had been estimated to be 30% of peak demand by the Corps. The following table presents potential peak demand data for the project site. Total potential peak demand was estimated to be 82,189 visits per season. Allowing nonpeak demand to equal 30% of peak demand, nonpeak demand is an additional 24,657 visits per year. Total potential demand (Peak plus nonpeak) amounts to 106,846 visits per season.

The peak participation rate is the number of times an individual is expected to swim on a peak day, weekend, or holiday during the swimming season based upon Ohio SCORP data. The utilization factor is allowance for inclement weather, availability of alternative beaches and increased distance from Shades Beach.

POTENTIAL PEAK DEMAND FOR RECREATIONAL BEACH VISITS
AT SHADES BEACH PARK

SUPPLY AREA	POPULATION IN SUPPLY AREA	PEAK PARTICIPATION RATE	UTILIZATION FACTOR	POTENTIAL DEMAND
Primary	22,103	1.8	0.9	35,807
Secondary	257,677	1.8	0.1	46,382
Total				82,189

Capacity at the reconstructed beach is constrained by the size of the beach being only 19,200 square feet. Using a design standard for beach use per capita of 100 square feet per person, coupled with a turnover rate of 2.0 per day, with 30 peak days per season and assumed nonpeak use of 30% of peak demand, the capacity at the reconstructed beach is estimated to be 14,976 visit days. This is 18% of the estimated total potential demand and approximately 42% of potential demand from the primary supply area. It

appears that there is more than adequate demand to absorb the capacity for recreational beach use existent in the proposed plan. The calculation of recreational benefits is a chain multiplication process including the following variables: instantaneous capacity (192 persons); turnover rate (2.0); increase in UDV ($4.27) and the number of peak days per season (30). The resulting value, $49,190 constitutes peak day recreational benefits.

However, the Corps of Engineers' nonpeak use equivalent of 30% of peak day use will most likely be exceeded due to potential demand. We believe it would be appropriate to use 50% as a nonpeak value in this instance due to excessive demand. Assuming nonpeak use equivalent to 50% of peak day use, nonpeak day benefits were estimated to be $24,595 and total recreational beach benefits were estimated to be $73,765.

ECONOMIC EFFICIENCY:

The overall plan to improve Shades Beach Park with adequate access roads, parking facilities, appurtenant structures, beach restoration and breakwater with boat launching ramps are assumed to be eligible for Section 107 (Navigational Improvements) funding and possibly the addition of Section 103 (Beach Improvements) federal funding. It is further assumed that the beach improvements would be constructed simultaneously with the navigational improvements regardless of whether or not Section 103 federal funding assistance was available. Section 107 and Section 103 funding does not impact the calculation of net benefits nor the benefit to cost ratio for the project. However, federal funding significantly impacts the local share costs for the project.

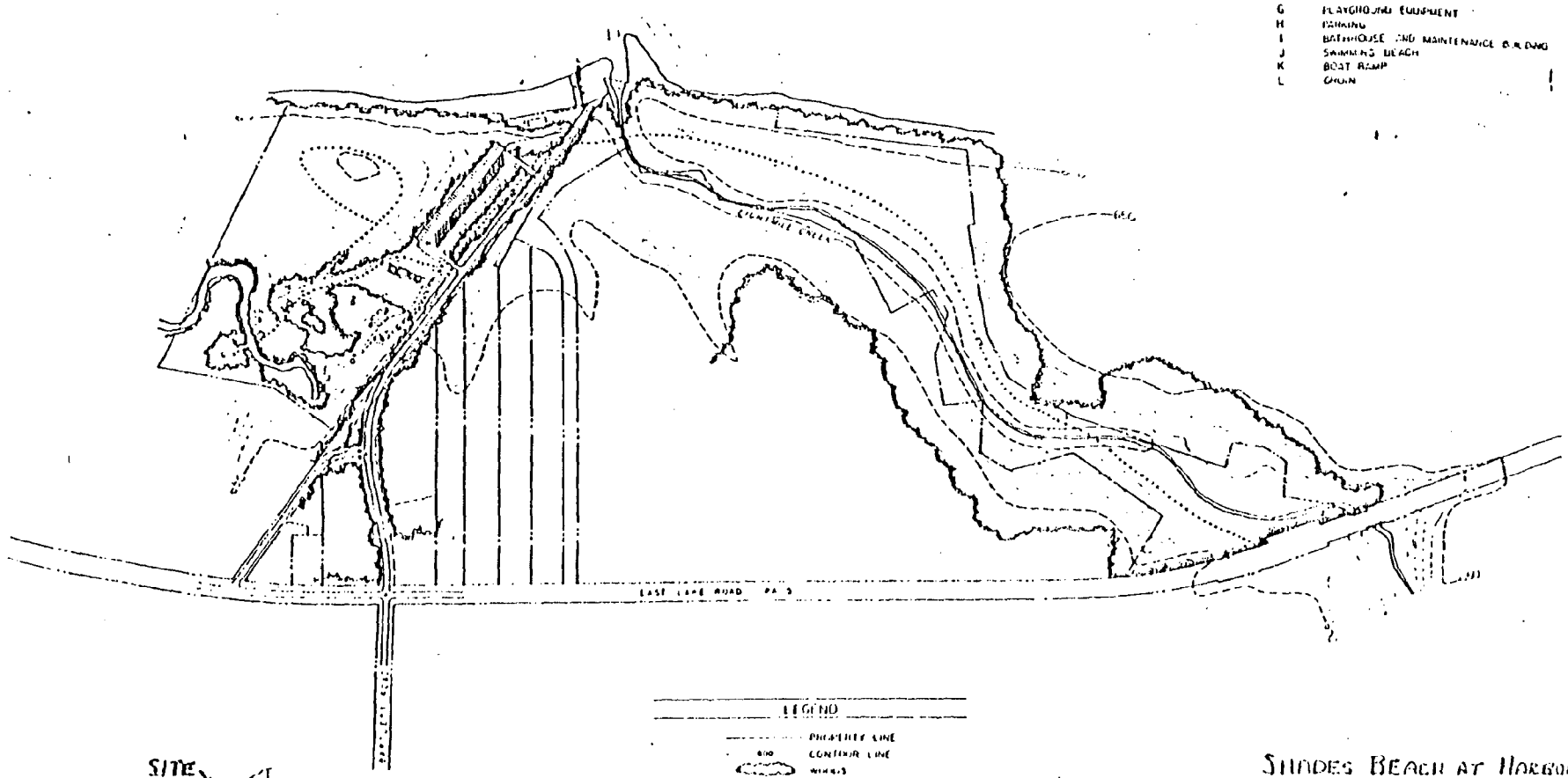
An itemized cost estimate for each aspect of the project has been prepared. The cost estimate may be found in the main body of the report under the Section ECONOMIC ANALYSIS.

AVERAGE ANNUAL COSTS, BENEFITS, NET BENEFITS, & BENEFIT/COST RATIO (SPRING 1989 PRICE LEVELS)

ITEM	TOTAL COST	INCREMENTAL SECTION 107	INCREMENTAL SECTION 103
Project First Costs	$ 1,021,298	$ 530,027	$ 491,271
First Costs (1)		45,826	42,475
IDC (2)		2,816	2,610
O&M		8,000	12,000
Average Annual Costs		56,642	57,085
Average Annual Benefits		66,520	73,785
Net Benefits		9,878	16,700
Benefit/Cost Ratio		1.17	1.29

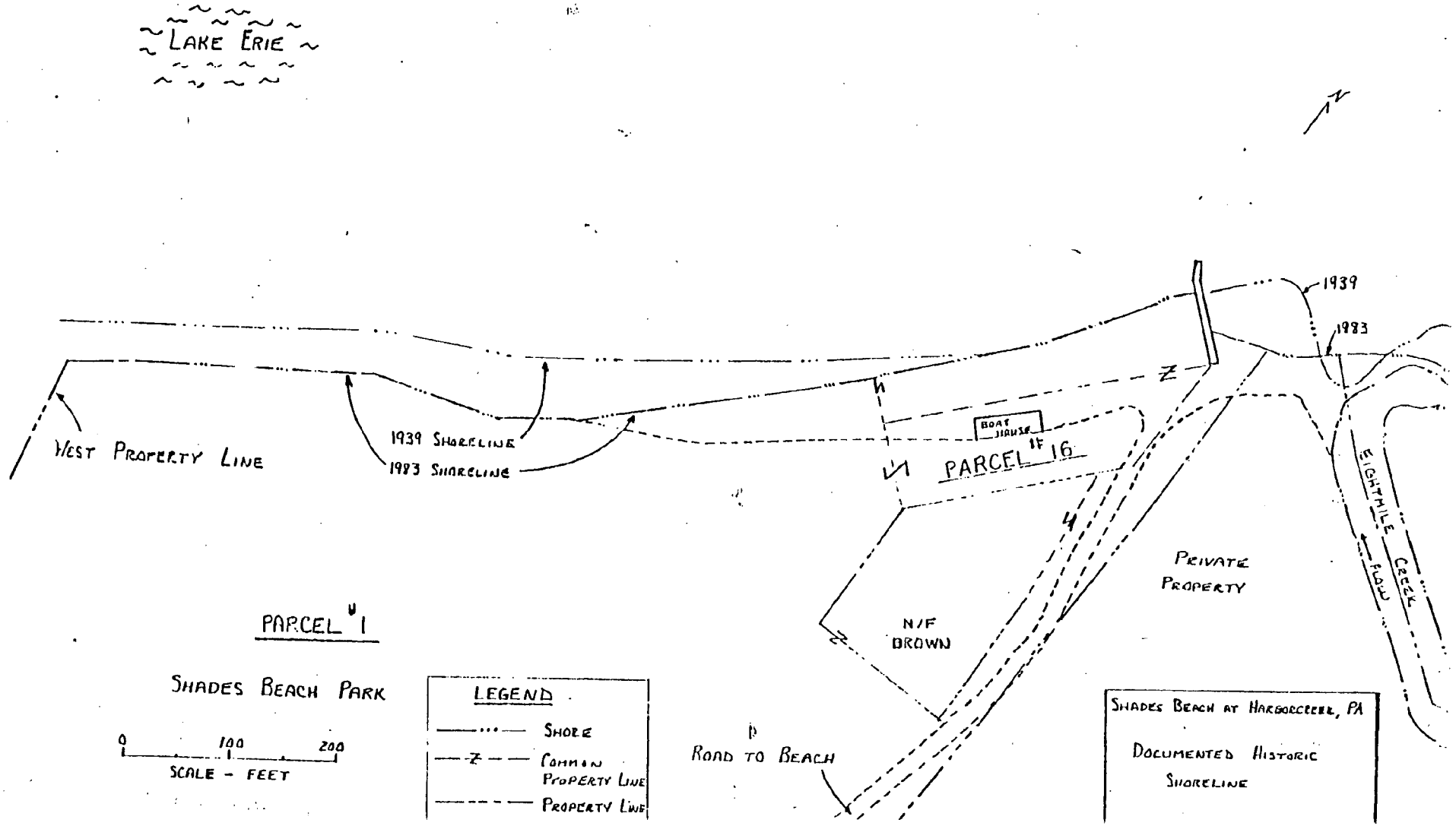
NOTE: (1) Based on an 8 1/2% interest rate and a 50 year project life.
(2) IDC based upon a 3 month construction period with two equal payments, one at mid-point and one at the end of construction.

MAPS AND PHOTOGRAPHS



Shades Beach at Harborcreek
Pennsylvania

Shades Beach Park Map


LAKE ERIE
1939
1983
BOAT HOUSE
WEST PROPERTY LINE
1939 SHORELINE
1983 SHORELINE
PARCEL 16
EIGHTMILE CREEK
FLOW
PRIVATE PROPERTY
N/F BROWN
PARCEL 1
SHADES BEACH PARK
0 100 200
SCALE - FEET
LEGEND
SHORE
COMMON PROPERTY LINE
PROPERTY LINE
ROAD TO BEACH
SHADES BEACH AT HARBORCREEK, PA
DOCUMENTED HISTORIC SHORELINE

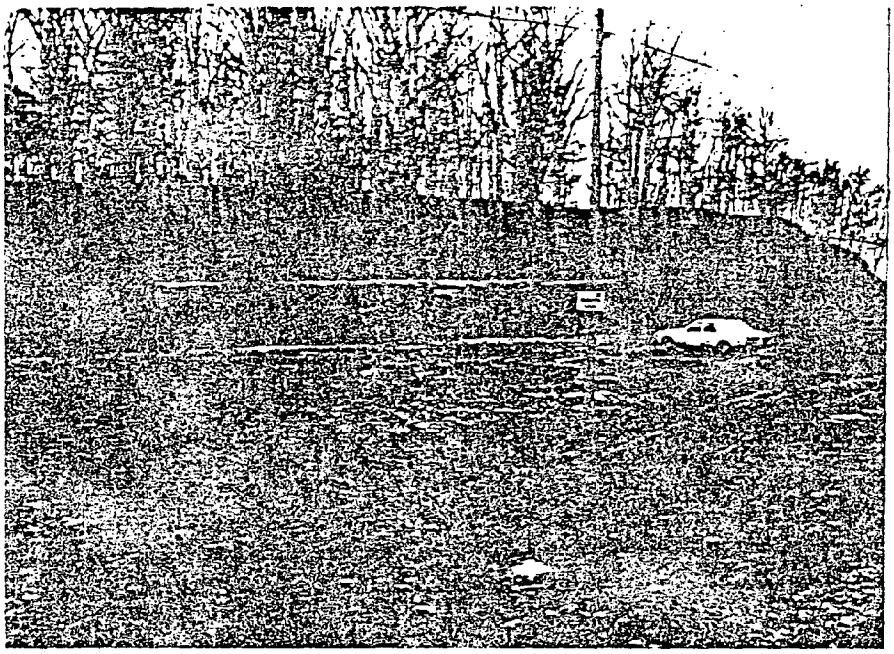


PHOTO 1 : PARKING AREA IN PARK

PHOTO 2 - Road to Beach

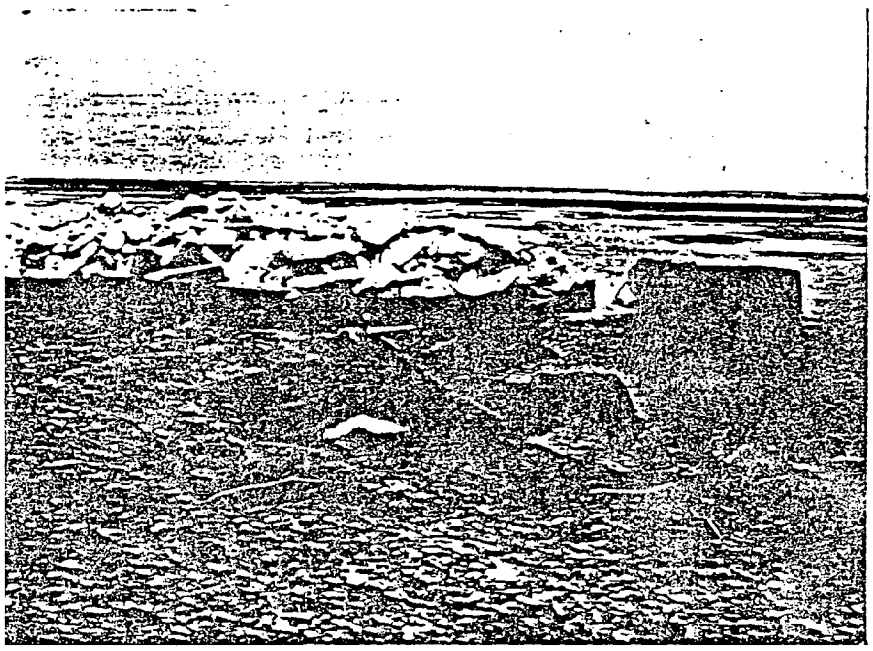


Photo 3 - Grain (Note that last 20' was snapped off during winter. Town intends to repair it.)

Photo 4 - Boat house and Beach

(BOAT HOUSE TO-BE DEMOLISHED)

Aerial Views

Photo 5 -

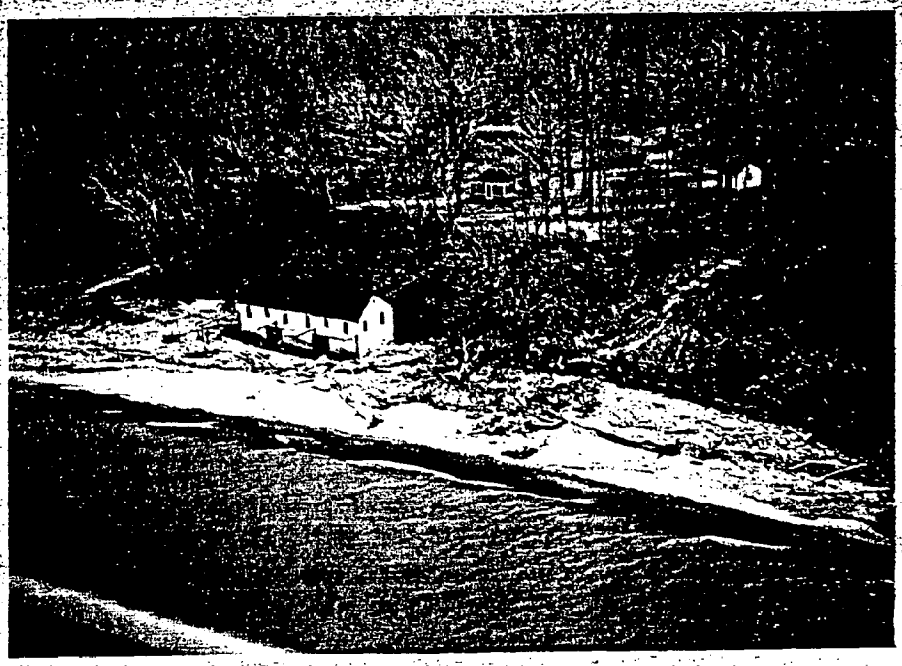
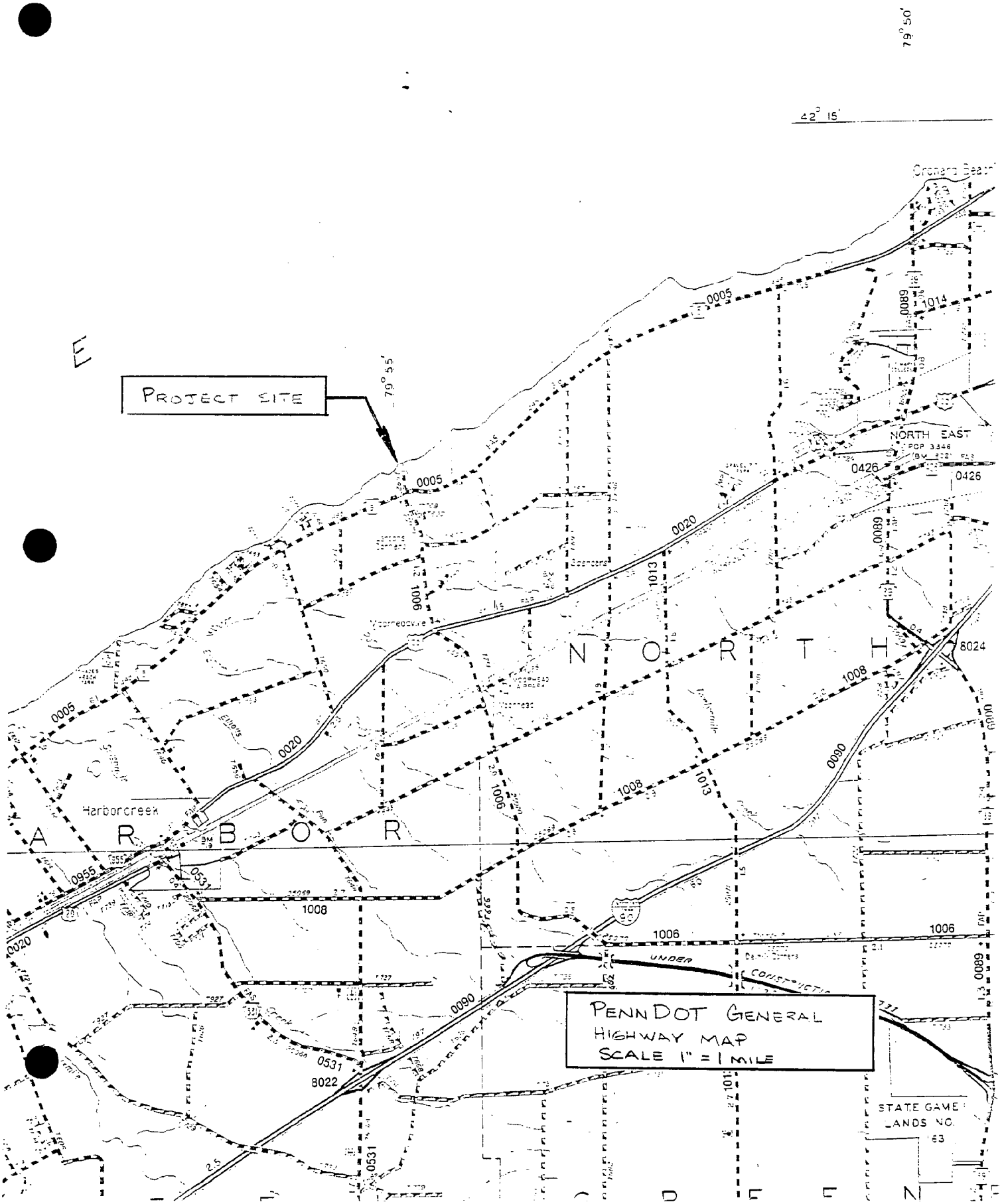


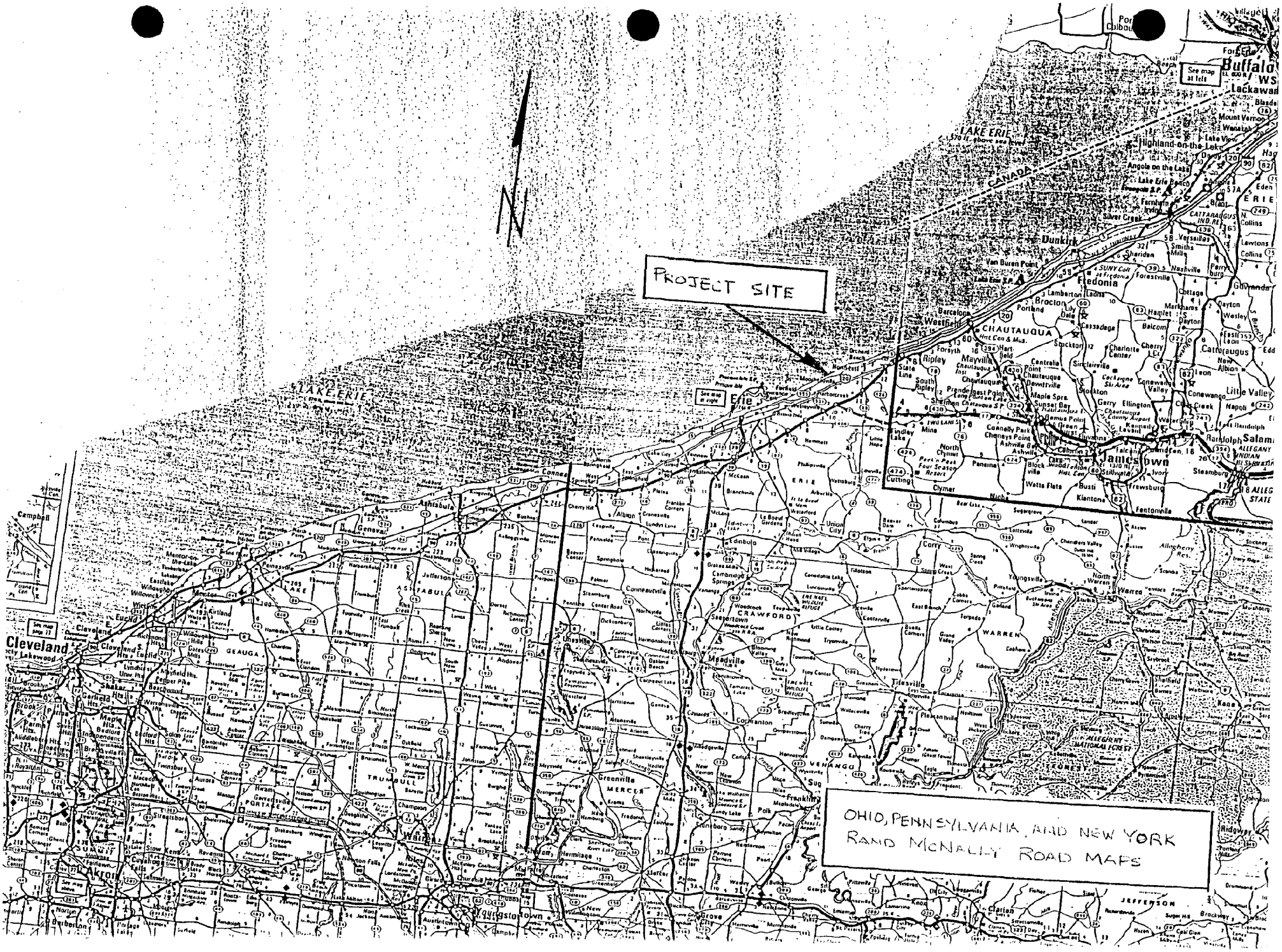
Photo 6 -

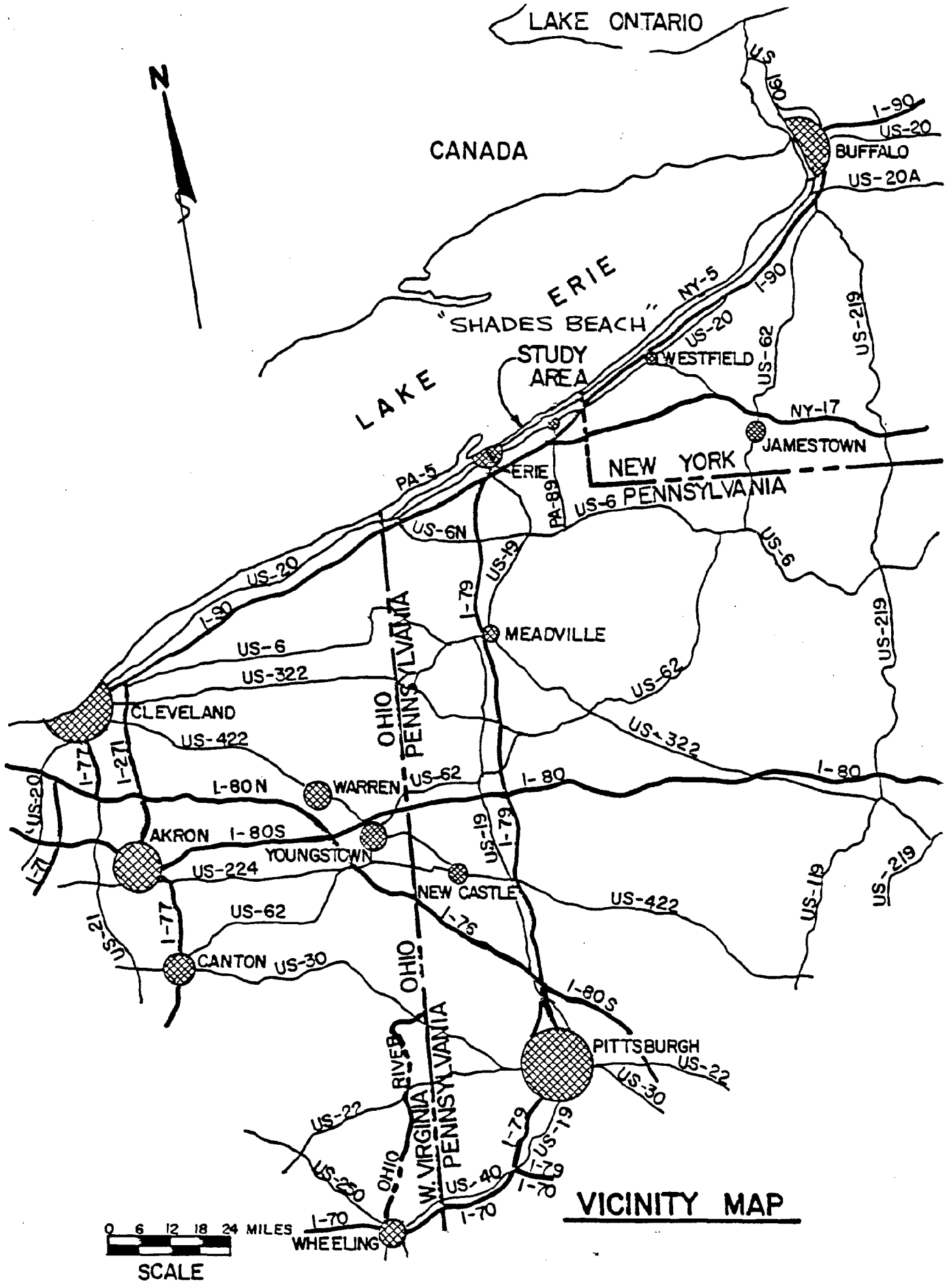
PHOTO 7 - ACCESS ROAD

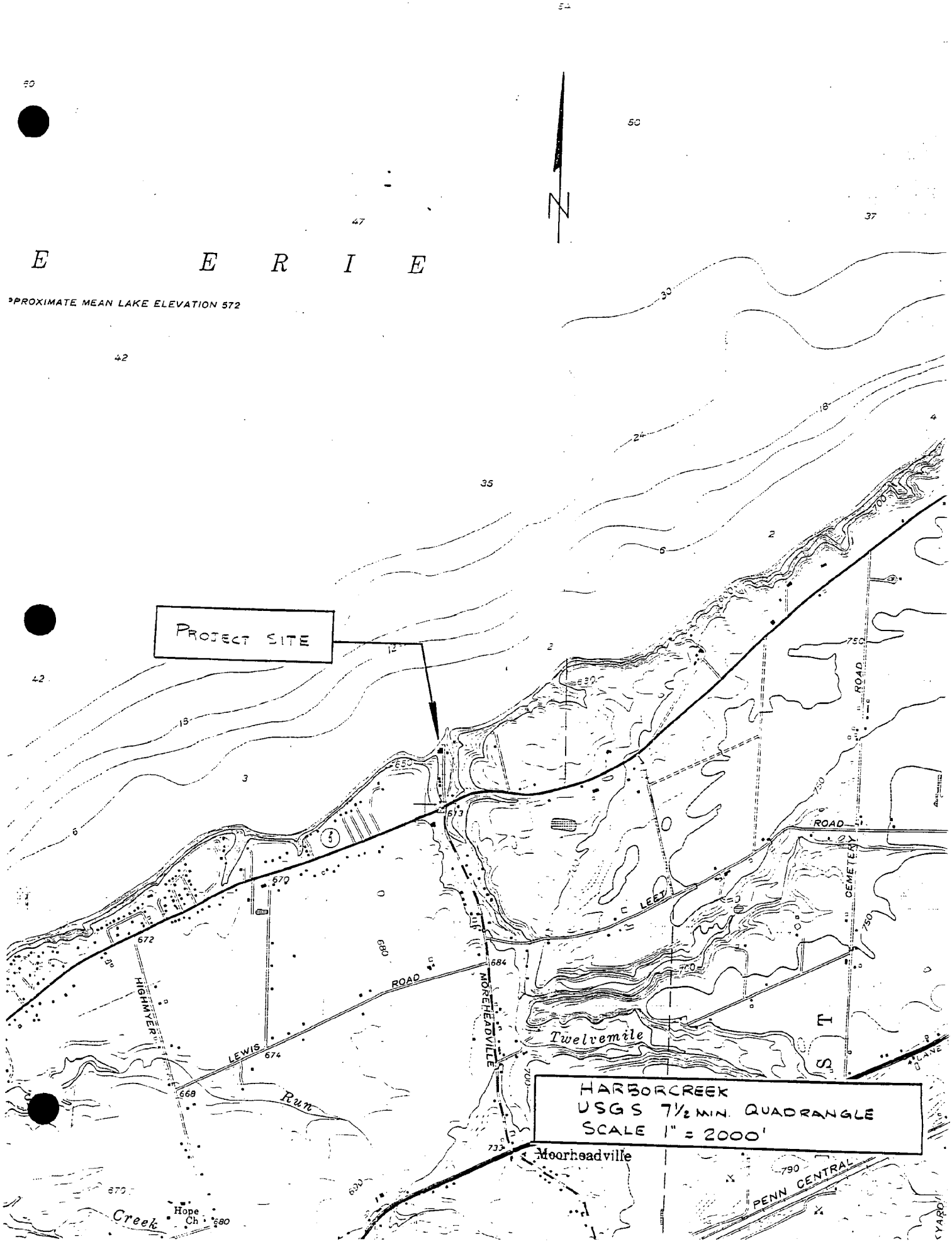
PHOTO 8



PROJECT SITE
PENNDOT GENERAL
HIGHWAY MAP
SCALE 1" = 1 MILE
79° 50'
42° 15'
79° 55'
NORTH EAST
Harborcreek
N O R T H
A R B O R
UNDER
STATE GAME
LANDS NO.
0005
0020
0090
0089
0426
1006
1008
1013
1014
0955
0531
8022
8024


PROJECT SITE
N
LAKE ERIE
CANADA
Buffalo
Dunkirk
Fredonia
Westfield
CHAUTAUQUA
Jamestown
Erie
Cleveland
Akron
Youngstown
Warren
Meadville
Titusville
OHIO, PENNSYLVANIA, AND NEW YORK
RAND McNALLY ROAD MAPS


LAKE ONTARIO
N
CANADA
US-190
I-90
US-20
BUFFALO
US-20A
ERIE
"SHADES BEACH"
NY-5
I-90
US-20
US-62
US-219
LAKE
STUDY AREA
WESTFIELD
NY-17
JAMESTOWN
NEW YORK
PENNSYLVANIA
ERIE
PA-5
PA-89
US-6
US-6N
US-20
I-90
US-19
I-79
MEADVILLE
US-6
US-322
US-62
US-219
OHIO
PENNSYLVANIA
CLEVELAND
US-422
I-77
I-271
I-80N
WARREN
US-62
I-80
US-20
AKRON
I-80S
YOUNGSTOWN
US-224
NEW CASTLE
US-422
US-62
I-77
US-21
CANTON
US-30
I-76
I-80S
OHIO
RIVER
W. VIRGINIA
PENNSYLVANIA
PITTSBURGH
US-22
US-30
US-22
US-250
OHIO
US-40
I-70
I-79
I-70
WHEELING
0 6 12 18 24 MILES
SCALE
VICINITY MAP


E E R I E
APPROXIMATE MEAN LAKE ELEVATION 572
PROJECT SITE
HARBORCREEK
USGS 7½ MIN. QUADRANGLE
SCALE 1" = 2000'
ROAD
CEMETERY
LEWIS
HIGHMYER
MOREHEADVILLE
Twelvemile
Run
Creek
Hope Ch
Moorheadville
PENN CENTRAL

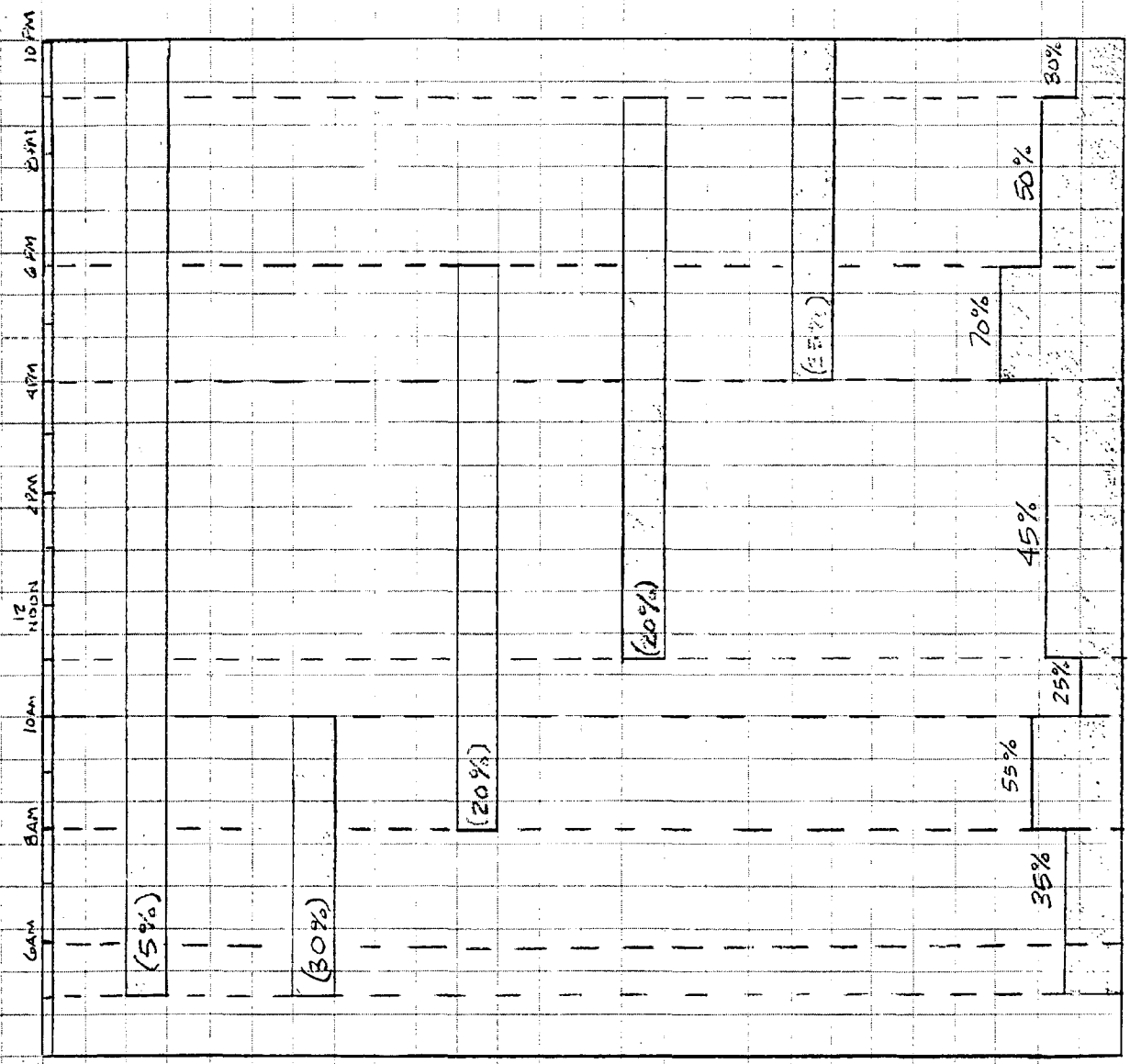
Northwest Engineering Inc.

Consultants and Civil Engineers

PAGE____ OF____

BY: BEC DATE: 4/10/89 SUBJECT: SHADES BEACH; PEAK DAILY BOATING USAGE

(TO DETERMINE PARKING CAPACITIES)



ALL DAY BOATERS
6AM - 10 PM (±1 HR)
5% OF USERS

AM FISHERMEN
6AM - 9AM (±1 HR)
30% OF USERS

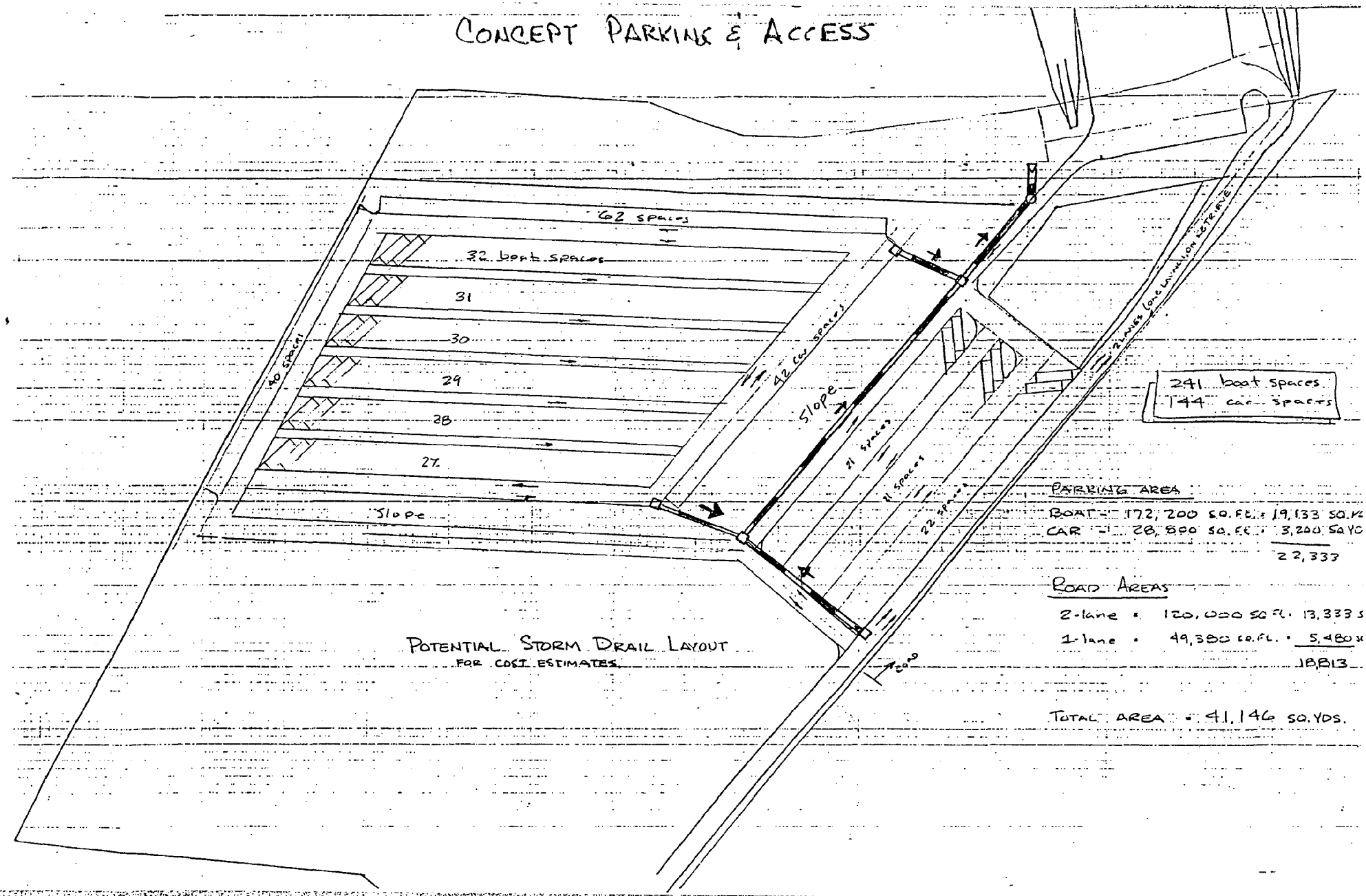
DAY BOATERS
9AM - 5 PM (±1 HR)
20% OF USERS

AFTERNOON - EVENING BOATERS
12 NOON - 8 PM (±1 HR)
20% OF USERS

EVENING BOATERS
6PM - 10 PM (±1 HR)
25% OF USERS

TOTAL USAGE
PEAK = 70%

CONCEPT PARKING & ACCESS



PARKING AREA

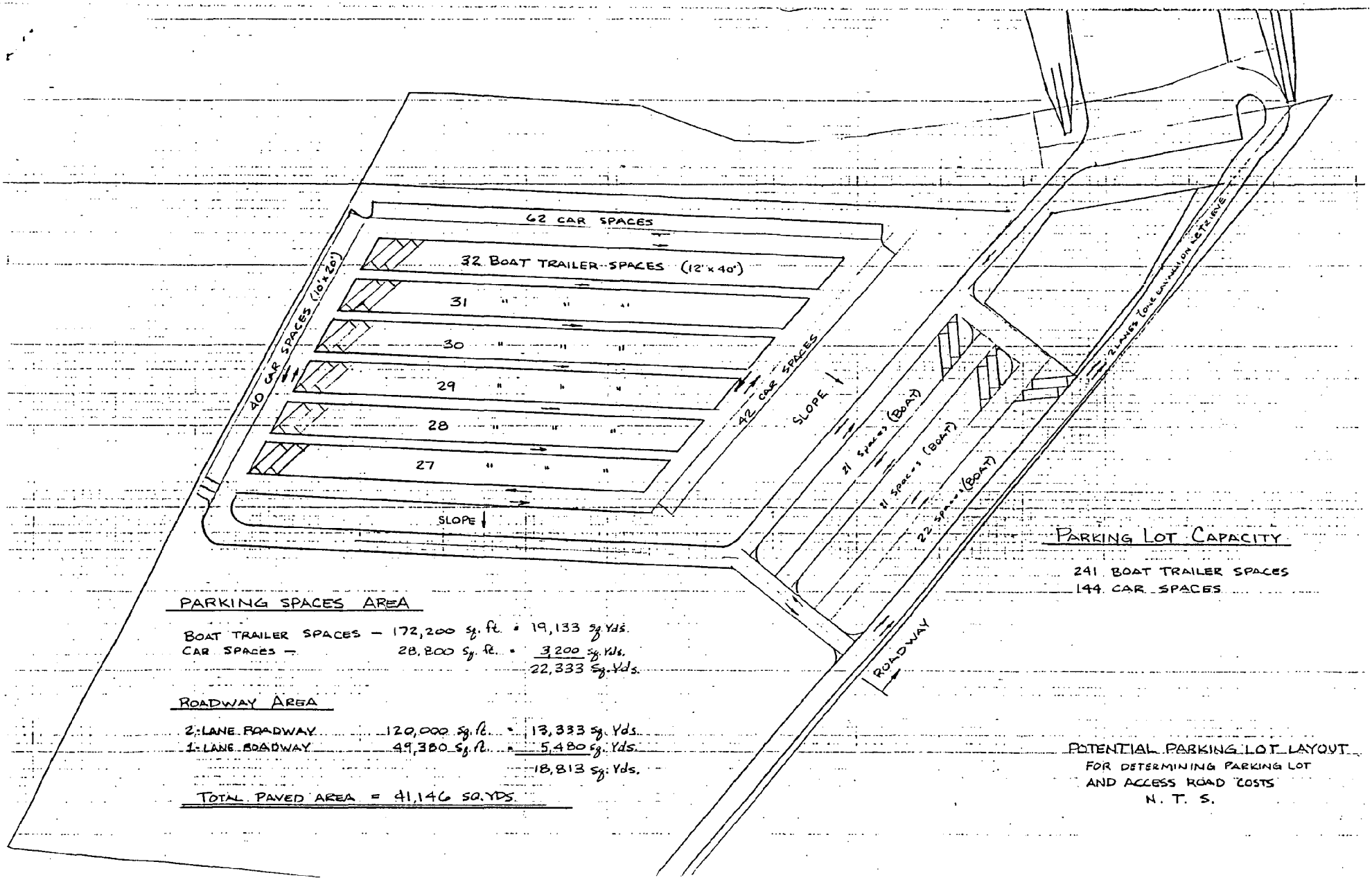
BOAT = 172,200 SQ.FT. = 19,133 SQ.YD
CAR = 28,800 SQ.FT. = 3,200 SQ YD
22,333

ROAD AREAS

2-lane = 120,000 SQ FT. 13,333 S
1-lane = 49,380 SQ.FT. = 5,480 S
18,813

TOTAL AREA = 41,146 SQ.YDS.

Alternate Concept Parking & Access



PARKING SPACES AREA

BOAT TRAILER SPACES — 172,200 sq. ft. = 19,133 sq. Yds.
CAR SPACES — 28,800 sq. ft. = 3,200 sq. Yds.
22,333 sq. Yds.

ROADWAY AREA

2-LANE ROADWAY ..... 120,000 sq. ft. = 13,333 sq. Yds.
1-LANE ROADWAY ..... 49,380 sq. ft. = 5,480 sq. Yds.
18,813 sq. Yds.

TOTAL PAVED AREA = 41,146 SQ. YDS.

PARKING LOT CAPACITY

241 BOAT TRAILER SPACES
144 CAR SPACES

POTENTIAL PARKING LOT LAYOUT
FOR DETERMINING PARKING LOT
AND ACCESS ROAD COSTS
N. T. S.

PARKING LOT REQUIREMENTS

According to the "Initial Appraisal Report" by the Corps of Engineers, the boat launch has a capacity to launch and retrieve 300 boats per day. This is a peak usage and would only be encountered on peak days. Also, it is assumed that there is a peak deployment of boats within the peak day, therefore, only a fraction of the total number of boats that can be launched and retrieved in a day is needed for parking spaces.

Boaters can be separated into several categories according to when they will be using the facility and a percentage of the total amount of users can be estimated for each category on a peak day. Below is a listing of these categories.

Category	Time of Usage	% of Users
All day boaters/fishermen (trips, distant fishing waters)	5 AM - 10 PM	5%
Morning fishermen	5 AM - 9 AM	30%
Day fishermen/Recreational boaters	9 AM - 5 PM	20%
Afternoon/Evening boaters/fishermen	12 Noon - 8 PM	20%
Evening boaters/fishermen	5 PM - 10 PM	25%

Combining the different categories and overlapping the time periods, a maximum of 70% of the ramp capacity can be used for the parking requirements. This amounts to 210 parking spaces needed for the boat launch.

The proposed beach capacity is figured from a total area of 19,200 square feet divided by 100 square feet per person, which comes to an instantaneous capacity of 192 people. No turnover rate is applied due to the fact that when people leave the beach they normally take their car with them. Using an average of two people per car, 96 parking spaces are needed.

PUBLIC MEETINGS

OCTOBER 4, 1988
MARCH 29, 1989

for

RESTORATION OF SHADES BEACH

October 4, 1988
7:30 P.M.

HARBORCREEK TOWNSHIP MUNICIPAL BUILDING

1. Marvin L. Akerly
2. Paul Groney
3. Jim Murphy
4. Joyce Ferringer
5. Richard Feninger
6. Eleanor Musgrave

Public Meeting for design
Restoration of Shade's Beach

October 4, 1988
7:30 P.M.
HARBORCREEK TOWNSHIP
MUNICIPAL BLDG.

1. [illegible]
2. PAUL GRONEY
3. JIM MURPHY
4. Joyce Finnigan
5. Richard Finnigan
6. Eleanor Musgrave
7.
8.
9.
10.
11.
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13.
14.
15.
16.
17.
18.
19.
20.
21.
22.
23.
24.
25.
26.
27.

7:45 opened Vice Chairman Akerly
Shades Beach Restoration
To: Paul Groney, Twp. Engineer

Joyce Ferringer
Dick Ferringer

1) Preliminary Plans
2) Reason here to rec comments.

Consists of 1985 requirements (generally, based upon)
U.S. Corp initial appraisal study

Purpose: feasibility of project navagational improvements, some direction re: type of project costs, etc.

Results: Yes, if there is need for navigational and recreational area.

Boat Ramp - enclosed harbor rec benefits also

After Study - Twp. pursued design phase - twp. rec C2 grant to fund bulk of this phase.

Breakwall over existing wall - with an arm.

Small breakwater and (concrete) slab shall (provide a safe harbor for launching and receiving small craft).

Boat launch 220' wide.

Joyce - one road over hill

Price of particular design

Corp 1985 - 800,000 for improvements to bluff

No boat launch pads in this $ amount

Joyce - Road capable handle traffic
today $1 million

R? Construction $?

Mo CZA are allotting $ for constr.

designed contract to build breakwaters

estimated $1,000,000

off shore drilling leases

couple years to start

6 - 8 yr. to complete

8:40 A.M.

7:45 opened Vice Chr - Akerly
Shades Beach Restoration
TO Paul Groney, Twp Engr.

Joyce Ferrenger
Dick Ferrenger

1) Preliminary Plans
2) Reason here to rec comments.

Consists of 1985
req. US Corp initial
appraisal study

Purpose: feasibility of project
Navigational improvement
Some direction re Type of proj
Costs, etc

Results - yes it there is need
for navigational & rec area

Boat Ramp - enclosed
Harbor rec benefits also

after study - Twp pursued
design phase - Twp rec'd
CZ grant to fund walk of this
phase

Breakwall over existing wall - with an arm

Small breakwater & slabtrade shale

Boat launch 220' wide

Joyce - one road over hill

Price of particular design

Corp 1985
800,000 for improvements
to Bluff

No boat launch pads in this $ amt.

Joyce Road capable handle traffic

Today $1 million

R ? Construction $?

MA CZA are allotting $ for Constr

designed Contract to build break water - $

estimated $1,000,000

off shore drilling leases →

Couple years to start ↓

6-8 yr to complete.

PROOF OF PUBLICATION OF NOTICE

IN

THE ERIE MORNING NEWS

RECEIVED
SEP 29 1988

COMMONWEALTH OF PENNSYLVANIA }
COUNTY OF ERIE } SS:

EDWARD M. MEAD, being duly sworn, deposes and says that he is co-publisher of the Times Publishing Company, which publishes: THE ERIE MORNING NEWS a daily newspaper of general circulation, established January, 1957, and published at Erie, Erie County, Pennsylvania, and that the notice of which the attached is a copy cut from said newspaper, was printed and published in the regular edition of said newspaper of the following dates:

ON THE 26TH DAY OF SEPTEMBER, 1988

Affiant further disposes that he is duly authorized by THE TIMES PUBLISHING CO., publishers of THE ERIE MORNING NEWS to verify the foregoing statement under oath, and affiant is not interested in the subject matter of the aforesaid notice allegations in the foregoing statement as to time, place, and character of publication are true.

Edward M. Mead

SWORN TO AND SUBSCRIBED BEFORE ME THIS

26TH DAY OF SEPTEMBER, 1988

Charlene A. Fumi
NOTARY PUBLIC

NOTARIAL SEAL
CHARLENE A. FUMI, NOTARY PUBLIC
ERIE, ERIE COUNTY
MY COMMISSION EXPIRES NOV. 30, 1991

Member, Pennsylvania Association of Notaries

A Public Meeting will be held on October 4, 1988, at 7:30 P.M. at the Harborcreek Township Municipal Building, 5601 Buffalo Road, Harborcreek, to receive public comments concerning a proposed harbor and beach restoration project at Shade's Beach in Harborcreek Township.

A design study is being performed for proposed improvements at Shade's Beach which will result in a safe harbor and boat ramp.

This study is being funded through a grant from the Coastal Zone Management Division of the Pennsylvania Department of Environmental Resources and Harborcreek Township.

Eleanor H. Musgrave, Secy.
Harborcreek Township
(9-6040 N 26; T-30)

PUBLIC MEETING - 7:30 p.m. - 3/29/89 - ATTENDANCE

E.A. _____, 297 Kraus Dr.
S____ Caldwell, 2006 Cook
C. Ande___, 6916 Clark Road
R. Edwards, 744 Belle Rd.
George Reynolds, 3640 Ridge Parkway
_____, 3564 _____ _____
Sandie T. Hughes, 5016 Buffalo Road

SHADES BEACH RESTORATION

Bill Balzer
Jim Butler
Jim Erickson
Robert H. Whitney
David Skellie - County Planning Dept.
David K. Bossart

_____
Mary Pat Beal - ___ Breeze
Pete Rostatto, 5757 E. Lake Road
Dale Pierce
R. Edwards
Roy Emling
Richard Langer
Harry McQueeney

Rd.

nael

Rd

3/15/89

PUBLIC MEETING
7:30PM
3/29/89
ATTENDANCE

E. A. Chakoyi 297 Kraus Dr.
Sue Caldwell 2006 Cook
C. Andersky 6916 Clark Rd
R. Edwards 744-1 Belle Rd.
George Reynolds 3640 Ridge Parkway
[illegible] 3864 Gay Rd
Nancie J Hughes 5016 Buffalo Rd
Shades Beach Restoration
Bill Balzer
Jim Butler
Jim Erickson
Robert H Whitney
David Skillie County Planning Dept.
David K. Bossert
Edward J Carlisle
Mary Pat Beach - NE Breeze
Peta Rostatter 5757 E. Lake Rd
Dale Pierce
L. Edwards
Roy Emling
Richard Langer
Harry McQueeney

SHADES BEACH RESTORATION PROJECT

Public Meeting #2 - March 29, 1989

Minutes

After discussing the conceptual design of the entire project and then both the permitting and construction phases of the project, much discussion was generated. The following comments were raised as suggestions and concerns regarding the completed beach and safe harbor areas:

1. Concern was expressed for the capability of launching larger boats at the facility. It was suggested that the facility should be capable of handling, at a minimum, a boat of 28 feet in length. A water depth of 7 feet seems inadequate to handle this size of craft.

2. Discussion was raised regarding the design water level and future lake levels. The U.S. Army Corps of Engineers should be contacted regarding this matter.

3. Temporary mooring hook-ups would be desirable inside the harbor to allow boats to safely wait to enter the launch area to remove their boats.

4. It would be desirable to construct an anchoring area east of the breakwater to allow boaters to leave their crafts in the water overnight without having to haul the boat from the water and relaunch it again the following morning.

5. It was stated that adequate lighting throughout the entire park area (i.e. harbor, beach, access roads and parking area) would be essential to allow for a safe and attractive facility.

6. It was suggested by Dave Skellie, Director of the Erie County Department of Planning that the overall project be approached in several phases to facilitate financing for the project. This undoubtedly will have to be pursued.

7. Strong support was given for such a project. In fact, several members of the audience expressed the opinion that such a facility would produce a regular user base that would extend throughout the entire tri-state area, including all of northwestern Pennsylvania.

Erie 3/22/89

(3-1555-N-22)

A Public Meeting will be held on Wednesday, March 29, 1989, at 7:30 P.M. at the Harborcreek Township Municipal Building, 5601 Buffalo Road, Harborcreek, PA to receive public comments concerning a proposed harbor and beach restoration project at Shade's Beach in Harborcreek Township which is currnetly under design.

(3-1591-N-22; T-23)

WANTED

INVENTORY OF FISHING AND BOATING FACILITIES FOR LAKE ERIE ALONG THE PENNSYLVANIA SHORELINE

This section is an excerpt from the "Feasibility of Boating Access Development on Lake Erie, North East Twp., Erie Co." prepared by the PA Fish Commission in December 1983

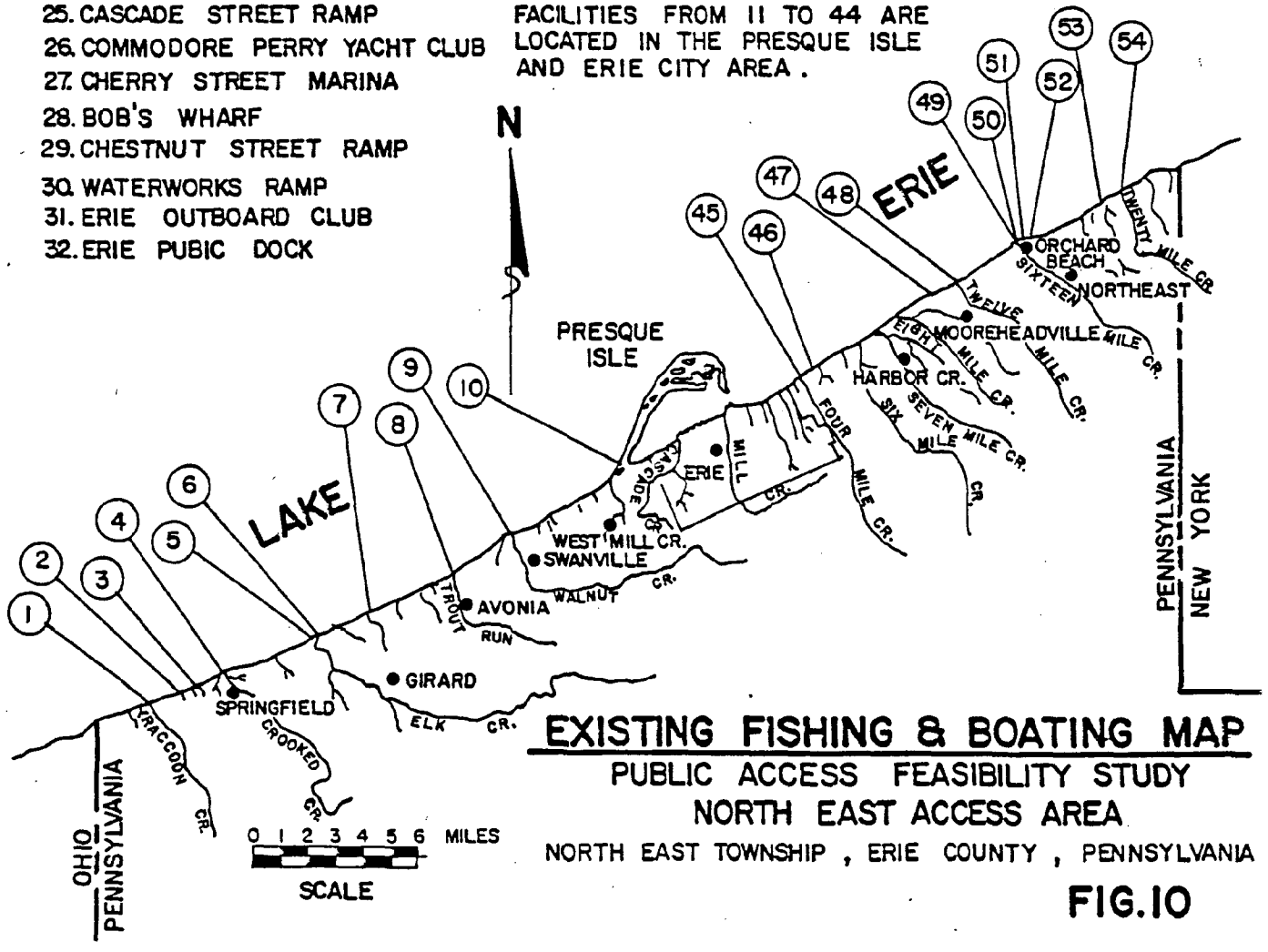
Inventory of Fishing and Boating Facilities for Lake Erie Along the Pennsylvania Shoreline

The following tables and map provide an inventory of the existing public access areas along Lake Erie and information on the facilities provided.

Although this inventory in itself does not address the specific needs for boating and fishing facilities, it does illustrate graphically that the ratio of existing facilities per mile of shoreline is substantially less for the area from the city of Erie east to the New York state line than the area from Erie west to the Ohio state line. Specifically there are two times as many public car stalls per mile to the west as east, 1.4 as many public car-trailer stalls per mile to the west and there are 5.3 times as many public launch ramps to the west than the east. This last item is even more significant as it is the presence of protected launch ramps which increase boating safety by providing better and quicker boat retrieval from the lake when storms occur.

1. RACCOON CREEK PARK
2. EAGLEY ROAD
3. VIRGINIA'S BEACH
4. CROOKED CREEK
5. ELK CREEK WEST BANK
6. ELK CREEK EAST BANK
7. GODFREY RUN
8. TROUT RUN
9. WALNUT CREEK
10. HANSEN'S BAIT
11. WEST POINT
12. SWAN COVE
13. NIAGARA BOAT RAMP
14. FERRY SLIP
15. PRESQUE ISLE MARINA
16. WEST PIER
17. EAST PIER
18. LONG POND, DUCK POND, BIG POND & HORSESHOE POND.
19. CRYSTAL POINT
20. LAGOON'S BOAT RAMP 1
21. LAGOON'S BOAT RAMP 2
22. STEFANS BOAT LIVERY
23. LAWRENCE PARKING
24. ERIE YACHT CLUB
25. CASCADE STREET RAMP
26. COMMODORE PERRY YACHT CLUB
27. CHERRY STREET MARINA
28. BOB'S WHARF
29. CHESTNUT STREET RAMP
30. WATERWORKS RAMP
31. ERIE OUTBOARD CLUB
32. ERIE PUBIC DOCK
33. PRESQUE ISLE YACHT CLUB
34. GEM CITY MARINA
35. PAASCH MARINA
36. WEST STATE STREET
37. ERIE MARINE
38. BROCKWAY MARINE
39. EAST STATE STREET
40. M & CALLISTER & SONS LTD.
41. BAYSHORE MARINE
42. NORTH & SOUTH PIERS
43. JOHN E. LAMPE MARINA
44. EAST AVENUE LAUNCH RAMP
45. FOUR MILE CREEK
46. LAWRENCE PARK FISHING CLUB
47. SHADES BEACH
48. TWELVE MILE CREEK (SHOREWOOD)
49. SIXTEEN MILE CREEK
50. FREEPORT YACHT CLUB
51. CHARLIE'S BOAT LIVERY
52. ORCHARD BEACH PARK ASSOCIATION PARK
53. NORTH EAST ACCESS AREA (DEWEY ROAD BOAT LAUNCH)
54. TWENTY MILE CREEK

NOTE:
FACILITIES FROM 11 TO 44 ARE LOCATED IN THE PRESQUE ISLE AND ERIE CITY AREA.

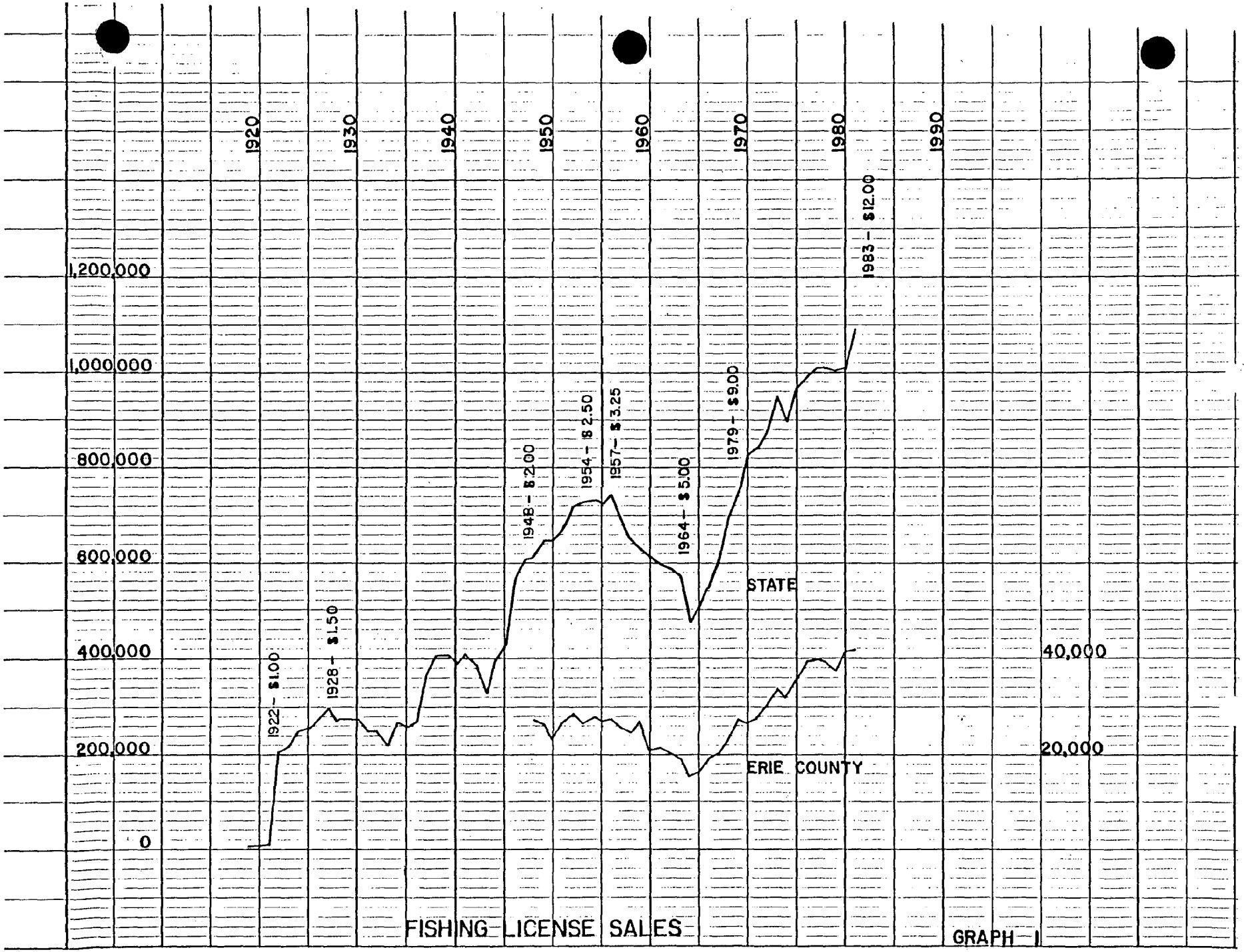


EXISTING FISHING & BOATING MAP

PUBLIC ACCESS FEASIBILITY STUDY
NORTH EAST ACCESS AREA

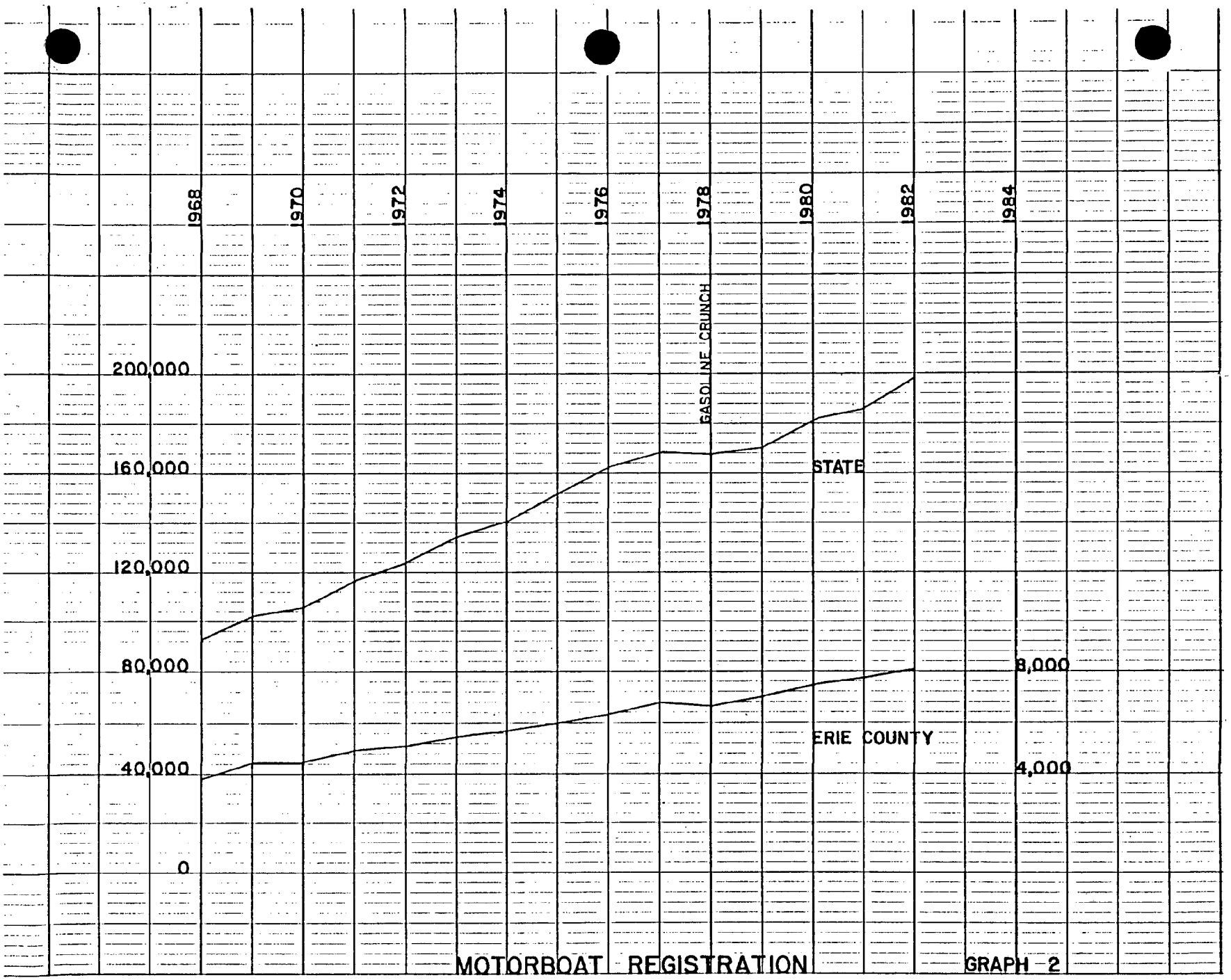
NORTH EAST TOWNSHIP, ERIE COUNTY, PENNSYLVANIA

FIG.10



FISHING LICENSE SALES

GRAPH 1



MOTORBOAT REGISTRATION GRAPH - 2

RAMPS & LIFTS	WEST	ERIE	EAST
Total Number of Ramps	10	16 (17-Lifts)	2 (4-Lifts)
Total Number of Public Ramps	7	14	1
Number of Boats that Could Be Launched at Same Time (Not Including Lifts)	11	26	2
Number of Ramps Per Mile of Shoreline	.45	4.2	.12
Number of Public Ramps Per Mile of Shoreline	.32	3.7	.06
Miles of Shoreline	22.1	3.8	17.1
PARKING			
Number of Car-Trailer Stalls	324	631	196
Number of Car Stalls	354	1,060	195
Number Car-Trailer Stalls per Mile Shoreline	14.7	166.1	11.5
Number Car Stalls Per Mile Shoreline	16.0	278.9	11.4
Number Car-Trailer & Car Stalls Per Mile	30.7	445.0	22.9
Number Public Car-Trailer Stalls	189	422	135
Number Public Car-Trailer Stalls Per Mile Shoreline	8.6	111.1	7.9
Number Public Car Stalls	224	590	90
Number Public Car Stalls Per Mile Shoreline	10.1	155.3	5.3
Number Public Sites W/Comfort Facilities	6	9	4
Number of Public Sites	4	22	4
Number of Private Sites	6	15	6

Y = Yes
N = No

ERIE SHORE PUBLIC ACCESS INVENTORY
(West of Erie)

Number	Area Name	Ramps					Parking					Fishing				Marina					Comfort Station			
		Yes/No	Number	Width	% Slope	Fee	Yes/No	Fee	Car Trailer	Car Only	Handicapped	Yes/No	Shore	Pier	Boat	Yes/No	Gas	Concession	Repairs	Boat Storage	Yes/No	Flush	Public	Private
1	Raccoon Creek Park	N Old	1 Ramp	12'	12% Unusable	N	Y	N	25	35	N	Y	Y	N	Y	N	N	N	N	N	Y	N	Y	
2	Eagley Road	N					Y	N	35	20	N	Y	Y	Y	N	N	N	N	N	N	Y	N	Y	
3	Virginia's Beach	Y	1	15'		Y	Y	Y	40	40	N	Y	Y	Y	Y	N	N	N	N	N	Y	N		Y
4	Crooked Creek	N					N					N	N	N	N	N	N	N	N	N	N	N		Y
5	Elk Creek West Bank	N					N					Y	Y	N	N	N	N	N	N	N	N	N	Y	
6	Elk Creek East Bank	Y	1	20'	12%	Y $3.	Y	Y $3./da.	50	30	N	Y	Y	N	Y	Y	Y	Y	N	73 slips	Y	Y		
7	Godfrey Run	N					N					Y	Y	N	N	N	N	N	N	N	N	N		
8	Trout Run	Y	1	10'		Y	Y	Y	25	30	N	Y	Y	Y	Y	Y	Y	N	N	30 slips	Y	Y		
9	Walnut Creek	Y	6	12'	12%	N	Y	N	129	169	Y	Y	Y	Y	Y	Y	N	N	N	73 slips	Y	Y	Y	

Y = Yes
N = No

ERIE SHORE PUBLIC ACCESS INVENTORY
(West of Erie)

Number	Area Name	Ramps					Parking					Fishing				Marina					Comfort Station			
		Yes/No	Number	Width	% Slope	Fee	Yes/No	Fee	Car Trailer	Car Only	Handicapped	Yes/No	Shore	Pier	Boat	Yes/No	Gas	Concession	Repairs	Boat Storage	Yes/No	Flush	Public	Private
0	Hansen's Bait	N					Y	Y	20	30	N	Y	Y	N	N	N	N	N	N	N	N			Y
	TOTALS FOR EACH ITEM	4	9	117'	N/A	3	7	4	324	354	1	9	9	4	5	3	2	1	0	175	6	3	4	6

Y = Yes
N = No

ERIE SHORE PUBLIC ACCESS INVENTORY
(Erie)

Number	Area Name	Ramps					Parking					Fishing				Marina					Comfort Station			
		Yes/No	Number	Width	% Slope	Fee	Yes/No	Fee	Car Trailer	Car Only	Handicapped	Yes/No	Shore	Pier	Boat	Yes/No	Gas	Concession	Repairs	Boat Storage	Yes/No	Flush	Public	Private
11	West Point	N					Y	N	0	10	N	Y	Y	N	N	N	N	N	N	N	N		Y	
12	Swan Cove	N					Y	N	0	30	N	Y	Y	N	N	N	N	N	N	N	Y	N	Y	
13	Niagara Boat Ramp	Y	1 1	15' 27'	10% 10%	N	Y	N	40	20	N	Y	Y	Y	Y	N	N	N	N	N	N		Y	
14	Ferry Slip	N					Y	N	N	30	N	Y	Y	N	N	N	N	N	N	N	N		Y	
15	Presque Isle Marina	Y	2 Hoists			N	Y	N	60	60	N	Y	Y	N	Y	Y	Y	N	N	500 Slips	Y	Y	Y	
16	East Pier	N					Y	N	0	30	N	Y	Y	N	N	N	N	N	N	N	N		Y	
17	West Pier (Channel)	Y	2	36'	15%	N	Y	N	30	80	N	Y	Y	Y	Y	N	N	N	N	N	N		Y	
18 A	Long Pond	N					Y	N	0	10	N	N	N	N	N	N	N	N	N	N	N		Y	

Y = Yes
N = No

ERIE SHORE PUBLIC ACCESS INVENTORY
(Erie)

Number	Area Name	Ramps					Parking					Fishing				Marina					Comfort Station			
		Yes/No	Number	Width	% Slope	Fee	Yes/No	Fee	Car Trailer	Car Only	Handicapped	Yes/No	Shore	Pier	Boat	Yes/No	Gas	Concession	Repairs	Boat Storage	Yes/No	Flush	Public	Private
8B	Duck Pond	N					Y	N	N	10	N	Y	Y	N	N	N	N	N	N	N	N		Y	
8C	Big Pond	N					Y	N	N	10	N	N	N	N	N	N	N	N	N	N	N		Y	
18D	Horseshoe Pond	N					Y	N	0	20	N	Y	Y	N	N	N	N	N	N	N	N		Y	
19	Crystal Point	N					Y	N	0	50	N	Y	Y	N	N	N	N	N	N	N	N		Y	
20	Lagoon's Boat Ramp #1	Y	1	12'	8%	N	Y	N	18	40	N	Y	Y	Y	Y	N	N	N	N	N	Y	N	Y	
21	Lagoon's Boat Ramp #2	Y	1	24'	14%	N	Y	N	45	20	N	Y	Y	Y	Y	N	N	N	N	N	Y	N	Y	
22	Stefan's Boat Livery	N					Y	N	N	30	N	Y	Y	N	Y	N	Y	Y	N	N	N			
23	Lawrence Park	Y	3	12'	10%	N	Y	N	20	20	N	Y	Y	Y	Y	N	N	N	N	N	N		Y	
24	Erie Yacht Club	Y	4 hoists 1 Ramp			Y	Y	N	75	80	N	Y	N	N	Y	Y	Y	Y	Y	439 Slips	Y	Y		

Y = Yes
N = No

ERIE SHORE PUBLIC ACCESS INVENTORY
(Erie)

Number	Area Name	Ramps					Parking					Fishing				Marina					Comfort Station			
		Yes/No	Number	Width	% Slope	Fee	Yes/No	Fee	Car Trailer	Car Only	Handicapped	Yes/No	Shore	Pier	Boat	Yes/No	Gas	Concession	Repairs	Boat Storage	Yes/No	Flush	Public	Private
25	Cascade St. Ramp	Y	1	45'	14%	N	Y	N	35	20	N	Y	Y	N	Y	N	N	N	N	N	N		Y	
26	Commodore Perry Yacht Club	Y	1 Lift			Y	Y	N	25	20	N	Y	N	N	Y	Y	N	Y	N	139 Slips	N			Y
27	Cherry St. Marina	Y	1 Lift			Y	Y	N	15	50	N	Y	N	N	Y	Y	Y	Y	Y	240 Slips	Y	Y		Y
28	Bob's Wharf	N					Y	N	0	20	N	N	N	N	N	Y	Y	N	N	30 Slips	N			Y
29	Chestnut St. Ramp	Y	2	12'	10%	N	Y	N	40	20	N	Y	N	N	Y	N	N	N	N	N	N	N	Y	
30	Waterwork's Ramp	Y	1	20'	10%	N	Y	N	20	10	N	Y	Y	N	Y	N	N	N	N	N	N		Y	
31	Erie Outboard Club	Y	1	20'	10%	N	Y	N	35	10	N	Y	N	N	Y	N	N	N	N	N	N			Y
32	Erie Public Dock	N					Y	N	0	100	N	Y	Y	Y	Car Top	N	N	N	N	N	N		Y	
33	Presque Isle Yacht Club	Y	1 Hoist				Y	N	5	10	N	Y	N	N	Y	Y	Y	Y	Y	90 Slips	N			Y

Y = Yes
N = No

ERIE SHORE PUBLIC ACCESS INVENTORY
(Erie)

Number	Area Name	Ramps					Parking					Fishing				Marina					Comfort Station			
		Yes/No	Number	Width	% Slope	Fee	Yes/No	Fee	Car Trailer	Car Only	Handicapped	Yes/No	Shore	Pier	Boat	Yes/No	Gas	Concession	Repairs	Boat Storage	Yes/No	Flush	Public	Private
34	Gem City Marina	Y	1 Hoist				Y	N	N	10	N	Y	N	N	Y	Y	Y	Y	Y	38 Slips	N			Y
35	Paasch Marine	N					Y	N	4	10	N	N	N	N	N	Y	N	N	Y	8 Slips	N			Y
36	West State St.	Y	1 Hoist				Y	N		On Street	N	Y	N	N	Y	N	N	N	N	54 Slips	N			Y
37	Erie Marine	Y	1 Hoist		2	Y 50 ft.	Y	N	20	30	N	Y	N	N	Y	Y	N	N	Y	60 Slips	N			Y
38	Brockway Marine	Y	3 Hoists				Y	N	10	30	N	Y	Y	N	Y	Y	Y	N	Y	100 Slips	N			Y
39	East State St.	N					Y	N	N	On Street	N	Y	Y	N	N	N	N	N	N	8 Slips	N			Y
40	McAllister & Son Ltd.	Y	2 Hoists		2	Y 50 ft.	Y	N	20	30	N	Y	N	N	Y	Y	Y	N	Y	95 Slips	Y	Y		Y
41	Bayshore Marine	N					Y	N	N	50	N	N	N	N	N	Y	Y	Y	Y	75 Slips	Y	Y		Y
42	North & South Piers	N					Y	N	N	30	N	Y	Y	Y	Y	N	N	N	N	N	N		Y	

Y = Yes
N = No

ERIE SHORE PUBLIC ACCESS INVENTORY
(Erie)

Number	Area Name	Ramps					Parking					Fishing				Marina					Comfort Station			
		Yes/No	Number	Width	% Slope	Fee	Yes/No	Fee	Car Trailer	Car Only	Handicapped	Yes/No	Shore	Pier	Boat	Yes/No	Gas	Concession	Repairs	Boat Storage	Yes/No	Flush	Public	Private
13	John Lampe Marina	Y	2	9'	15%	Y	Y	N	73	137	N	Y	N	N	Y	Y	Y	Y	N	115 Slips	Y	Y	Y	
44	East Avenue Launch Ramp	Y	1	24'	20%	N	Y	N	60	30	N	Y	Y	Y	Y	N	N	N	N	N	N		Y	
	TOTAL FOR EACH ITEM	21	16	367' 17 lifts	N/A	6	37	0	631	1,060	0	32	21	8	24	13	11	8	9	1,929	9	6	22	15

Y = Yes
N = No

ERIE SHORE PUBLIC ACCESS INVENTORY
(East of Erie)

Number	Area Name	Ramps					Parking					Fishing				Marina					Comfort Station			
		Yes/No	Number	Width	% Slope	Fee	Yes/No	Fee	Car Trailer	Car Only	Handicapped	Yes/No	Shore	Pier	Boat	Yes/No	Gas	Concession	Repairs	Boat Storage	Yes/No	Flush	Public	Private
45	Four Mile Creek	N					N					Y	Y	N	N	N	N	N	N	N	N		Y	
46	Lawrence Park Fishing Club	Y	1 Lift				Y	N	20	30	N	Y	Y	N	Y	Y	N	N	N	55 Slips	N			Y
47	Shades Beach	Y	~~Rail—6 Dolly~~				Y	N	40	10	N	Y	Y	Y	Y	N	N	N	N	N	Y	N	Y	
48	Twelve Mile Creek (Shorewood)	N				N	Y	N	25	10	N	Y	Y	N	N	N	N	N	N	N	N		Y	
49	Sixteen Mile Creek	N					Y	N	30	20	N	Y	Y	N	N	N	N	N	N	N	N		Y	
50	Freeport Yacht Club	Y	1 Lift			Y	Y	N	36	50	N	N	N	N	N	Y	N	N	N	28 Slips	Y	Y	Y	
51	Charlie's Boat Livery	Y	1	16'	$100 - Season $1 - In $1 - Out		Y	N	N	20	N	Y	Y	N	Y	Y	Y	Y	N	15 Slips	Y	Y		Y
52	Orchard Beach Park Assn. Pk.	N	1. Lift				Y	N	5	5	N	Y	N	N	Y	N	N	N	N	N	N			Y

Y = Yes
N = No

ERIE SHORE PUBLIC ACCESS INVENTORY
(East of Erie)

Number	Area Name	Ramps					Parking					Fishing				Marina					Comfort Station			
		Yes/No	Number	Width	% Slope	Fee	Yes/No	Fee	Car Trailer	Car Only	Handicapped	Yes/No	Shore	Pier	Boat	Yes/No	Gas	Concession	Repairs	Boat Storage	Yes/No	Flush	Public	Private
53	Northeast Access Area	Y	1	12'	13%	N	Y	N	40	50	N	Y	N	N	Y	N	N	N	N	N	Y		Y	
54	Twenty Mile Creek	N					N					Y	Y	N	N	N	N	N	N	N	N			Y
	TOTALS FOR EACH ITEM	6	2	28' 3 Lifts	N/A	2	9	0	196	195	0	9	7	1	5	3	1	1	0	98 Slips	4	2	6	4

COST COMPARISON

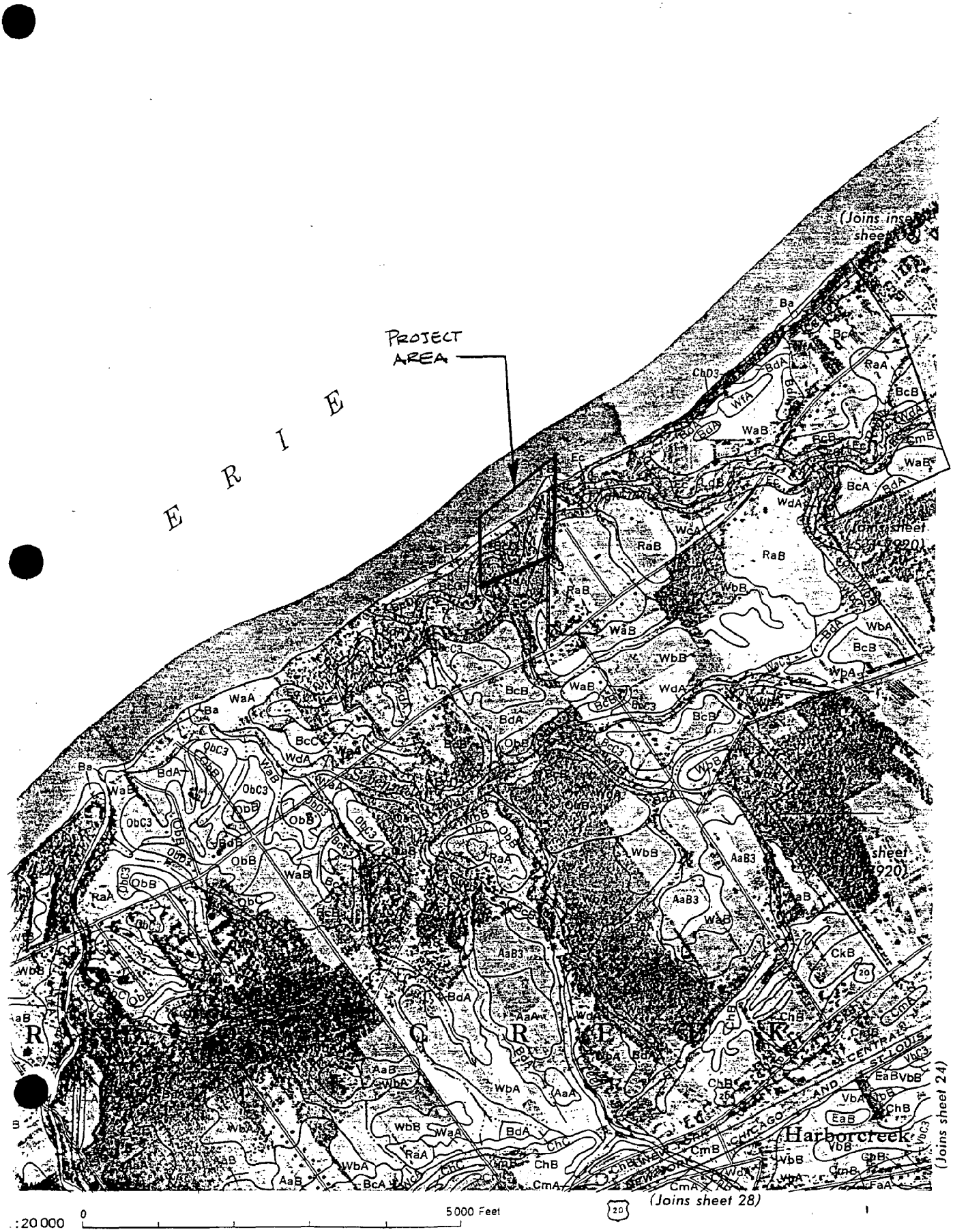
SHADES BEACH VERSUS OTHER EXISTING AND PROPOSED ACCESS SITES

COST COMPARISON PER PARKING SPACE AND LAUNCH RAMP LANE OF LAKE ERIE ACCESS SITES
(Dollar Figures in 1989 Dollars using ENR Construction Cost Index History Tables)

Site Name	Elk Creek West Bank	Walnut Creek	Lampe Marina	North East (Alt. 3 Mod.)	Shades Beach* Boat Launch
Site Description					
Ramp Lanes	1	6	4	6	10
Ramp Width	12 feet	72 feet	53	80 feet	180
Length of Road	1,400 feet	1,450 feet	1,500 feet	1,590 feet	2,500
No. of Parking Spaces	100	297	210	283	241+144**
Comfort Facilities	Yes	Yes	Yes	Yes	Yes
Breakwater	Yes	Yes	Yes	Yes	Yes
Lighting	Yes	Yes	Yes	Yes	Yes
Reference	DA Johnson & Assoc., Corry Study Estimated Cost	P.F.C. files Final Contract Cost	P.F.C. files Final Contract Cost	P.F.C. Estimated Cost	Northwest Engineering Estimated Cost
Work Item					
Access Road & Parking	290,980	530,300	271,830	582,350	558,142***
Comfort Facilities	119,610	286,740	268,820	107,060	30,000
Lighting	1,700	78,620	31,460	17,150	7,000
Boat Launching Ramp	43,390	58,580		105,580	355,041
Channel Improvements	45,120	42,910	161,470		
Breakwaters	312,500	1,076,970	1,920,760	1,338,090	669,221
Total Cost	813,300	2,074,120	2,654,340	2,150,230	1,626,404
Cost Per Launch Ramp Lane	813,300	345,687	663,585	358,372	161,940
Cost/Per Parking Space	8,133	6,984	12,640	7,598	6,720

*Beach sand not included
**241 Trailer spaces + 144 parking spaces for beach and park use
***Cost includes user fee collection booth

ERIE COUNTY SOILS MAPPING


N
PROJECT AREA
E R I E
(Joins inset sheet 23)
(Joins sheet 24)
(Joins sheet 28)
Harborcreek
CHICAGO AND ST. LOUIS
NEW YORK CENTRAL
20
0
5000 Feet
:20 000

vegetables and fruits. The parent material was acid, la-
·ine sands that were sorted and deposited by water.
_nese soils are low in clay; consequently, plant nutri-
ents leach downward readily. A firm layer, or pan, that is slowly permeable to air and water is 20 to 30 inches below the surface. At depths of 40 to 72 inches is gray, calcareous material that is also slowly permeable to air and water. When saturated with water, this material is known locally as quicksand.

The Berrien soils are in the same catena as the well-drained Ottawa soils, the somewhat poorly drained to poorly drained Rimer soils, and the very poorly drained Wauseon soils.

The native vegetation consisted of an oak-beech-maple type of forest. Now, aspen, goldenrod, little bluestem, povertygrass, broomsedge, cinquefoil, and sheep sorrel grow in idle areas.

Typical profile of a Berrien fine sandy loam (cultivated):

0 to 7 inches, dark-brown fine sandy loam; strong, medium, granular structure; friable when moist; pH 6.2; abrupt, smooth lower boundary.
7 to 9 inches, yellowish-brown very fine sandy loam; moderate, coarse, subangular blocky structure; friable when moist; pH 6.0; clear, smooth lower boundary.
9 to 20 inches, yellowish-brown very fine sandy loam; moderate, medium, subangular blocky structure; friable when moist; pH 6.0; diffuse, smooth lower boundary.
20 to 28 inches, dark yellowish-brown very fine sandy loam with common, coarse, prominent mottles of reddish brown and olive brown; moderate, medium, subangular blocky structure; friable to firm when moist; pH 5.8; clear, smooth lower boundary.
28 to 34 inches, variegated dark reddish-brown and dark yellowish-brown fine sandy loam; strong, coarse, blocky structure; hard when dry, firm when moist, and nonsticky whe wet; pH 5.8; clear, wavy lower boundary.
34 to 40 inches, dark-brown loamy sand; single grain (structureless); pH 6.0; abrupt, wavy lower boundary.
40 to 60 inches+, gray sandy clay; massive (structureless); very hard when dry, plastic when wet; calcareous.

In forested areas the surface is covered with leaf litter from mixed hardwoods. In these areas there is a layer of leaf mold about one-half inch thick and a clear, smooth boundary between the leaf mold and the mineral soil.

Berrien fine sandy loam, 0 to 2 percent slopes (BcA).—The profile of this soil resembles the profile described for the series. In most places, however, the surface layer is 1 to 3 inches thicker. Although the soil is level to nearly level, moisture infiltrates rapidly and there is little ponding of surface water. Internal drainage is moderate.

This soil is suited to vegetables and fruits. It is too droughty for high yields of small grains and permanent pasture. In spring the soil remains wet long enough to delay the planting of crops.

This soil needs careful management. Maintain good tilth by adding organic matter often; plow only when the soil contains plenty of moisture and after the danger of freezing has passed in spring.

Because of its moderate internal drainage, this soil is in capability unit IIw–1.

Berrien fine sandy loam, 2 to 8 percent slopes (BcB).—The profile of this soil is the same as the profile described for the series. The soil has uniform slopes that are gen-
·ally less than 500 feet long. Surface drainage is good,
d internal drainage is moderate.

This soil is suited to vineyards and fruit trees. It is too droughty for high yields of small grains and permanent pasture.

The soil needs careful management. Maintain good tilth by adding organic matter often; plow only when the soil contains plenty of moisture and after the danger of freezing has passed in spring.

Because of the risk of erosion and the moderate internal drainage, this soil is in capability unit IIew–2.

Berrien fine sandy loam, 2 to 8 percent slopes, severely eroded (BcB3).—The profile of this soil resembles the profile described for the series, but the surface layer is lighter colored and is less than 4 inches thick. The soil also contains less organic matter and is shallower. Where the soil has been cultivated, yellowish-brown sand is mixed with the surface soil.

This soil is suited to vegetables and fruits. It is too droughty for high yields of small grains and permanent pasture. The soil layers over the pan are thin. In spring they remain wet long enough to delay the planting of crops.

This soil needs careful management. Maintain good tilth by adding organic matter often; plow only when the soil contains plenty of moisture and after the danger of freezing has passed in spring. Divert surface water from adjoining higher areas.

Because of the effects of erosion and the moderate internal drainage, this soil is in capability unit IIIew–2.

Berrien fine sandy loam, 8 to 15 percent slopes (BcC).—The profile of this soil resembles the profile described for the series, but the surface soil is only 6 inches thick. The slopes are uniform and are generally less than 300 feet long. Surface drainage is good, and internal drainage is moderate.

This soil is suited to vegetables and fruits. It is too droughty for high yields of small grains and permanent pasture.

This soil needs careful management. Maintain good tilth by adding organic matter often; plow only when there is plenty of moisture in the soil and after the danger of freezing has passed in spring.

Because of the risk of erosion and the moderate internal drainage, this soil is in capability unit IIIew–2.

Berrien fine sandy loam, 8 to 15 percent slopes, severely eroded (BcC3).—The surface layer of this soil is lighter colored than that of the profile described for the series and is less than 4 inches thick. In addition, the soil contains less organic matter and is shallower above the pan layer. Where the soil has been cultivated, part of the yellowish-brown sand from the subsoil has been mixed with the surface soil.

This soil is best suited to grasses and legumes. Choose hay mixtures that tolerate short droughts and moderate internal drainage. The soil is too droughty for high yields of permanent pasture.

Because of the effects of erosion and the moderate internal drainage this soil is in capability unit IVew–1.

Berrien fine sandy loam, 15 to 25 percent slopes (BcD).—The profile of this soil resembles the profile described for the series, but the surface layer is only 6 inches thick. The soil has uniform slopes that are mostly less than 200 feet long. Surface drainage is good to excessive, and internal drainage is moderate.

This soil is suited to grasses and legumes. Choose hay mixtures that tolerate short droughts and moderate internal drainage. The soil is too droughty for high yields of permanent pasture.

Because of the risk of erosion and the moderate internal drainage, this soil is in capability unit IVew–1.

Berrien fine sandy loam, 15 to 25 percent slopes, severely eroded (BcD3).—The surface layer of this soil is lighter colored than that of the profile described for the series and is only 5 inches thick. In addition, the soil contains less organic matter and is shallower above the pan layer. Where the soil has been cultivated, part of the yellowish-brown sand in the subsoil has been mixed with the surface soil.

This soil is suitable as woodland. Because of the effects of erosion, it is in capability unit VIIe–2.

Birdsall Series

The Birdsall soils are very poorly drained to poorly drained and are silty and deep. They are inextensive and occur in small, level to gently sloping areas. Their parent material was lacustrine deposits of glacial origin. It consisted of stratified silt and clay, mixed with some sand, laid down in still, or slack, water.

Where they occur in the same fields with better drained soils that are cultivated, these wet soils present a management problem. They are darker than the better drained soils and can be identified easily by their very dark grayish-brown to very dark gray surface soil. The Birdsall soils are slowly permeable to air and water.

The Birdsall soils are in the same catena as the moderately well drained Williamson and Collamer soils and the somewhat poorly drained to poorly drained Wallington soils.

Originally, willow, aspen, and other bog plants grew on these soils. This vegetation was replaced largely by a white or black ash-red maple type of swamp forest. Aspen, willow, and sedges still grow in idle areas.

Typical profile of a Birdsall silt loam:

0 to 10 inches, very dark grayish-brown silt loam; moderate, fine, granular structure; friable when moist; pH 5.4; diffuse, smooth lower boundary.

10 to 18 inches, yellowish-brown silt loam with many, fine, distinct mottles of grayish brown; moderate, medium, granular structure; friable when moist; pH 5.4; clear, smooth lower boundary.

18 to 26 inches, yellowish-brown silty clay loam with common, coarse, distinct mottles of grayish brown; moderate, medium, subangular blocky structure; hard when dry, firm when moist, and sticky when wet; pH 6.0; gradual, smooth lower boundary.

26 to 36 inches, dark grayish-brown silty clay loam with common, medium, distinct mottles of yellowish brown; weak, medium, subangular blocky structure; hard when dry, firm when moist, and nonsticky when wet; pH 6.4.

The color of the surface soil ranges from very dark grayish brown to very dark gray. The color of the subsoil ranges from yellowish brown through grayish brown to gray.

Birdsall silt loam, 0 to 2 percent slopes (BdA).—The profile of this soil is the same as the profile described for the series. Relief is level to nearly level. Surface and internal drainage are very poor. During wet seasons shallow water remains in the depressions for several weeks.

Included with this mapping unit are a few small ar of Lorain silty clay loam and Lorain clay, which are mapped separately in this county. These included s are very poorly drained, and the lower part of the pro is calcareous.

This soil, unless improved by drainage, is best suited permanent sod or woodland. With adequate artific drainage, it can be used in a rotation that includes r crops.

Because of the severe limitation of wetness, this soil in capability unit IVw–1.

Birdsall silt loam, 2 to 4 percent slopes (BdB).—T profile of this soil resembles the profile described for t series, but the surface layer is only 8 inches thick. Reli is gently sloping. Surface drainage is moderate, and i ternal drainage is poor.

This soil, unless improved by drainage, is best suited r permanent pasture and woodland. With adequate art ficial drainage, it can be used in a rotation that include row crops. Keep the natural drainageways open. Diver surface water from adjoining higher areas into suitabl waterways.

Because of the severe limitation of wetness, this soil i in capability unit IVw–1.

Canadice Series

The Canadice series consists of deep, poorly drained silty soils that have a subsoil of silty clay loam or silty clay. The soils have a strong, well-developed structure. They occur in old glacial lakebeds. The parent material was laid down in still, or slack, water. It contains sediments weathered from bedrock of acid shale in addition to limestone material carried by glaciers and deposited in the lakes by streams. This material was laid down in alternate layers of silt and clay.

Because they are high in silt, these soils dry out slowly in spring and become wet early in fall. Below a depth of 8 inches, the layers of silty clay loam and silty clay are slowly permeable to air and water.

The Canadice soils are in the same catena as the moderately well drained Caneadea and the very poorly drained to poorly drained Birdsall soils.

The native vegetation consisted of a beech-red maple type of forest. Now, wild crabapple, aspen, sumac, goldenrod, velvetgrass, and povertygrass grow in idle areas.

Typical profile of a Canadice silt loam (cultivated):

0 to 8 inches, brown to dark-brown silt loam; moderate, medium, granular structure; friable when moist; pH 5.6; abrupt, smooth lower boundary.

8 to 14 inches, yellowish-brown silty clay loam with common, medium, distinct mottles of grayish brown and dark brown; strong, thick, platy structure; friable when moist; pH 5.4; clear, smooth lower boundary.

14 to 24 inches, silty clay loam with a prominent coating of gray clay on peds; interiors are light olive brown with many, fine, distinct mottles of dark brown to strong brown; strong, medium, blocky structure; firm when moist; pH 5.8; clear, smooth lower boundary.

24 to 30 inches, silty clay with a prominent coating of gray clay on peds; olive-brown interiors; strong, coarse, blocky structure; firm when moist, hard when dry, and plastic when wet; pH 6.5; diffuse, wavy lower boundary.

30 to 38 inches, silty clay with a gray coating on peds; olive-brown interiors; strong, very coarse blocky structure; hard when dry, firm when moist, and plastic when wet; pH 7.2; diffuse, wavy lower boundary.

ESTIMATED SOIL PROPERTIES SIGNIFICANT TO ENGINEERING

TABLE 2

ERIE COUNTY , PENNSYLVANIA

Soil Series and Map Symbol	Depth to --- Seasonal high water table (feet)	Depth to --- Bedrock (feet)	Depth from Surface (typical) profile) (inches)	Coarse fraction greater than 3 inches (percent)	Percentage passing sieve --- No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)	Engineering classification Unified	AASHO	USDA Texture (typical profile)	Range in permeability (inches per hour)	Range in available moisture capacity (inches per in. of depth)	Reaction Range in pH	Optimum moisture for compaction (percent)	Maximum dry density (pounds per cubic foot)	Shrink - swell potential	Corrosion Potential steel/concrete
Alden (mapped only with Ellery in EaB)	0	5+	0-7	0-5	95-100	85-100	85-100	80-100	ML, CL	A-4,A-6	silt loam	0.63-2.0	.18-.25	6.1-7.3	-	-	low	high/moderate
			7-30	0-5	90-100	85-100	85-100	80-100	ML, CL	A-4,A-6, A-7	silt loam to silty clay loam	< 0.2	.17-.22	6.1-7.3	14-18	105-115	moderate	high/moderate
			30-60	5-15	70-90	65-90	50-80	40-65	GM, GC, ML, CL	A-4,A-6	gravelly loam	< 0.2	.10-.15	6.6-7.3	11-15	114-125	moderate	high/low
Allis (AaA,AaA3,AaB, AaB3,AaC,AaC3, AaD,AaD3,AaE)	0-1	1½-3½ shale	0-30	-	60-100	50-100	45-90	45-90	ML, CL, GM, GC	A-4,A-6, A-7	shaly silt loam to shaly silty clay	< 0.2	.08-.14	4.5-5.5	14-20	114-122	moderate	high/high
			30+	FRACTURED SHALE BEDROCK														
Beach and Riverwash (Ba)	TOO VARIABLE TO ESTIMATE-REQUIRES ON-SITE INVESTIGATION																	
Beach sand, stabilized (Bb)	TOO VARIABLE TO ESTIMATE-REQUIRES ON-SITE INVESTIGATION																	
Borrion (BcA,BcB,BcB3, BcC,BcC3,BcD, BcD3)	1-2	5+	0-7	-	95-100	90-100	80-95	20-30	SM	A-2	fine sandy loam	0.63-2.0	.14-.16	6.1-7.3	-	-	low	high/low
			7-40	-	95-100	90-100	80-95	15-30	SM	A-2	very fine sandy loam to fine sandy loam	0.63-2.0	.12-.14	6.1-7.3	-	-	low	high/low
			40-60	-	100	95-100	90-95	65-75	ML	A-4	silt loam	< 0.2	.12-.14	7.4-7.8	-	-	low	high/low
Birdsall (BdA,BdB)	0-½	6+	0-10	-	90-100	90-100	85-100	80-95	ML, CL	A-6,A-7	silt loam	0.63-2.0	.16-.20	5.1-6.5	-	-	moderate	high/moderate
			10-60	-	95-100	90-100	85-100	65-90	ML, CL	A-6,A-7	silt loam	< 0.2	.10-.14	5.1-6.5	10-18	90-100	moderate	high/moderate

Rev. July 1967

Engineering Report

ON

SUBSURFACE EXPLORATION
FOR THE
SHADES BEACH RESTORATION PROJECT
HARBORCREEK TOWNSHIP
ERIE COUNTY, PENNSYLVANIA

SUBMITTED TO

Northwest Engineering, Inc.
R.D. 1, P.O. Box Q
Tidioute, Pennsylvania 16351

Attention: Mr. Mark J. Corey

DATE

April 28, 1989

JOHN N. CERNICA & ASSOCIATES
CONSULTING ENGINEERS
YOUNGSTOWN, OHIO

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INTRODUCTION

This report describes the subsurface exploration for the Shades Beach Restoration Project. The site is located in Harborcreek Township, Erie County, Pennsylvania.

The historical geology of the area was reviewed and compared with the general subsurface information collected by the field borings. The subsurface soil and rock conditions were explored by 4 borings. The samples secured during the drillings were used to classify soil and rock types and to conduct direct shear and grain-size tests. The results of these tests, along with the information collected in the field, provide the basis for determining some properties and characteristics of the soil and rock at this site.

This subsurface study was initiated by Mr. Mark J. Corey of Northwest Engineering, Inc., Tidioute, Pennsylvania. Drilling and sampling were performed by Lininger Drilling & Pumps Company, Inc., of Greenville, Pennsylvania.

SUBSURFACE EXPLORATION

Subsurface explorations were performed by **Lininger Drilling & Pumps Company, Inc., of Greenville, Pennsylvania** on **April 5, 1989. Four (4)** borings were drilled on this day. The purpose of the borings was to obtain information about the underlying soil and rock strata "near" the proposed breakwater wall site; exploration of the actual site was not done due to the high cost. The location of the borings is shown on the boring layout on page 5. The depths of the borings are tabulated below:

BORING	DEPTH
1	8.1'
2	5.5'
3	5.6'
4	4.1'

During the drilling, the subsurface strata was closely observed by the driller and samples were taken at all changes in soil or rock types. Samples were obtained by the standard split spoon sampler during which the resistance to penetration was observed by the standard penetration test. The number of blows of the 140 pound hammer falling freely for a distance of 30 inches was recorded for a total of 18 inches or the depth of penetration in each sampling. The number of blows required to drive the sample the last 12 inches is an approximate measure of the relative density of the soil or hardness of the rock. This information is correlated with the laboratory test results to determine the properties and characteristics of the soil and rock.

The stratification of the subsurface soil and rock is shown in the boring

logs on pages 10 through 13.

A stratum of predominantly sand and gravel, with a trace to some silt was first found to the 8', 3', 5', and 4' depth in borings 1 through 4, respectively. Shale and rock fragments were also found in this stratum in borings 1 and 3. Gray sandy silt was found between the 3' and 5' depths in boring 2. For the remaining few inches of drilling in all 4 borings auger refusal was met, and gray shale was encountered.

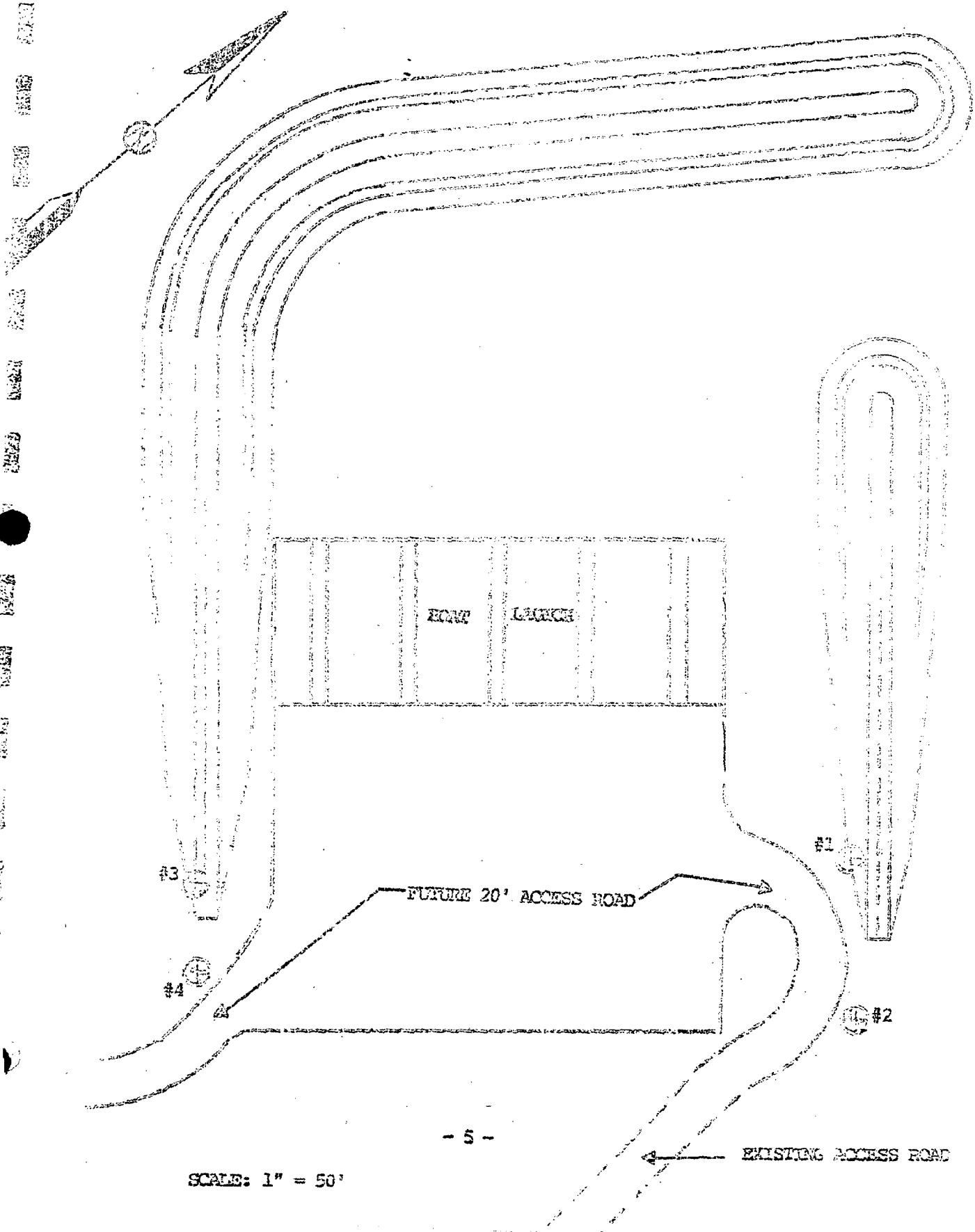
During the period of drilling, water levels were observed and recorded by the driller. Water levels were found at the 6', 5.5', and 2' depths of borings 1, 3, and 4, respectively. Boring 2 was reported to be dry at the completion of drilling.

The subsurface conditions and stratification described in this report at the respective boring locations does not imply conformity with these conditions and stratification at locations between borings, nor at the proposed building site (virtually under water).

LABORATORY TESTING

A testing program was set up in the laboratory to obtain information about the subsurface soil strata, so that a partial determination could be made of some of the properties and characteristics. Soil samples were tested for grain size and direct shear. The results of these tests are tabulated on pages 6 through 9.

BORING LAYOUT



SCALE: 1" = 50'

TABULATION OF TEST RESULTS

PROJECT: Shades Beach Breakwater Project

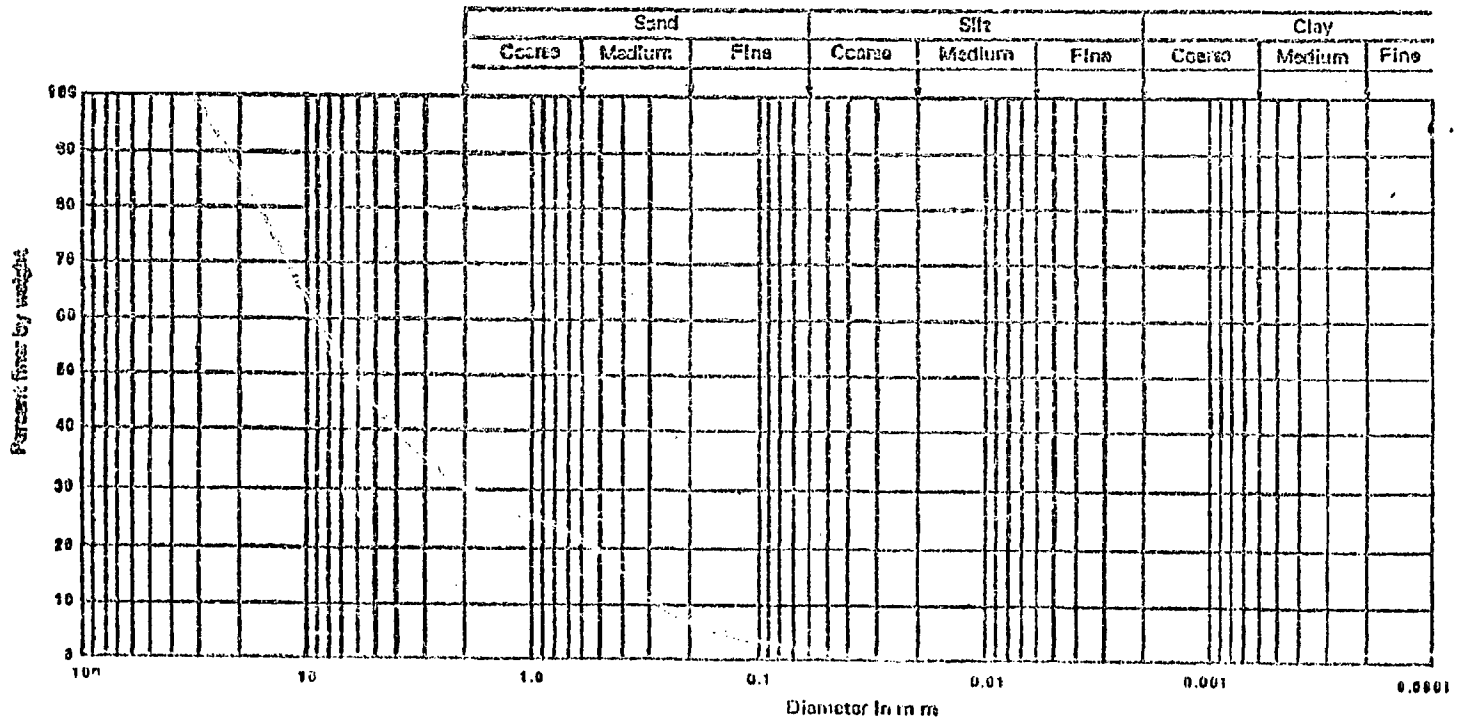
BORING NUMBER	SAMPLE NUMBER	SAMPLE DEPTH (feet)	WATER CONTENT %	UNIT WT. (In Situ) (lbs./cu.ft.) WET	UNIT WT. (In Situ) (lbs./cu.ft.) DRY	ULTIMATE COMPRESSIVE STRENGTH (Kips/sq.ft.)	ANGLE OF INTERNAL FRICTION (degree)	"C" FACTOR (lbs./sq.ft.)
1	A&1	0'-5.5'	---	---	---	---	37.3	120
3	A&1	0'-5'	---	---	---	---	38.0	192
4	A	0'-4'	---	---	---	---	39.0	60

JOHN N. CERNICA & ASSOCIATES
CONSULTING ENGINEERS

GRAIN SIZE ANALYSIS

Specimen 1 - A & 1

Depth 0' - 5.5'

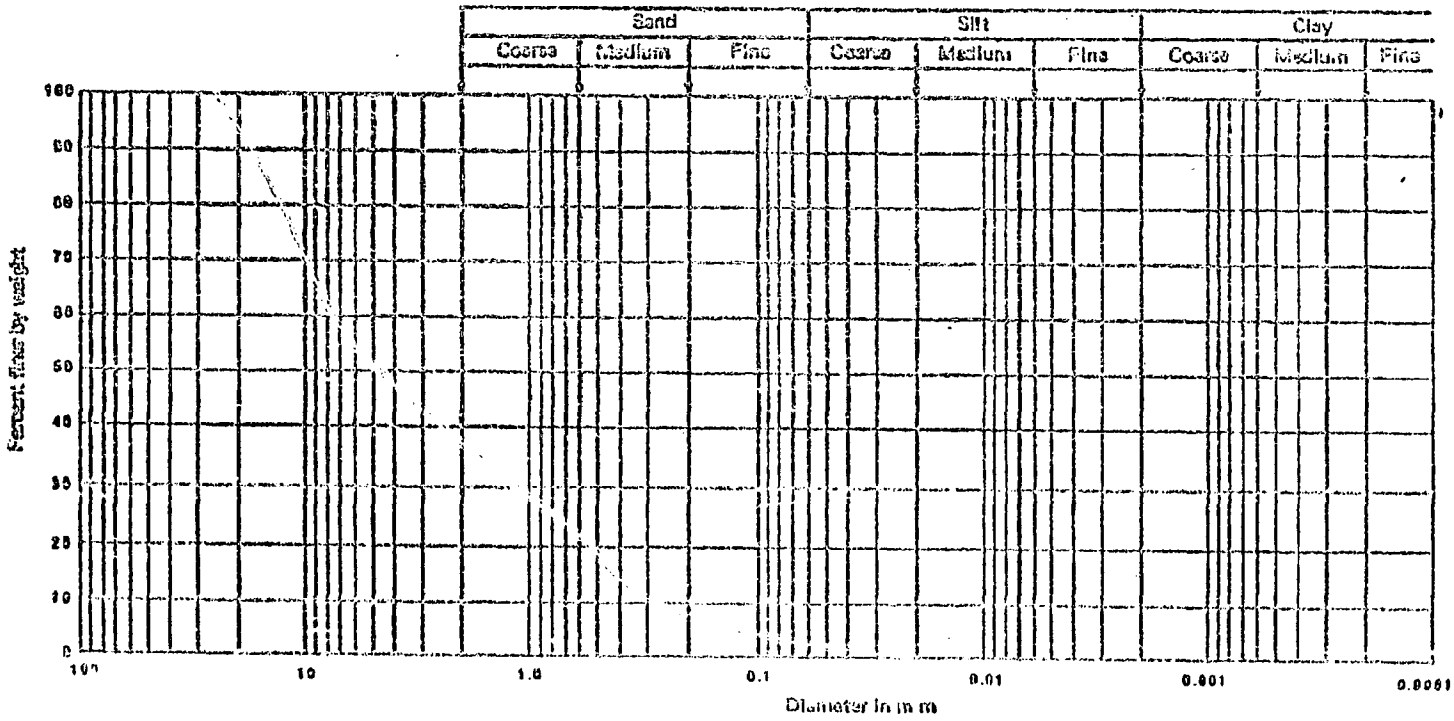


JOHN N. CERNICA & ASSOCIATES

GRAIN SIZE ANALYSIS

Specimen 3 - A & 1

Depth 0' - 5'

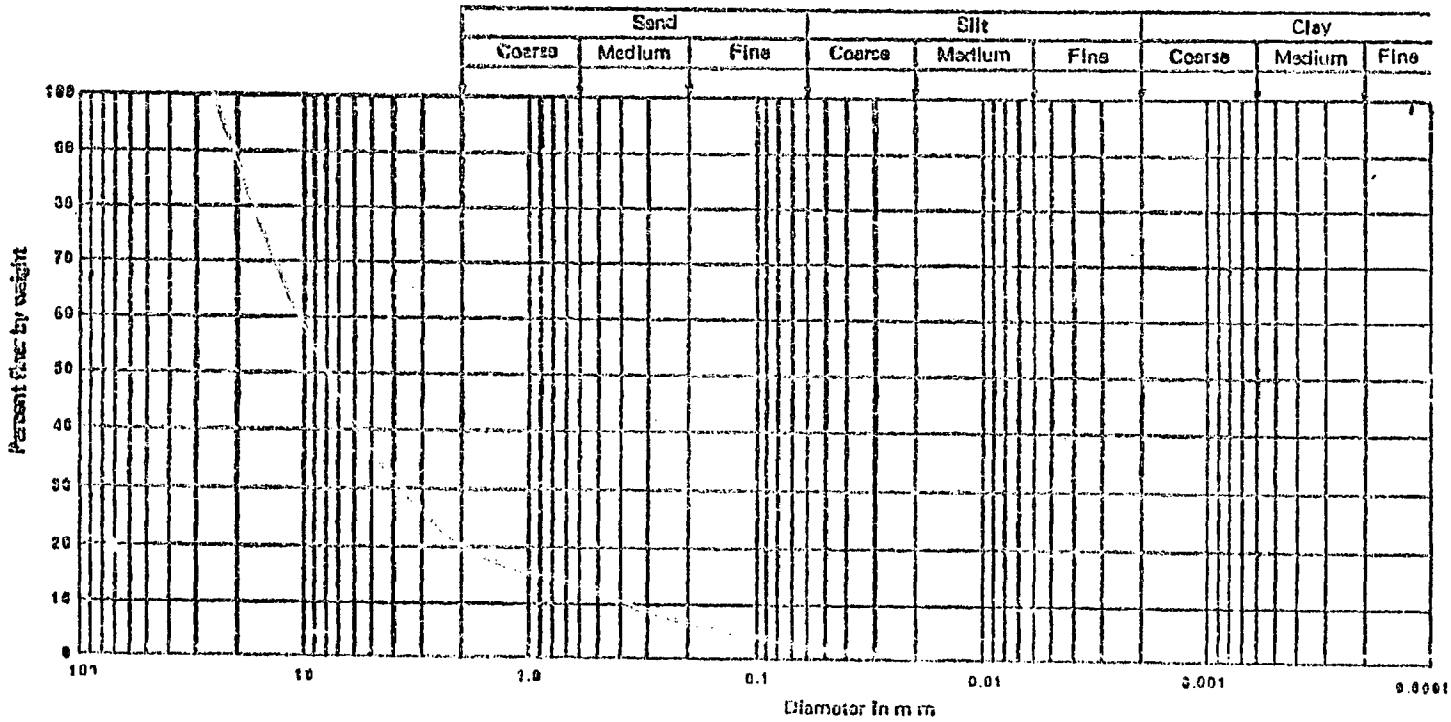


JOHN N. CERNICA & ASSOCIATES

GRAIN SIZE ANALYSIS

Specimen 4 - A

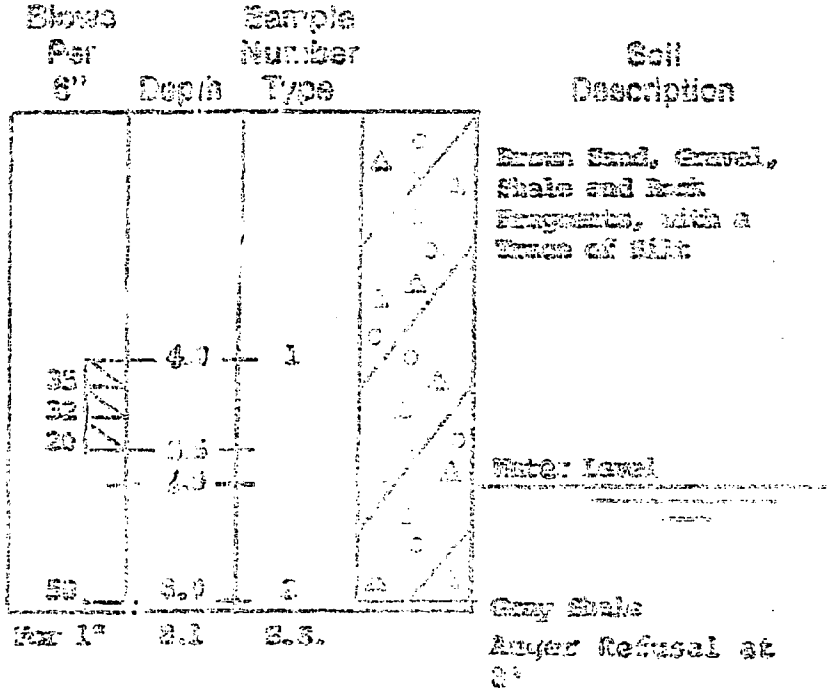
Depth 0' - 4'



JOHN N. CERNICA & ASSOCIATES

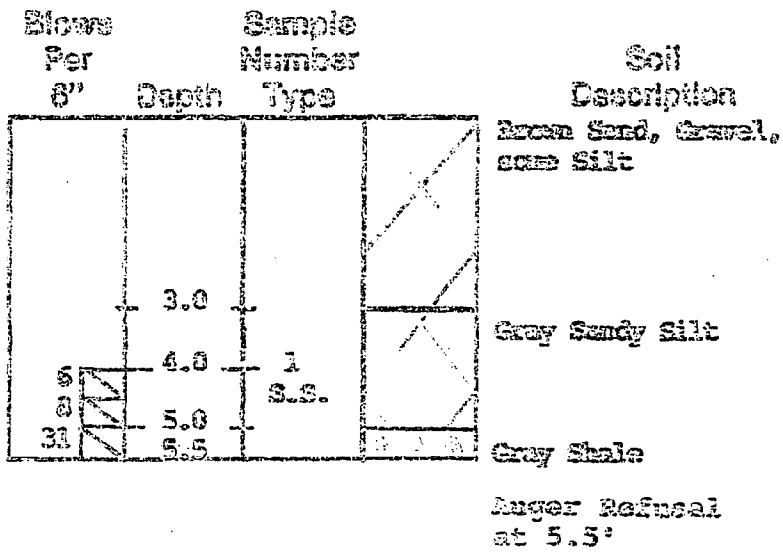
BORING LOG -- Boring # 1

Elevation at top of hole 573.5



BORING LOG — Boring # 2

Elevation at top of hole 579.5



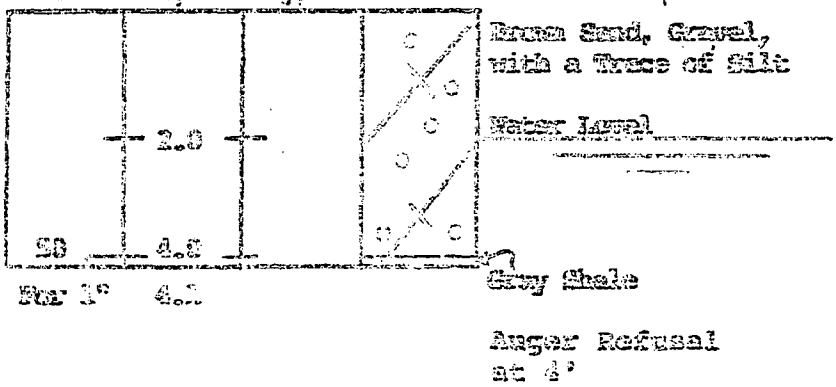
BORING LOG -- Boring 3

Elevation at top of hole 573.5

Blows Per 6"	Depth	Sample Number/ Type	Soil Description
			Brown Sand, Gravel, Shale Fragments, with a Trace to some Silt
			Water Level
			Gray Shale
			Auger Refusal at 5.5'

BORING LOG — Boring # 4

Elevation at top of hole 577.5



CONCLUSION

As indicated earlier in the report the purpose of this subsurface exploration was to determine the general stratification near the building site. That is, the proposed breakwall construction would be in the water. However, to drill and sample along the proposed building line proved to be expensive, and subsequent to consultation with the owner, Northwest Engineering limited the drilling and sampling to the nearby shore, in anticipation that the characteristics of the off-shore site are similar to those along the shore line where exploration was conducted.

Generally, the upper strata consists of a mixture of sand and gravel with varying percentage of silts, and an insignificant trace of clay. This strata varies in thickness from 4 to 8 feet. Under this is a rock formation. The drilling stopped within a few inches from the surface of the rock. The water level varied in the various borings, with boring no. 2 reported dry at the time of drilling. This information is shown on the boring logs, pages 10 through 13. Assuming the rock formation to be at comparable depths below the soil surface in the lake, it is deemed advisable that the breakwall base rest directly on rock. Thus, one would be able to minimize erosion which may undermine the wall foundation if the wall were to rest on or near the soil surface.

Needless to say, it is perhaps a conjecture at this point as to the actual conditions existing at the proposed site. This point should be carefully scrutinized and addressed in the construction specifications in order to eliminate misunderstanding later.

If there are any questions regarding any of the above, please do not hesitate to contact this office.

John N. Cernica & Associates

Consulting Engineers

7240 Glenwood Ave. • Youngstown, Ohio 44512 • Telephone: (216) 758-2100

March 17, 1989

RECEIVED
MAR 20 1989
NORTHWEST ENGINEERING INC.

Northwest Engineering, Incorporated
R.D. #1
P.O. Box Q
Tidioute, Pennsylvania 16351

Attention: Mr. Jim Murphy

Re: Soil & Subsurface Exploration
Shade's Beach
Harbour Creek Township, Pennsylvania

Dear Mr. Jim:

Pursuant to your request, I should like to submit the following proposal to cover the Soil and Subsurface Exploration for the above-mentioned site.

The proposal is divided into two parts: Drilling and Engineering. The drilling will be done by the J. E. Lininger Drilling Company, Greenville, Pennsylvania. They have submitted the following price breakdown.

DRILLING & SAMPLING:

ITEM	UNITS	UNIT COST	TOTAL
Moving & Mobilization			$ 125.00
Drilling & Sampling	100 ft.	7.50/ per ft.	750.00
Shelby Tube	4	30.00/ea.	120.00
Split Spoons			No Charge
		TOTAL	$ 995.00

The cost for the engineering-related services is as follows:

ENGINEERING-RELATED SERVICES:

ITEM	UNITS	UNIT COST	TOTAL
Water Content	4	15.00/ea.	60.00
Density	4	20.00/ea.	80.00
Unconfined Compression	4	25.00/ea.	100.00
Grain Size Analysis	4	85.00/ea.	340.00
Direct Shear	4	85.00/ea.	340.00
Classification			80.00
Write up, Evaluation & Recommendations			750.00
Typing and Reproduction			60.00
		TOTAL	$1,810.00

Based on the above estimates, the total cost for drilling and engineering is $2,805.00. Please note that we did not have any cost for the layout of borings; it is assumed that your office will provide the boring locations and elevations, so that we could include this information in our report.

As we discussed on the phone, the stratification at the proposed boring location may or may not be identical to that under the proposed breakwater foundations, a fact that you pointed out to the owner (as per our conversation). Because of the very high cost, the owner decided to proceed with this alternative. Thus, if, during construction, some changes appear relevant, this should not be a surprise to the owner--something that should be reiterated to the owner at this time in order to eliminate misunderstanding later.

We can commence drilling and sampling within a few days from the time we

receive authorization to proceed. Furthermore, we can give you a preliminary assessment of our findings within two to three days from completion of drilling; a formal report will follow within approximately two weeks from completion of drilling.

I trust that the above meets with your requests.

Sincerely yours,

John N. Cernica, P. E., Ph. D.

JNC/sc

CORRESPONDENCE

CORRESPONDENCE

In the Army Corps of Engineers Initial Appraisal Report on Shades Beach, there was a section entitled "Environmental Considerations" that attempted to assess the environmental impact on the subject project area by contacting certain environmental regulatory agencies that had jurisdiction over the site.

The agencies that they contacted were:

U.S. Army Corps of Engineers - Buffalo (informal contact)
U.S. Department of Interior - Fish & Wildlife Service
U.S. Environmental Protection Agency
U.S. Department of Agriculture - Soil Conservation Service
Federal Highway Administration
U.S. Coast Guard
Pennsylvania Department of Environmental Resources
Pennsylvania Fish Commission
Pennsylvania Game Commission
Pennsylvania Coastal Zone Management Office
Pennsylvania Historical & Museum Commission
Erie County Department of Planning
Harborcreek Township Supervisors

In the preparation of this Report, letters were sent to several regulatory agencies that would have jurisdiction in this project. The purpose of this correspondence was to update the agencies on the progress of the project since the Corps' "Initial Appraisal Report" to determine what permits would ultimately be required.

The budget for this Report did not include funds necessary to obtain these permits but these permits must be obtained before construction commences. Delaying the acquisition of these permits is cost effective since this project may not go to construction for several years. Undoubtedly, in the interim, regulations shall change and permits would expire before construction commences, thus duplicating permitting efforts. However, due to some of the site conditions that are unique to this project, we are able to respond to certain agencies' requests by applying for waivers for permits or requirements.

The Pennsylvania Historical & Museum Commission requested a Phase I Archaeological Survey to be performed at the site due to the high potential for submerged or above ground prehistoric or historic archaeological sites or cultural resources. But due to the previously disturbed site due to its past use as a boat launch ramp and beach plus actual geological conditions unsuitable for long term archaeological significance, a waiver for this requirement has been requested.

Other agencies have been concerned by the impact on littoral drift and subsequent downdrift erosion. The problem has been

discussed with the Army Corps of Engineers and it has been determined that up to 1000 cubic yards of material may be deposited each year on the west side of the breakwater due to the interruption of the littoral drift.

It is our understanding that present regulations require these deposits to be removed from the west side of the breakwater and be reintroduced to the drift on the east side of the breakwater on a yearly basis. Great care will be taken not to block the mouth of Eightmile Creek in doing this.

Among the agencies concerned about this issue are the U.S. Fish and Wildlife Service and the PA Department of Environmental Resources, Bureau of Water Quality Management. It is probable that other agencies are concerned about this and other issues but as of yet we have not received any comments from these agencies. A full breakdown of the agencies in which we have sent letters to, how they have commented and how we are responding is listed below.

Agency:	Pennsylvania Historical & Museum Commission
Date Received:	April 3, 1989
Comments:	High potential for submerged or above ground prehistorical or historical cultural resources - Phase I Archaeological Survey requested.
Our Response:	Waiver requested

Agency:	PA DER, Bureau of Water Quality Management
Date Received:	March 2, 1989
Comments:	Placement of beach sand should be clean sand fill Land owners to east may experience erosion Need to obtain permits
Our Response:	U.S. Army Corps of Engineers Specification for beach sand included in construction specifications
Date Received:	June 26, 1989
Comments:	Project should have no effect on such resources. See Narrative for description Permits to be obtained

Agency:	U.S. Department of the Interior, Fish & Wildlife Service
Date Received:	February 28, 1989
Comments:	Requested analysis of potential downdrift problem
Our Response:	See Narrative for description

Agency:	U.S. Department of Transportation Federal Highway Administration
Date Received:	February 27, 1989
Comments:	No comment, forwarded to the U.S. Coast Guard

Agency: U.S. Department of Agriculture, SCS
Date Received: February 27, 1989
Comments: Drainage pipe placed previously should be left in place
Our Response: Drainage pipe will be resized to accommodate increased runoff from parking lot and access road

Agency: U.S. Department of Transportation, United States Coast Guard
Comments: No comments received

Agency: PA DER, Coastal Zone Management
Comments: No comments received

Agency: U.S. Environmental Protection Agency, E.I.S. & Wetland Review Section
Comments: No comments received

Agency: U.S. Army Corps of Engineer, District Commander
Date Received: April 11, 1989
Comments: Analysis of proposed plans
Our Response: Adoption of the recommendations
See project plans and specifications

In summary, as a result of our correspondence with these regulatory agencies, we have found that the permits necessary to be obtained prior to construction include but are not limited to:

Soil Erosion & Sedimentation Control Plan, Erie County Conservation District, Corps Permit (Joint Permit Application)

401 Water Quality Certification - PA DER BWQM
Consistency Statement, Coastal Zone Management

Northwest Engineering Inc.

Consultants and Civil Engineers

March 29, 1989

SAMPLE LETTER

U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207

Attention: Mr. Mike Mohr

Subject: Shades Beach Restoration Project
Harborcreek Township, Erie County, PA

Dear Mike:

Enclosed is a set of plans for the subject project as currently designed. These plans were sent to a number of regulatory agencies for review and comment.

Your comments on these plans would be greatly appreciated. If you have any questions or comments regarding the project, please feel free to contact me.

Very truly yours,

NORTHWEST ENGINEERING, INC.

Mark J. Corey/ceb

Mark J. Corey, P.E.

MJC/ceb
Enclosure
cc: Harborcreek Township Supervisors
Harvey H. Stone, P.E.

R.D. 1, P.O. Box Q, Tidioute, Pennsylvania 16351
Telephone (814) 484-3504

LETTER RECIPIENTS

1. Commonwealth of Pennsylvania
   Pennsylvania Historical and Museum Commission
   William Penn Memorial Museum and Archives Building
   P.O. Box 1026]
   Harrisburg PA 17120

2. PA Department of Environmental Resources
   Division of Coastal Zone Management
   P.O. Box 1467
   Harrisburg PA 17120

3. U.S. Department of Transportation
   United States Coast Guard
   1240 East Ninth Street
   Cleveland OH 44199

4. U.S. Department of the Interior
   Fish and Wildlife Service
   315 South Allen Street, Suite 322
   State College PA 16801

5. U.S. Department of Transportation
   Federal Highway Administration
   31 Hopkins Plaza
   Baltimore MD 21201

6. Commonwealth of Pennsylvania
   Pennsylvania Fish Commission
   Lake Erie Research Unit
   P.O. Box 531
   Fairview PA 16415

7. U.S. Department of Agriculture
   Soil Conservation Service
   P.O. Box 985
   Federal Square Station
   Harrisburg PA 17108

8. U.S. Environmental Protection Agency
   EIS and Wetlands Review Section
   Sixth and Walnut Streets
   Philadelphia PA 19106

9. U.S. Army Corps of Engineers
   District Commander, Buffalo District
   1776 Niagara Street
   Buffalo NY 14207

10. PA Department of Environmental Resources
    Bureau of Water Quality Management
    1012 Water Street
    Meadville PA 16335

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION
BUREAU FOR HISTORIC PRESERVATION
BOX 1026
HARRISBURG, PENNSYLVANIA 17108-1026

H
B
R

June 8, 1989

NORTHWEST ENGINEERING INC.
JUN 26 1989

Bruce E. Curfman
Northwest Engineering, Inc.
R.D. #1, Box Q
Tidioute PA 16351

TO EXPEDITE REVIEW
USE BHP REFERENCE NUMBER

Re: ER# 84 1425 049 D
Shade Beach Restoration and
Navigation Improvements
Harborcreek Twp., Erie County

Dear Mr. Curfman:

The above named project has been reviewed by the Bureau for Historic Preservation (the State Historic Preservation Office) in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended in 1980, and the regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation. These requirements include consideration of the project's potential effect upon both historic and archaeological resources.

Based on the supplemental information recently submitted to the Bureau for Historic Preservation concerning the above referenced project, the Bureau has re-evaluated the effect of this activity on cultural resources. Your cooperation in dealing with this matter has been appreciated.

Based on the available information, there are no National Register eligible or listed historic or archaeological properties in the area of this proposed project and therefore, this project should have no effect upon such resources. Should you become aware, from any source, that historic or archaeological properties are located at or near the project site, please telephone the Bureau for Historic Preservation at (717) 783-8946.

Sincerely,

Kurt W. Carr

Kurt W. Carr, Chief
Division of Archaeology
and Protection

KC:vms

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION
BUREAU FOR HISTORIC PRESERVATION
BOX 1026
HARRISBURG, PENNSYLVANIA 17108-1026

March 8, 1989

RECEIVED
APR 03 1989
NORTHWEST ENGINEERING INC.

Marvin L. Ackerly
Harborcreek Township Board of Supervisors
5601 Buffalo Road
Harborcreek, PA 16421-1689

RE: ER# 84 1425 049 C
Shade Beach Restoration and
Navigation Improvements
Harborcreek Twp., Erie Co.

Dear Mr. Ackerly:

The above named project has been reviewed by the Bureau for Historic Preservation (the State Historic Preservation Office) in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended in 1980, and the regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation. These requirements include consideration of the project's potential effect upon both historic and archaeological resources.

J. Lee Cox, Jr. emphasizes the high potential for the Pennsylvania shoreline of Lake Erie to yield submerged cultural resources. Twelve creeks feed into Lake Erie--Eight Mile Creek is one of those. Vessels caught in storms probably sought refuge in the mouths of these creeks; however, the shallowness of the creek mouths would have stranded them. These areas are also areas of high potential for prehistoric archaeological sites.

Based on the information available a wood steamer, the S. K. Martin, sprang a leak and was lost in the vicinity of Harborcreek/Eight Mile Creek on October 12, 1912. This and other submerged cultural resources may exist within your project area. A Phase I archaeological survey is requested to identify any and all on land and submerged prehistoric and historic cultural resources. Enclosed is a selection from J. Lee Cox' Lake Erie survey and guidelines and information for survey.

If you need further information in this matter please consult the Division of Archaeology at (717) 783-8946 or 783-8947.

Sincerely,

Kurt Carr, Chief
Division of Archaeology &
Protection

cc: DER

Enclosures

Northwest Engineering Inc.
Consultants and Civil Engineers

May 1, 1989

Pennsylvania Historical & Museum Commission
William Penn Memorial Museum & Archive Building
Box 1028
Harrisburg, PA 17120

Attention: Kurt Carr, Chief
Division of Archaeology & Protection

Subject: Shades Beach Restoration

Dear Mr. Carr:

I am writing to you in response to your letter dated March 8, 1989 to Mr. Marvin L. Ackerly of Harborcreek Township Board of Supervisors. This matter is in regard to ER #84 1425 049 C, Shades Beach Restoration and Navigation Improvements Project and with a telephone conversation I had with Mr. Jonathan Bream in your Archaeology Lab on April 3, 1989.

In your letter you concluded that a Phase I Archaeological survey was needed to determine if any on-land, or submerged prehistoric or historic cultural resources existed on the site and, if so, to identify them. However, in discussing the project site conditions with Mr. Bream it became apparent that this may not be necessary and we are requesting that this requirement be waived on the grounds of the following:

The entire project area has been disturbed in the past by a very popular beach and boat livery. In addition to this, erosion has cut approximately 50 feet from the shore in this area since a survey was taken in 1930 (see Exhibit 1). Any prehistoric artifacts that may have existed at the site would probably have been disturbed or washed away. Subsequent storms have deposited cobbles and rubble on the beach and destroyed a masonry structure used with an abandoned boat launch facility.

In taking elevations for our topographical survey on a 50 foot grid, the bottom of the lake was described as being solid, bedrock type, shale. The existence of the S.K. Martin at this site is improbable due to the fact that wave action would have washed it out to deeper water (see Exhibit II).

R.D. 1, P.O. Box Q, Tidioute, Pennsylvania 16351
Telephone (814) 484-3504

If the S.K. Martin did, in fact, seek refuge in Eightmile Creek, it is doubtful that it could have entered the watercourse because the creek is not big enough to float a boat of any real size even in its springtime torrents. Also, there is a small (2' high) waterfall at the base of the rock bluff. The bottom of the creek is composed of the same solid, bedrock type, shale that exists on the bottom of the lake. Furthermore, the proposed project does not extend over to Eightmile Creek and, in fact, is not on this parcel of ground (see Exhibit I).

In consideration of these facts, we feel that our project will not affect any undisturbed on-land or submerged prehistoric or historic cultural resources and would like the requirement of a Phase I Archaeological survey to be waived. If you need any additional information or have any questions, please feel free to contact me.

Very truly yours,

NORTHWEST ENGINEERING, INC.

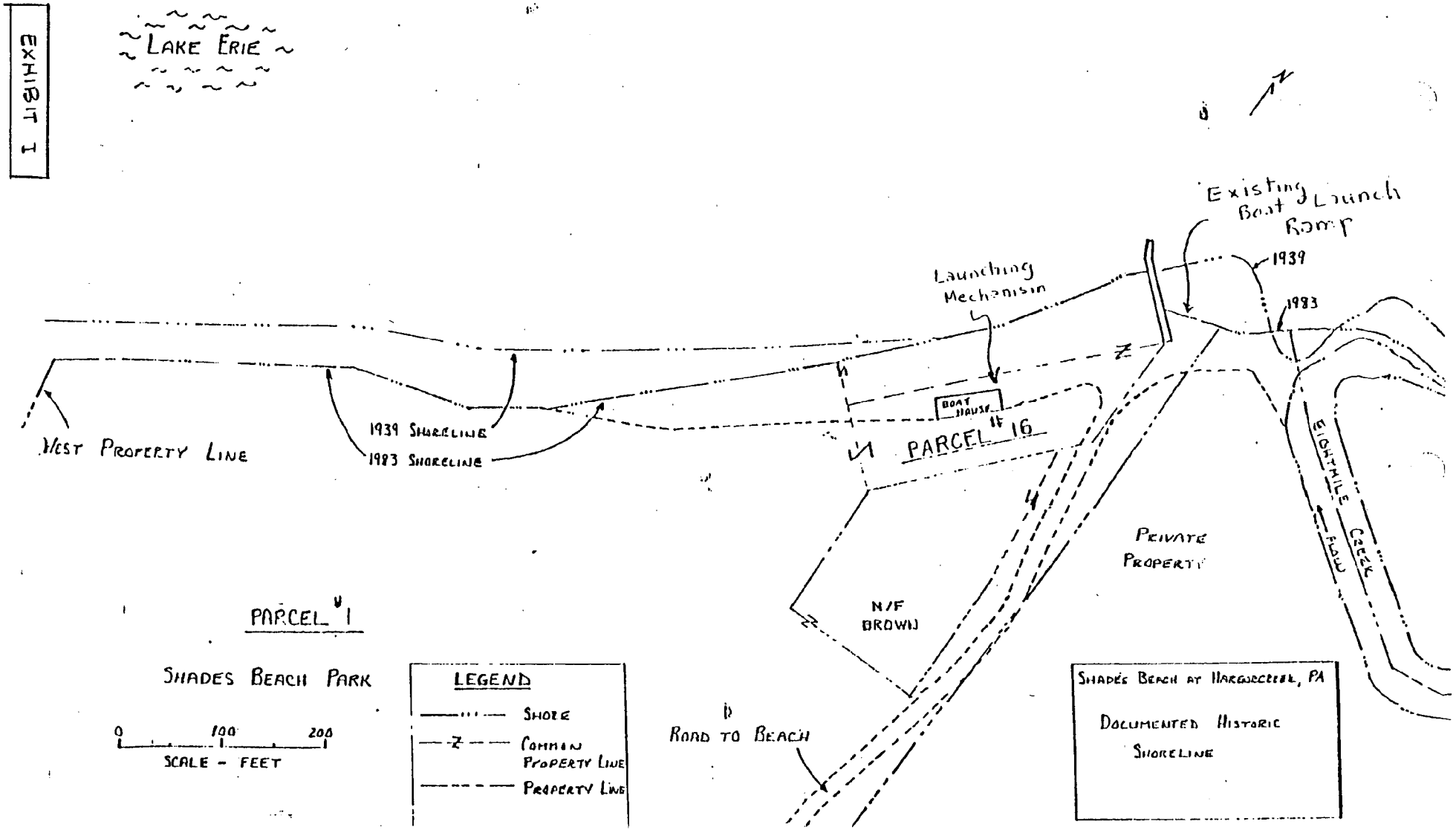
Bruce E Curfman

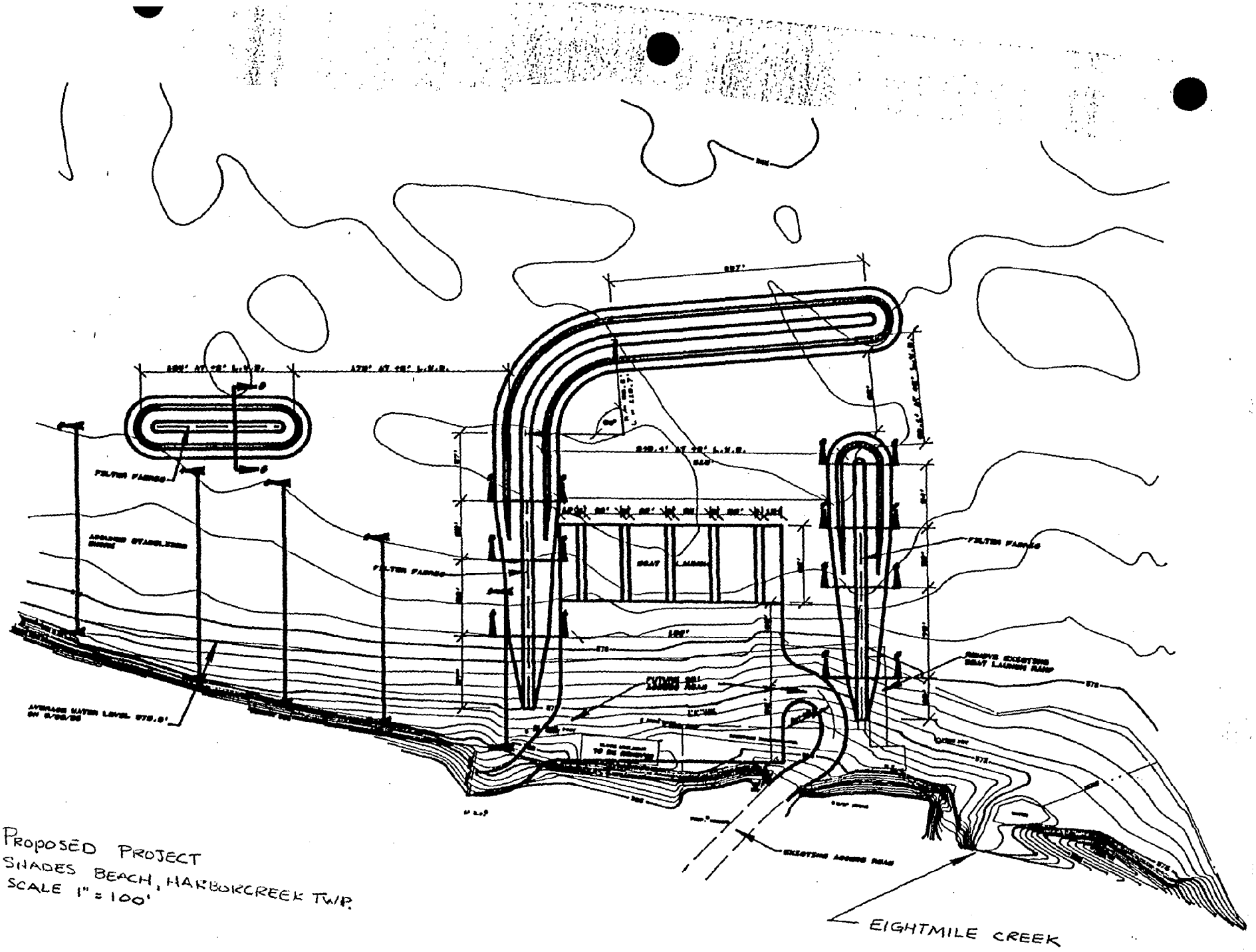
Bruce E. Curfman

BEC/ceb
cc: Harborcreek Township/Marvin Ackerly
Harvey H. Stone, P.E.
Mark J. Corey, P.E.
James Murphy, P.E.

PLATE 5

EXHIBIT 1





PROPOSED PROJECT
SHADES BEACH, HARBORCREEK TWP.
SCALE 1" = 100'

Harborcreek Township Supervisors

JAMES W. SONNEY
MARVIN L. AKERLY
DONNA L. MINDEK

ELEANOR H. MUSGRAVE
SECRETARY AND TREASURER
PHONE 814/899-3171

February 15, 1989

RECEIVED
FEB 24 1989
NORTHWEST ENGINEERING INC.

PA Dept of Environmental Resources
Bureau of Water Quality Mgmt
1012 Water Street
Meadville, PA 16335

Subject: Shades Beach Restoration and Navigation Improvements
Design Study - Harborcreek Township, Erie County, PA

Gentlemen:

Harborcreek Township is currently in the process of completing a design study for the subject project to be located in the Township adjacent to Lake Erie. Enclosed is a location map showing the proposed site on the Harborcreek, Pennsylvania U.S.G.S. quadrangle map.

The Buffalo District of the United States Army Corps of Engineers completed an initial appraisal report for the Shades Beach restoration project in 1985. As part of that work effort, records show that your office was contacted during the course of the initial study sometime in 1984. At that time, the Corps of Engineers was seeking preliminary comments regarding the project.

Enclosed are conceptual plans of the breakwaters and boat launching facilities as presently being considered. We are hereby inviting your review and comments on the project prior to the development of final construction plans and specifications.

Please address all correspondence on this project to:

Northwest Engineering, Inc.
5 West 10th Street, Suite 304
Erie, PA 16501
Attn: Mark J. Corey, P.E.
(814) 456-0311

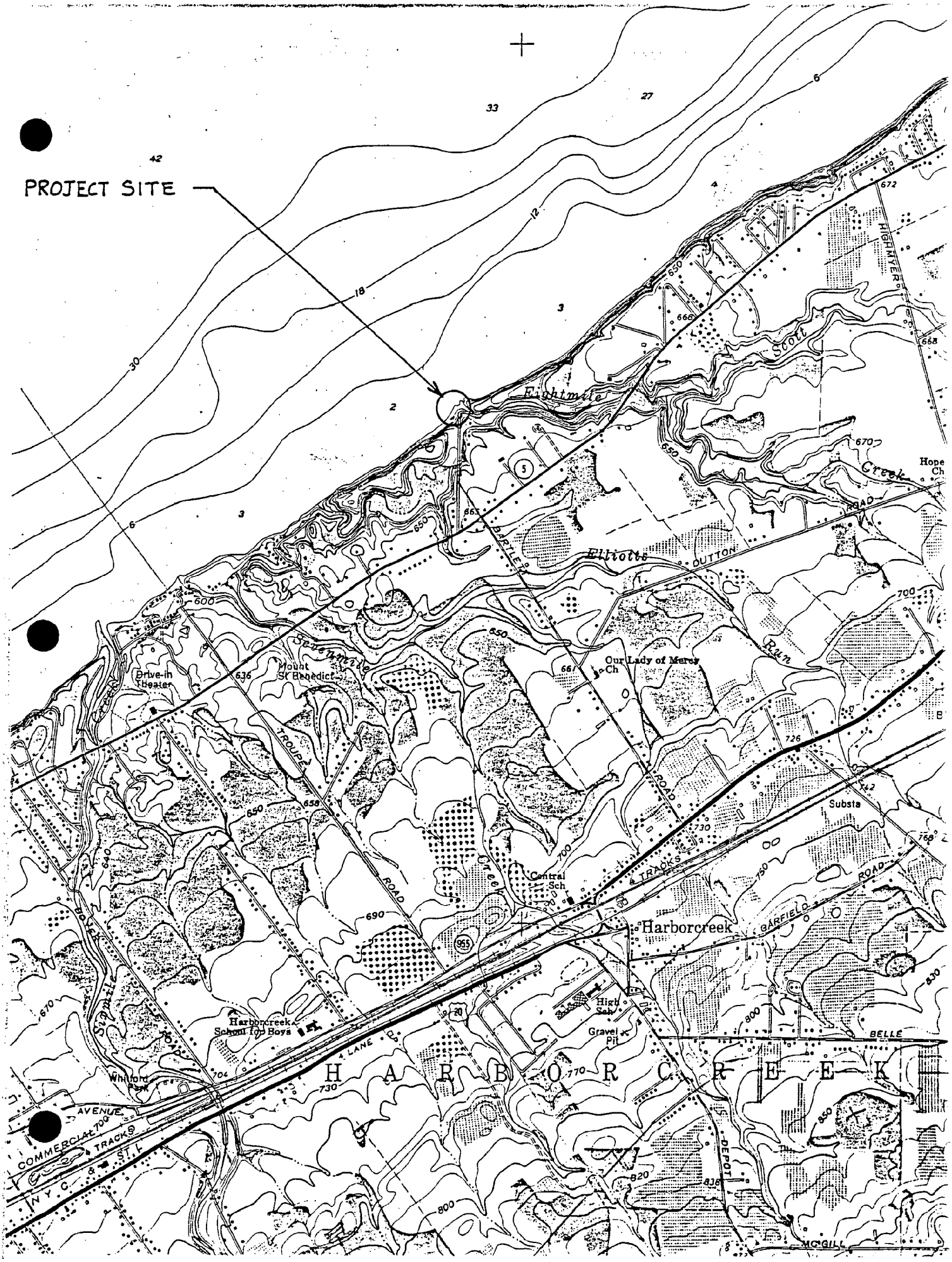
Your input with regard to this project would be greatly appreciated. Our next meeting with the Erie County Dept. of Planning is scheduled for March 2, thus your response would be appreciated as soon as possible. If you should have any questions, or if additional information is required, please do not hesitate to contact Mark Corey or one of the Supervisors.

Very truly yours,

Marvin L. Akerly, Chairman
BOARD OF SUPERVISORS
HARBORCREEK TOWNSHIP
/em

5601 BUFFALO ROAD HARBORCREEK, PENNSYLVANIA 16421-1698

cc:
NW Engr.


PROJECT SITE
Eightmile
Scott
Creek
Elliotts
Run
Sevenmile
Drive-in Theater
Mount St Benedict
Our Lady of Mercy Ch
Central Sch
Harborcreek
Harborcreek School for Boys
High Sch
Gravel Pit
Whitford Park
Substa
HARBORCREEK
HIGHMYER
BARTLETT
DUTTON
ROAD
TROUPE
TRACKS
GARFIELD
BELLE
DEPOT
McGILL
COMMERCIAL
AVENUE
N Y C & ST L
LANE
Hope Ch

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
1012 Water Street
Meadville, Pennsylvania 16335
Telephone: A. C. 814/724-8550

RECEIVED
MAR 0 2 1989
NORTHWEST ENGINEERING INC.

March 1, 1989

Subject: Shades Beach Restoration & Navigation Improvements
Design Study-Harborcreek Township, Erie County, Pennsylvania

Mr. Marvin L. Akerly, Chairman
Harborcreek Township Supervisors
5601 Buffalo Road
Harborcreek, PA 16421-1698

Dear Mr. Akerly:

This letter is being written in response to your request for input with regard to the above proposed project. In 1984, we mentioned that any placement of sand should be clean sand fill and of our concern over landowners to the east which may experience beach erosion. We have no other comments at this time regarding the plans.

Several permits/approvals may be necessary to authorize your project, including, but not limited to, the following:

1. Joint permitting by the Bureau of Dams and Waterway Management (BDWM) and the Corps of Engineers.

2. 401 Water Quality Certification from the BDWM.

If you have any questions, please feel free to contact me.

Sincerely,

Michael Zimmerman

Michael K. Zimmerman
Planning Engineer
Bureau of Water Quality Management

MKZ/jb

cc: Mark J. Corey, PE

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Suite 322
315 South Allen Street
State College, Pennsylvania 16801

RECEIVED
FEB 28 1989
NORTHWEST ENGINEERING INC.

February 27, 1989

Mr. Marvin L. Akerly, Chairman
Board of Supervisors -
Harborcreek Township
5601 Buffalo Road
Harborcreek, PA 16421

Dear Mr. Akerly:

The U.S. Fish and Wildlife Service has reviewed the conceptual plans submitted with your letter of February 15, 1989, for the Shades Beach Restoration and Navigation Improvements Project, Harborcreek Township, Erie County.

Our only concern with the plans at this stage is the impact of interrupting the littoral drift that will be caused by breakwaters. We concur with the need for this project and have no serious objection to its construction. We would like to see the potential down-drift erosion problem evaluated as project plans progress.

A copy of this letter is being provided to Northwest Engineering.

Sincerely,

Charles J. Kulp
Supervisor

cc:
PFC - Carter
PGC - Sitlinger
DER - Smith, Thompson
COE - Buffalo
EPA - Kline
ARD - FWE
Readers file
Project file
ES:SCFO:DPutnam:fae:2/24/89
Mark Corey
Northwest Engineering, Inc
5 West 10th Street, Suite 304
Erie PA 16501

Northwest Engineering Inc.

Consultants and Civil Engineers

May 30, 1989

U.S. Department of the Interior
Fish & Wildlife Service
Suite 322
315 South Allen Street
State College, PA 16801

Attention: Charles J. Kulp

Subject: Shades Beach Restoration
Harborcreek Township, Erie County

Dear Mr. Kulp:

I am responding to your letter dated February 27, 1989 to Mr. Marvin L. Akerly of the Harborcreek Township Supervisors.

In your letter you requested an analysis of the potential down-drift erosion problem as the project plans progress. The problem has been discussed with the U.S. Army Corps of Engineers and it has been determined that up to 1000 cubic yards of material may be deposited each year on the west side of the breakwater due to the interruption of the littoral drift.

It is our understanding that present regulations require these deposits be removed from the west side of the breakwater and be replaced into Lake Erie on the east side of the breakwater on a yearly basis by the owner. Great care will be taken not to block the mouth of Eightmile Creek in doing this.

If you have any comments or questions concerning this matter or others, please don't hesitate to contact us.

Very truly yours,

NORTHWEST ENGINEERING, INC.

Bruce E. Curfman

Bruce E. Curfman

BEC/ceb
cc: Harborcreek Township
Mark J. Corey, P.E.
Harvey H. Stone, P.E.
James E. Murphy, P.E.

R.D. 1, P.O. Box Q, Tidioute, Pennsylvania 16351
Telephone (814) 484-3504

U.S. Department
of Transportation
**Federal Highway
Administration**

Region 3
Pennsylvania Division

Courthouse and Federal Building
228 Walnut Street
P.O. Box 1086
Harrisburg, Pennsylvania
17108-1086

IN REPLY REFER TO:

MAR 1 1989

FEB 27 1989

Erie County, Pennsylvania
Harborcreek Township,
Shades Beach Restoration and
Navigation Improvements

Mr. Marvin L. Akerly, Chairman
Board of Supervisors
Harborcreek Township
5601 Buffalo Road
Harborcreek, Pennsylvania 16421-1698

Dear Mr. Arkerly:

Your February 15, 1989 letter regarding the subject project, addressed to our Regional Office in Baltimore was referred to this office for review. We have no comment on the proposed action.

We are forwarding your letter to our sister modal agency in the U. S. Department of Transportation, the 9th District Coast Guard Office in Cleveland, Ohio, for their comment.

Thank you for affording us the opportunity to comment on your proposal.

Sincerely yours,

George Y. Hammond

for Manuel A. Marks
Division Administrator

cc: Commander (M)
9th Coast Guard District
1240 East 9th Street
Cleveland, Ohio 44199

cc MARK
cc file

UNITED STATES
DEPARTMENT OF
AGRICULTURE

SOIL
CONSERVATION
SERVICE

R. D. 3, BOX 261
CLARION, PA 16214
(814) 226-6116

February 27, 1989

RECEIVED
FEB 28 1989
NORTHWEST ENGINEERING INC.

Northwest Engineering, Inc.
5 West 10th Street, Suite 304
Erie, Pennsylvania 16501

ATTN: Mark J. Corey, P.E.

Dear Mr. Corey:

We constructed a land drainage project in this area some years ago. It appears that the concrete pipe shown on the plans is the outlet for this system. This pipe should remain open.

Sincerely,

PHILIP R. MCLOUD
Area Engineer

U.S. Army Corps of Engineers

MC
HS
JM
RF

April 11, 1989

Mr. Mark J. Corey, P.E.
Northwest Engineering Inc.
R.D. 1
P.O. Box Q
Tidioute, PA 16351

Dear Mr. Corey:

Thank you for the opportunity to personally comment on the proposed Shades Beach Restoration Project. Although I have only made a very preliminary review of your work, I am enclosing some suggestions that you may want to consider (Encl. 1).

As the Corps is only authorized and funded to review specific Architect-Engineering designs, your plans and my comments were not reviewed by the Corps Engineering personnel.

Sincerely,

Michael Mohr

MICHAEL MOHR
Coastal Engineer

Enclosure

RECEIVED
APR 14 1989
NORTHWEST ENGINEERING INC.

COMMENTS ON SHADES BEACH RESTORATION PROJECT
BY MICHAEL MOHR, P.E.

SHEET 1

1. Suggest establishing a baseline with breakwater locations and orientation indicated by station and offset or state plane coordinates.

2. Suggest increasing length of filter in West Breakwater to around the "bend".

3. Filter fabric in offshore breakwater appears unnecessary.

4. Show initial beach fill placement

SHEET 2

1. Suggest showing filter fabric through sections.

2. Based upon our Initial Appraisal Report (IAR) (1984), Plan C, recommended increasing crest height of West Breakwater to at least +8' LWD and Offshore Breakwater to +7.5' LWD. Wave transmission through the breakwaters was not considered during the IAR. Stone sizes and layers should be defined on all sections.

3. Suggest showing toe stone slope at 1V:1H.

4. Suggest showing outline of existing groin in Section D-D.

5. If comment 2, sheet 2 is adopted a section for the offshore breakwater will be required.

6. Since there is an existing small beach, the required excavation at the shoreward end of the breakwaters to rock (shale) should be shown.

SHEET 3

1. Are the boat launch/parking to be constructed under a future contract? If so these features should be clearly defined.

SHEET 4

1. It is difficult to build beach (underwater portion) as shown. Usually you build it as a level berm with a natural angle of repose and allow waves to shape the beach or shape sand slope above waterline only (more expensive).

2. Sand gradation/quantity in specs?

The designers should also be aware that the design as proposed is a "fair weather" launch facility and will not provide complete protection especially during NE storm events. Alterations to the outer breakwater such as increasing its length will help improve wave conditions inside the facility if it is desired.

3/27/89

Shades Beach - Agency Correspondence

Date	Agency	Comments
3/27/89	PA Historical Museum Comm. (717) 783-6099 Joanne [illegible]	Joanne hasn't seen; will get back to me
[illegible] 3/27 [illegible]	U.S. Coast Guard (216) 522-3991 Mr. Culver	
Fairview 3/27/89	PA Fish Commission 474-1514 Roger Kenyon	No problems; no impact on spawning habitats. No endangered species.
[illegible]	U.S. EPA (215) 597-9300	will [illegible]
	U.S. Army Corps of Engineers (716) 876-5454 X2230 Mike Mohr	send set directly to Mike Mohr

AGENCY	PRELIMINARY COMMENTS
PA Historical and Museum Commission	High probability of archaeological resources
PaDER Coastal Zone Management (received at mtg. with Scott Sykes)	"Geographical Area of Particular Concern"
U.S. Coast Guard	Navigation aid, beacons required
U.S. Fish and Wildlife Service	**impact on littoral drift and potential down-drift erosion
Federal Highway Administration	**No comments
PA Fish Commission	Impact on Eightmile Creek
U.S.D.A. Soil Conservation Service	Drainage pipe near future access road to remain undisturbed
U.S. Environmental Protection Agency	No comments
U.S. Army Corps of Engineers	Economically feasible
PaDER Water Quality Management	Potential down drift shore erosion

* Preliminary comments are from 1984 correspondence between agency and U.S. Army Corps of Engineers unless otherwise noted with "**", in which case, updated comments have been received in 1989.

SECTION 103-107
INITIAL APPRAISAL REPRORT
HARBORCREEK, PA

APPENDIX A

CORRESPONDENCE

OEC. MGMT. OAS
15 Nov 83 09 39

Harborcreek Township Supervisors

GERALD R. BLANCHFIELD
JAMES W. SONNEY
MARVIN L. AKERLY

ELEANOR H. MUSGRAVE
SECRETARY AND TREASURER
PHONE 814/899-3171

November 9, 1983

U.S. Army Engineering District, Buffalo
1776 Niagara Street
Buffalo, NY 14207

Attention: District Engineer

Dear Sir;

Harborcreek Township, located in Erie County, Pennsylvania, is considering the construction of improvements at a Township Park which will be located in the waters of Lake Erie. The Park is Shades Beach Park which is located near the mouth of Eight Mile Creek and north of the intersection of Bartlett Road and East Lake Road (US Route 5). The improvements under consideration consist of groins and/or breakwaters.

We hereby request and would greatly appreciate any assisstance which you could provide us related to this project. Perhaps a visit by someone from your staff to review the site and our preliminary plans could be arranged.

Your anticipated help is appreciated.

Sincerely yours,

HARBORCREEK TOWNSHIP SUPERVISORS

Marvin L. Akerly, Supervisor
THE BOARD OF SUPERVISORS

MLA/mld

cc: Northwest Engineering

Harborcreek Township Supervisors

GERALD R. BLANCHFIELD
JAMES W. SONNEY
MARVIN L. AKERLY

ELEANOR H. MUSGRAVE
SECRETARY AND TREASURER
PHONE 814/899-3171

April 26, 1984

Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Subject: Initiation of an Initial Appraisal of the Beach Erosion and Navigation Needs in Harborcreek, PA

Gentlemen:

Enclosed please find our completed pre-application as per your letter of April 13, 1984. I trust this is the information required, and if you should have additional questions please do not hesitate to contact me.

Very truly yours,

HARBORCREEK TOWNSHIP SUPERVISORS

Marvin L. Akerly

Marvin L. Akerly, Chairman
THE BOARD OF SUPERVISORS

MLA/em

Enc:

5601 BUFFALO ROAD HARBORCREEK, PENNSYLVANIA 16421-1698

4/12/8

OFC. MGMT. OAS

13 APR 84 14 16 [illegible]

13 APR 1984

NCBPD-S

SUBJECT: Initiation of an Initial Appraisal of the Beach Erosion and Navigation Needs in Harborcreek, PA

Mr. Marvin Ackerly
Supervisor
Harborcreek Township Supervisors
5601 Buffalo Road
Harborcreek, PA 16421-1698

Dear Mr. Ackerly:

I have initiated an Initial Appraisal so that I can determine if further Federal study of the beach erosion and navigation problems in Harborcreek is warranted.

The Corps of Engineers has authority to restore historic shorelines under Section 103 of the 1962 River and Harbor and Flood Control Act, as amended. The authority to assist communities in navigation improvements was granted to the Corps by Section 107 of the 1960 River and Harbor and Flood Control Act, as amended. Under both authorities, all work must be environmentally sound, economically justified, and engineeringly feasible.

The expected completion date for both studies is 30 September 1984. Enclosed you will find two partially completed Federal Assistance Preapplications (SF 424's). Please fill in all missing information in blocks 2 through 22 and sign the certificate in block 23. Detailed instructions are provided on the second page of the form. Return the completed preapplications to me as soon as possible.

Correspondence pertaining to the matter should be addressed to the District Commander, U.S. Army Engineer District, Buffalo, 1776 Niagara Street, Buffalo, NY, 14207, ATTN: Mr. William Werick. If you have any questions or

FEDERAL ASSISTANCE

1. TYPE OF ACTION (Mark appropriate box)
- [X] PREAPPLICATION
- [ ] APPLICATION
- [ ] NOTIFICATION OF INTENT (Opt.)
- [ ] REPORT OF FEDERAL ACTION

2. APPLICANT'S APPLICATION — a. NUMBER: ; b. DATE (Year month day): 1984 4-26

3. STATE APPLICATION IDENTIFIER — a. NUMBER: ; b. DATE ASSIGNED (Year month): 19

Leave Blank

SECTION I—APPLICANT/RECIPIENT DATA

4. LEGAL APPLICANT/RECIPIENT

a. Applicant Name : Harborcreek Township
b. Organization Unit : 5601 Buffalo Road
c. Street/P.O. Box : Harborcreek, PA
d. City :
e. County : Erie
f. State :
g. ZIP Code: 16421-1698
h. Contact Person (Name & telephone No.) :

5. FEDERAL EMPLOYER IDENTIFICATION NO. 25-6001664 182200

6. PROGRAM (From Federal Catalog) — a. NUMBER: 11.01 ; b. TITLE: Small Navigation Improvements (107

7. TITLE AND DESCRIPTION OF APPLICANT'S PROJECT

Small Navigation Improvements Near Shade's Park (Lake Erie)

8. TYPE OF APPLICANT/RECIPIENT
A-State; B-Interstate; C-Substate District; D-County; E-City; F-School District; G-Special Purpose District; H-Community Action Agency; I-Higher Educational Institution; J-Indian Tribe; K-Other (Specify): Town
Enter appropriate lett.

9. TYPE OF ASSISTANCE
A-Basic Grant; B-Supplemental Grant; C-Loan; D-Insurance; E-Other
Enter appropriate letter(s)

10. AREA OF PROJECT IMPACT (Names of cities, counties, States, etc.): Harborcreek Township, Erie County Pennsylvania

11. ESTIMATED NUMBER OF PERSONS BENEFITING

12. TYPE OF APPLICATION
A-New; B-Renewal; C-Revision; D-Continuation; E-Augmentation
Enter appropriate lett

13. PROPOSED FUNDING

a. FEDERAL	$ 3,750 .00
b. APPLICANT	0 .00
c. STATE	0 .00
d. LOCAL	0 .00
e. OTHER	0 .00
f. TOTAL	$ 3,750 .00

14. CONGRESSIONAL DISTRICTS OF:
a. APPLICANT: PA 21
b. PROJECT: PA 21

15. TYPE OF CHANGE (For 11c or 11e)
A-Increase Dollars; B-Decrease Dollars; C-Increase Duration; D-Decrease Duration; E-Cancellation; F-Other (Specify): N/A
Enter appropriate letter(s)

16. PROJECT START DATE (Year month day): 19

17. PROJECT DURATION (Months)

18. ESTIMATED DATE TO BE SUBMITTED TO FEDERAL AGENCY (Year month day): 19

19. EXISTING FEDERAL IDENTIFICATION NUMBER: n/a

20. FEDERAL AGENCY TO RECEIVE REQUEST (Name, City, State, ZIP code): U.S. Army Engineer District, Buffalo Buffalo, NY 14207

21. REMARKS ADDED [ ] Yes [ ] No

SECTION II—CERTIFICATION

22. THE APPLICANT CERTIFIES THAT ▶

a. To the best of my knowledge and belief, data in this preapplication/application are true and correct, the document has been duly authorized by the governing body of the applicant and the applicant will comply with the attached assurances if the assistance is approved.

b. If required by OMB Circular A-95 this application was submitted, pursuant to instructions therein, to appropriate clearinghouses and all responses are attached: (No response / Re at:)
(1) [ ]
(2) [ ]
(3) [ ]

23. CERTIFYING REPRESENTATIVE
a. TYPED NAME AND TITLE: Marvin L. Akerly, Chairman BOARD OF SUPERVISORS
b. SIGNATURE: Marvin L. Akerly
c. DATE SIGNED (Year month): 1984 04

SECTION III—FEDERAL AGENCY ACTION

24. AGENCY NAME

25. APPLICATION RECEIVED (Year month): 19

26. ORGANIZATIONAL UNIT

27. ADMINISTRATIVE OFFICE

28. FEDERAL APPLICATIC IDENTIFICATION

29. ADDRESS

30. FEDERAL GRANT IDENTIFICATION

31. ACTION TAKEN
- [ ] a. AWARDED
- [ ] b. REJECTED
- [ ] c. RETURNED FOR AMENDMENT
- [ ] d. DEFERRED
- [ ] e. WITHDRAWN

32. FUNDING

a. FEDERAL	$ .00
b. APPLICANT	.00
c. STATE	.00
d. LOCAL	.00
e. OTHER	.00
f. TOTAL	$ .00

33. ACTION DATE ▶ (Year month day): 19

34. STARTING DATE (Year month): 19

35. CONTACT FOR ADDITIONAL INFORMATION (Name and telephone number)

36. ENDING DATE (Year month): 19

37. REMARKS ADDED [ ] Yes [ ] No

38. FEDERAL AGENCY A-95 ACTION

a. In taking above action, any comments received from clearinghouses were considered. If agency response is due under provisions of Part 1, OMB Circular A-95, it has been or is being made.

b. FEDERAL AGENCY A-95 OFFICIAL (Name and telephone no.)

OPC. MGMT. OAS

14 FEB 84 10 21

Harborcreek Township Supervisors

GERALD R. BLANCHFIELD
JAMES W. SONNEY
MARVIN L. AKERLY

ELEANOR H. MUSGRAVE
SECRETARY AND TREASURER
PHONE 814/899-3171

February 13, 1984

Col. Robert R. Hardiman
U. S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, New York 14207

Subject: Shades Beach
Harborcreek Township
Erie County, Pennsylvania

Dear Sir:

On January 11, 1984, Mr. Bill Werick and Mr. Denton Clark from your office met with representatives of Harborcreek Township to discuss proposed imporvements at Shades Beach Township Park. The impovements under consideration would result in both beach replenishment as well as navigational improvements which would benefit users of the park.

As a result of our meeting, we hereby request an "Initial Appraisal" report be performed on the proposed improvements as discussed with Mr. Werick and Mr. Clark. If we can be of any assistance during the preparation of the report, feel free to contact myself at Harborcreek Township, phone 814-899-3171.

Thank you for your assistance in our endeavors to improve the recreational facilities at Shades Beach.

Sincerely yours,

HARBORCREEK TOWNSHIP SUPERVISORS

Marvin L. Akerly

Marvin L. Akerly, Chairman
THE BOARD OF SUPERVISORS

MLA/em

5601 BUFFALO ROAD HARBORCREEK, PENNSYLVANIA 16421-1698

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Suite 322
315 South Allen Street
State College, Pennsylvania 16801

OFC. MGMT. OAS
2 AUG 84 11 37

July 30, 1984

Colonel Robert R. Hardiman
District Commander, Buffalo District
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207

Dear Colonel Hardiman:

This refers to your letter of July 5 requesting information and comments on a proposed small-boat harbor and beach restoration project at Shades Beach Park, Harborcreek Township, Erie County, Pennsylvania. This response is part of the scoping process required under the National Environmental Policy Act of 1969.

We have a number of concerns which should be addressed as the NEPA process continues. These concerns should be addressed in the forthcoming environmental impact statements:

1. the affects of interruption of littoral drift on fish habitat.

2. possible impacts to Eight Mile Run such as accretion of sand or loss of shoreline (depending on drift direction).

3. maintenance dredging required to keep the harbor entrance open and possible fish entrapment if the opening became closed.

4. the time of year maintenance dredging would be required and disposal of dredged spoils.

5. fishing access to the breakwaters.

Eight Mile Creek is classified by the Pennsylvania Department of Environmental Resources as a Cold Water Fishery. The stream supports a variety of fish species and is possibly used by salmonids such as salmon and steelhead trout. It has also been reported that log perch use the stream in the spring.

Except for occasional transient species, no federally listed or proposed threatened or endangered species under our jurisdiction are known to exist in the project impact area. Therefore, no Biological Assessment or further Section 7 consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) is required with the Service. Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered. A compilation of federally listed endangered and threatened species in Pennsylvania is attached for our information.

We know of no critical or unique habitats within the proposed project area. The blue pike (Stizostetion vitreum glaucum) and the longjaw cisco (Corregonus alpenae) have historically been found in Lake Erie; however, these two fish are now probably extinct.

We suggest that you contact the Pennsylvania Game Commission and the Pennsylvania Fish Commission to determine if any species recognized as threatened or endangered by the Commonwealth of Pennsylvania would be impacted by the project.

The Service is willing to participate in this study and appreciates the opportunity to comment on the proposed project. Please kee us advised of further developments.

Sincerely,

Charles J. Kulp
Field Supervisor

Enclosure

FEDERALLY LISTED ENDANGERED AND THREATENED
SPECIES IN PENNSYLVANIA

Common Name	Scientific Name	Status	Distribution
FISHES:			
Cisco, longjaw	Coregonus alpenae	E	Lake Erie - probably extinct
Pike, blue	Stizostedion vitreum glaucum	E	Deep water of Lake Erie - probably extinc
Sturgeon, shortnose*	Acipenser brevirostrum	E	Delaware River & other Atlantic coastal river
REPTILES:			
None			
BIRDS:			
Eagle, bald	Haliaeetus leucocephalus	E	Entire State - nests only in Crawford Count
Falcon, American peregrine	Falco peregrinus anatum	E	Entire State - re-establishment to former breeding range in progress
Falcon, Arctic peregrine	Falco peregrinus tundrius	E	Entire State migratory - no nesting
Warbler, Kirtland's	Dendroica kirtlandii	E	Western Pennsylvania - occasional migrant
MAMMALS:			
Bat, Indiana	Myotis sodalis	E	Entire State - only known wintering population in PA is in Blair County
Cougar, eastern	Felis concolor cougar	E	Entire State - probably extinct
Fox squirrel, Delmarva	Sciurus niger cinereus	E	Southeastern PA - probably extirpated

Federally listed endangered and threatened species in Pennsylvania (continued)

MOLLUSKS:

Pearly mussel, orange footed	Plethobasus cooperianus**	E	Ohio River drainage - no recent collections
Pearly mussel, pink mucket	Lampsilis orbiculata**	E	Ohio River drainage - no recent collections
Pigtoe, rough	Pleurobema plenum	E	Ohio River drainage - no recent collections

PLANTS:

Small whorled pogonia	Isotria medeoloides	E	Entire State - historic populations in Berks, Chester, Green, Monroe, Montgomery & Philadelph Counties Existing population in Centre County

*Principal responsibility for this species is vested with the National Marine Fisheries Service.

**Since listing, Plethobasus cooperianus has been renamed Plethobasus striatus and Lampsilis orbiculata has been renamed Lampsilis abrupta.

Fish & Wildlife Service, Region 5
March 1983

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

REGION THREE
31 Hopkins Plaza
Baltimore, Maryland 21201

July 30, 1984

IN REPLY REFER TO:
HPP-03.6

District Commander
U.S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, New York 14207

ATTN: Mr. Philip Berkeley

Dear Sir:

In response to your July 2, 1984 letter, the Federal Highway Administration is not aware of any project planning or studies in the area that could be affected by the proposed improvements to Shades Beach Park.

Land use planning is a local agency responsibility and the most current data is available from Erie County. Also, the Pennsylvania Department of Transportation (Penn DOT) has advised us that they have no highway improvements under study in the vicinity of the park. However, East Lake Road, PA-5, is under Penn DOT's jurisdiction and any plans to modify or change access should be coordinated with:

Mr. Lewis M. Gurley, PE
Pennsylvania Department of
Transportation, District 1D
1140 Liberty Street
Franklin, Pennsylvania 16323

Telephone: (814) 437-4300

Sincerely yours,

Vincent Ciletti

Vincent Ciletti
Director, Office of Planning
and Program Development

OFC. MGMT. OAS
2 AUG 84 11 35

TELEPHONE OR VERBAL CONVERSATION RECORD

For use of this form, see AR 340-15; the proponent agency is The Adjutant General's Office.

DATE: 27 July 1984

SUBJECT OF CONVERSATION

Harborcreek, Shades Beach Park, PA - Section 103 and 107 Study

INCOMING CALL

PERSON CALLING	ADDRESS	PHONE NUMBER AND EXTENSION
Mike Zimmerman	PA DER - Meadville, PA	
PERSON CALLED	**OFFICE**	**PHONE NUMBER AND EXTENSION**
Phil Berkeley	NCBPD-ER	FTS 473-2171

OUTGOING CALL

PERSON CALLING	OFFICE	PHONE NUMBER AND EXTENSION
PERSON CALLED	**ADDRESS**	**PHONE NUMBER AND EXTENSION**

SUMMARY OF CONVERSATION

1. Mike called in response to our 2 July 1984 letter to Peter A. Yeager, Chief of the Planning Section, Bureau of Water Quality Management, Pennsylvania Department of Environmental Resources, concerning the Shades Beach Park Study.

2. He indicated the following concerns about a possible project at the Park.

- If plan 3 is selected we should use clean beach sand.

- He was somewhat conerned about downdrift shore erosion to the east of the project. I told him that we consider this in our planning and coastal studies and would take measures (e.g. nourishment of downdrift areas), to correct any potential problems if they might occur.

3. Mike indicated that his office did not have any other concerns and would not send us a written reply to the 2 July 1984 letter.

Harborcreek Township Supervisors

GERALD R. BLANCHFIELD
JAMES W. SONNEY
MARVIN L. AKERLY

ELEANOR H. MUSGRAVE
SECRETARY AND TREASURER
PHONE 814/899-3171

July 24, 1984

Patricia Lubender
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Ms. Lubender:

I am sorry I will be out of town when you call today, however I have some information for you regarding the size of the land we spoke of near the proposed project site.

The land north of East Lake Road is 40 acres ±, this includes the picnic area as well as the beachfront. The land south of East Lake Road contains 297 acres ±, a great deal of it in virgin wooded acerage.

The following items are left for your information:

Flood Insurance Study
Flood Plain Ordinance No. 84
Bluff Set Back Ordinance No. 81-89
Zoning Ordinance No. 41
Harborcreek Township Comprehensive Plan

These items are information re: Army Corps of Engineers letter of July 2, 1984 from Colonel Hardiman. After you have the opportunity to study these, I would appreciate their return. Thank you.

Very truly yours,

Fred Mc Clurg, Parks Director

5601 BUFFALO ROAD HARBORCREEK, PENNSYLVANIA 16421-1698

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA FISH COMMISSION
Lake Erie Research Unit
Box 531
Fairview, Penna. 16415

July 23, 1984

Mr. Philip Berkeley
District Commander
U.S. Army Engineer District
1776 Niagara St.
Buffalo, NY 14207

Dear Mr. Berkeley:

RE: Harborcreek PA Beach Restoration and Small Navigation Study-Fish and Wildlife Resources

Regarding the above, I have some concern for the proximity of the down-lake entrance and extension of both breakwalls to the mouth of Eight-Mile Creek. The flow of this tributary is generally insufficient to maintain an open and clear channel at its mouth at Lake Erie. There is usually a sizable gravel barrier bar across the mouth and I am wondering about the fate of this bar if the proposed construction is undertaken. If too close to the mouth, additional material could be deposited on the barrier bar due to wave action from the east. This would proclude anadromous movement of fishes. If too far from the mouth, the bar could be destroyed permanently and I suspect further erosion of the high clay banks down lake of the structure would be inevitable.

Eight-Mile Creek sustains intermittent runs or ascensions of steelhead and coho salmon during seasonal periods of high water and stream discharge - usually in late Fall, Winter and early Spring. These "runs" are not spectacular or frequent although a mid-winter steelhead fishery at the mouth is known to be popular by a few sportfishermen.

The creek rarely has a flow greater than 2 cubic feet per second during the dry season, June through October, and the 85% bedrock bottom and lack of deep pools supports little fish life except for a few small trout, cyprinids some suckers and other small fishes such as darters. It is not productive for smallmouth bass and apparently is not used upstream from the mouth for fishing except for a few anglers seeking a few trout. It may support an occassionally spring smelt fishery although small falls prevent their movement more than a few yards upstream from the Lake.

To my knowledge, there are no endangered Lake Erie Species or critical habitat that maybe effected by construction at this site.

Respectfully,

Roger B. Kenyon

RBK/mjf

NCBPD-ER

06 JUL 1984

SUBJECT: Harborcreek, PA Beach Restoration and Small Navigation Study - Land Use

OFC. MGMT. OAS
6 JUL 84 13 21

Mr. Harry Bittle
Deputy for Environmental Protection
Commonwealth of Pennsylvania
Department of Environmental Resources
Press Office, 9th Floor
Fulton Building, Box 2063
Harrisburg, PA 17120

Dear Mr. Bittle:

The U.S. Army Corps of Engineers, Buffalo District, is currently studying the feasibility of providing small-boat harbor improvements and beach restoration at Shades Beach Park, Township of Harborcreek, Erie County, Pennsylvania. The Corps of Engineers has authority to restore historic shorelines under Section 103 of the 1962 River and Harbor and Flood Control Act, as amended. The authority to assist communities in small navigation improvements comes from Section 107 of the 1960 River and Harbor and Flood Control Act, as amended. Enclosure 1 gives a brief description of the study area and presents three possible alternatives for Shades Beach Park.

Implementation of the National Environmental Policy Act of 1969, as amended, requires that Federal agencies 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". As a part of this early "scoping" process, I wish to invite your participation in this study.

In order to fully assess the relationship between any Corps of Engineers actions and the plans of other agencies, we would appreciate knowing whether your agency has reviewed or formulated existing or proposed land use plans, policies, or controls for the project area. An evaluation of master plans, zoning regulations, plans developed in response to the Clean Air and Clean Water Acts of 1977, or other related land use proposals of your agency, would be helpful in this respect. Please respond within 30 days of the date of this letter.

Correspondence pertaining to this matter should be addressed to the District Commander, U.S. Army Engineer District, Buffalo, 1776 Niagara Street, Buffalo, NY 14207, ATTN: Mr. Philip Berkeley. If you have any questions or

Ev. 1/31
6/21/

NCBPD-ER
SUBJECT: Harborcreek, PA Beach Restoration and Small Navigation Study - Land Use

require additional information, please contact Mr. Berkeley of my Environmental Analysis Branch at 716-876-5454, extension 2171.

Sincerely,

SIGNED

ROBERT R. HARDIMAN
Colonel, Corps of Engineers
District Commander

1 Enclosure
as stated

Copy Furnished:
NCBPD-ER
NCBPD (Reading File)
NCBPD-S

SHADES BEACH PARK SECTION 103 & 107 STUDY

HARBORCREEK, ERIE COUNTY, PENNSYLVANIA

20 June 1984

1. Three preliminary plans for a proposed boat launching facility and/or beach restoration at Shades Beach Park, Harborcreek, Pennsylvania have been developed.

2. Shades Beach Park is located on the south shore of Lake Erie in the Town of Harborcreek, Erie County, Pennsylvania, bordering the left bank of Eightmile Creek (Plate 1). The entrance to the park is on East Lake Road (PA 5) about 12 miles east of the entrance to Presque Isle, Pennsylvania. A map of the park is presented on Plate 2. The park has picnicing and playground facilities as well as a small beach fronting a boat house with a rail mounted boat launcher. The beach is formed by trapping sand updrift of a 100 foot long groin.

PLAN A: RUBBLEMOUND BREAKWATERS PROTECTING LAUNCH RAMP

3. This plan, illustrated on Plate 3, involves constructing two rubblemound breakwaters to shelter the proposed boat ramp and existing rail mounted boat launcher.

PLAN B: RUBBLEMOUND/CONCRETE CORE BREAKWATERS PROTECTING LAUNCH RAMP

4. This plan is essentially the same as Plan A except for the partial usage of a concrete core in the west breakwater. This plan would utilize 27 reinforced concrete railroad shanties, owned by the Town of Harborcreek, as a concrete core to the west breakwater. Plan B is illustrated on Plate 4.

PLAN C: RUBBLEMOUND BREAKWATERS PROTECTING BOAT LAUNCH RAMP AND OFFSHORE BREAKWATER TO PROTECT BEACH

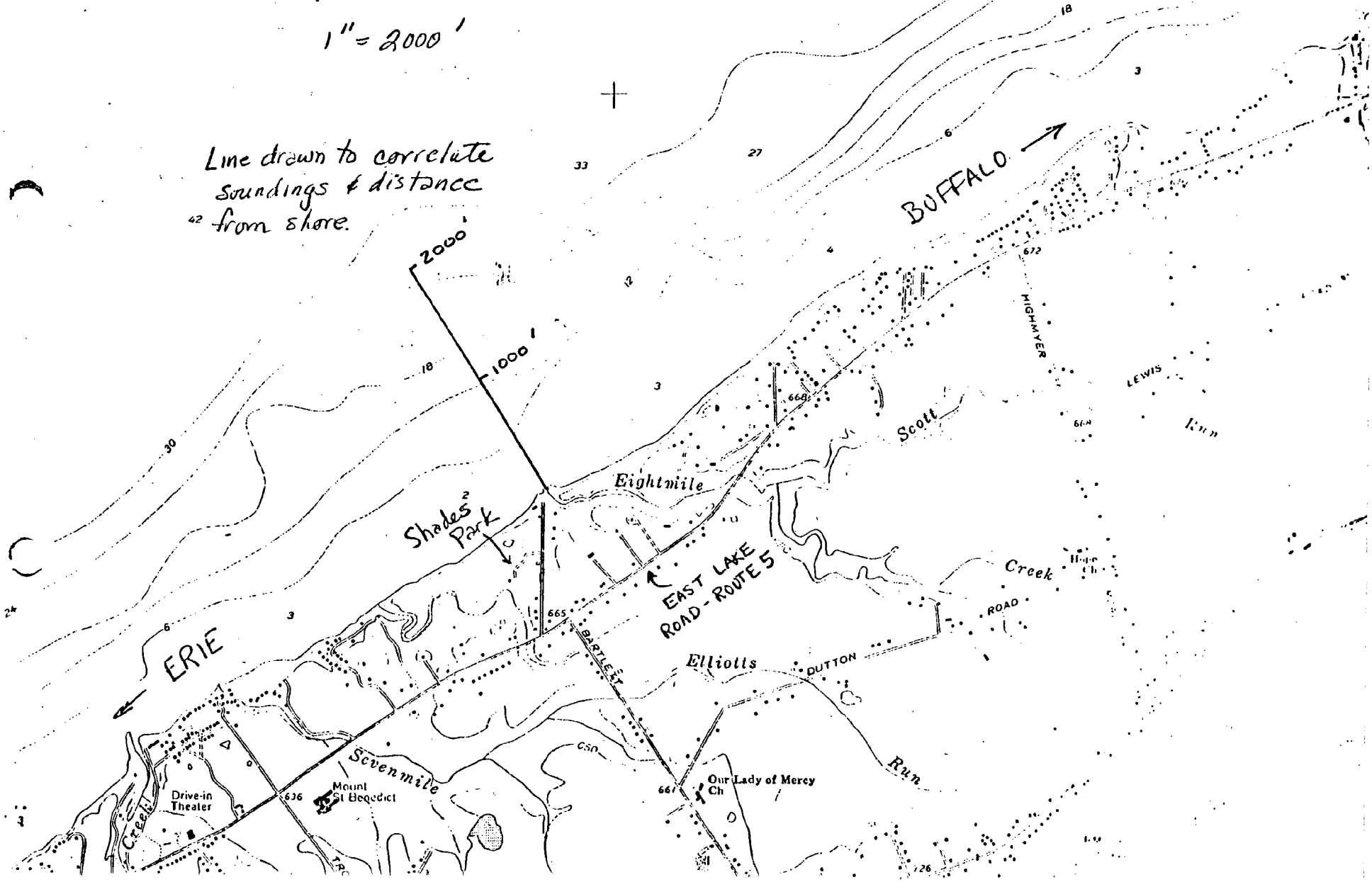
5. This plan is the same as Plan A with the addition of a beach stabilized by an offshore breakwater. The beach will abut the west breakwater and will be a maximum of 85 feet wide and 450 feet long. A 125 foot long offshore breakwater will be located 200 feet from the bluff and 175 feet from the west breakwater. Initial placement of 660 cubic yards of sand will be required with annual nourishment estimated at about 70 cubic yards per year. Plan C is illustrated on Plate 5.

Enclosure 1

PLATE 1

HARBORCREEK, PA
QUAD SHEET
1" = 2000'

Line drawn to correlate soundings & distance from shore.



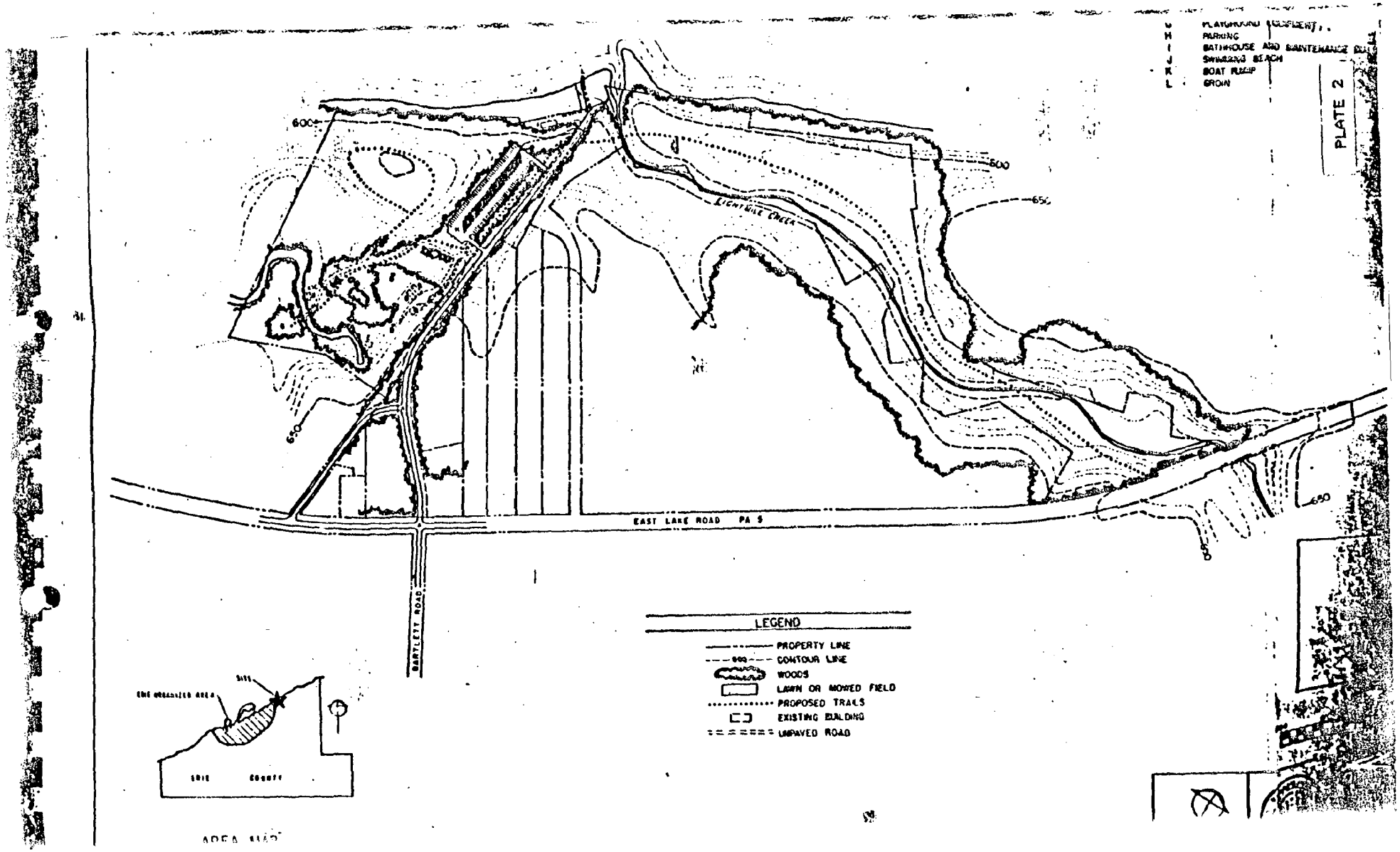


PLATE 2
H PARKING
I BATHHOUSE AND MAINTENANCE BU
J SWIMMING BEACH
K BOAT RAMP
L GRASS
600
650
EAST LAKE ROAD PA 5
BARTLETT ROAD
LEGEND
PROPERTY LINE
CONTOUR LINE
WOODS
LAWN OR MOWED FIELD
PROPOSED TRAILS
EXISTING BUILDING
UNPAVED ROAD

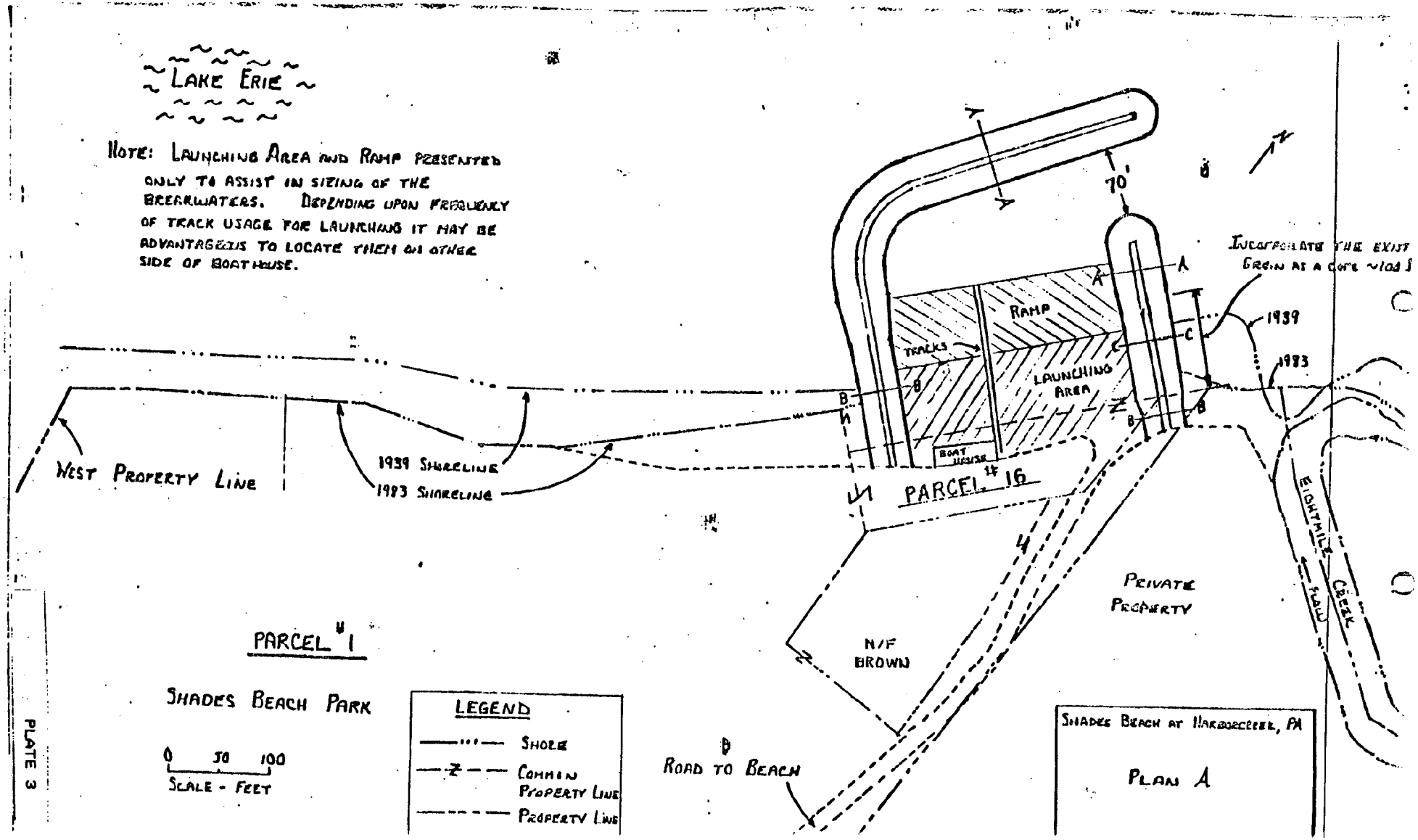
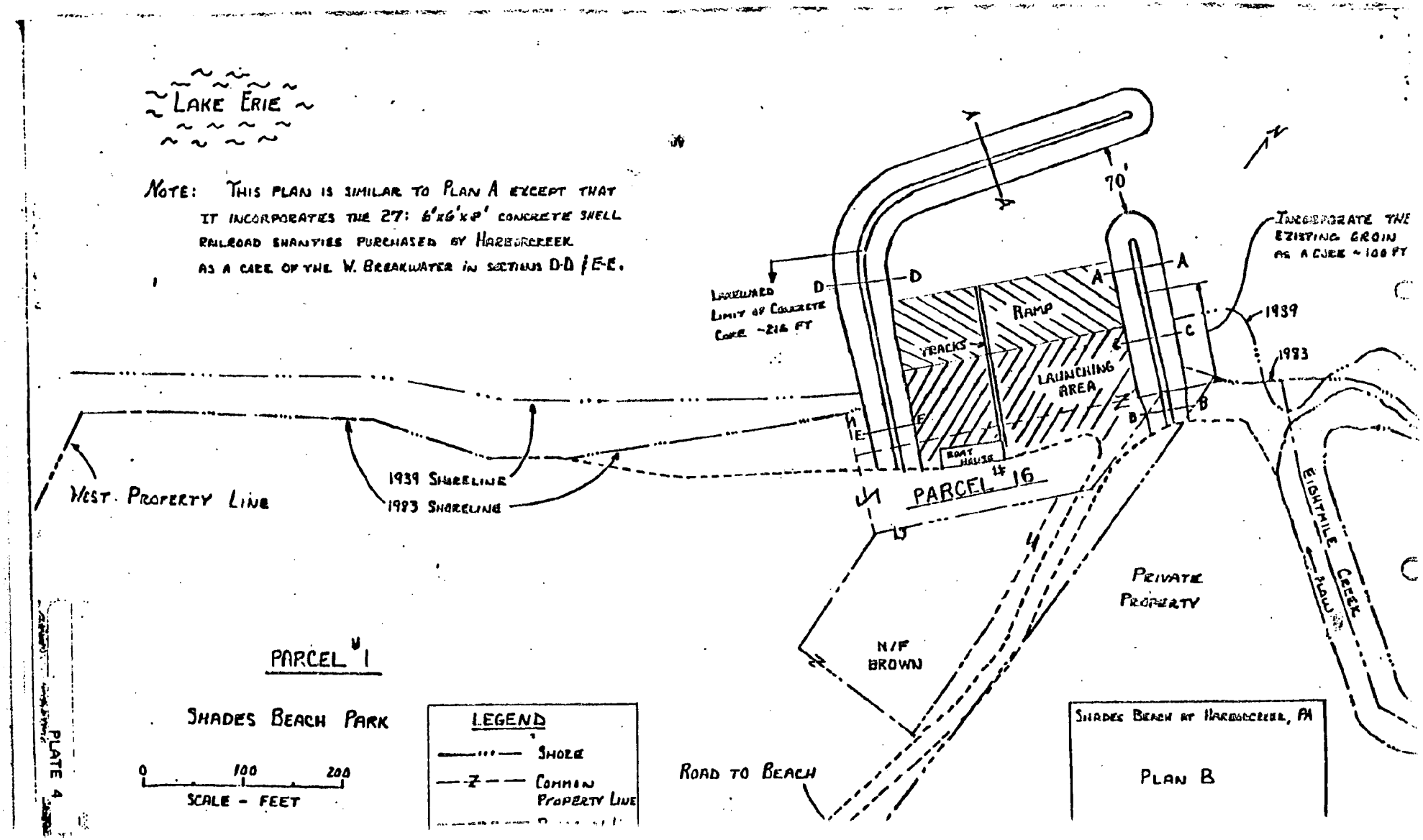
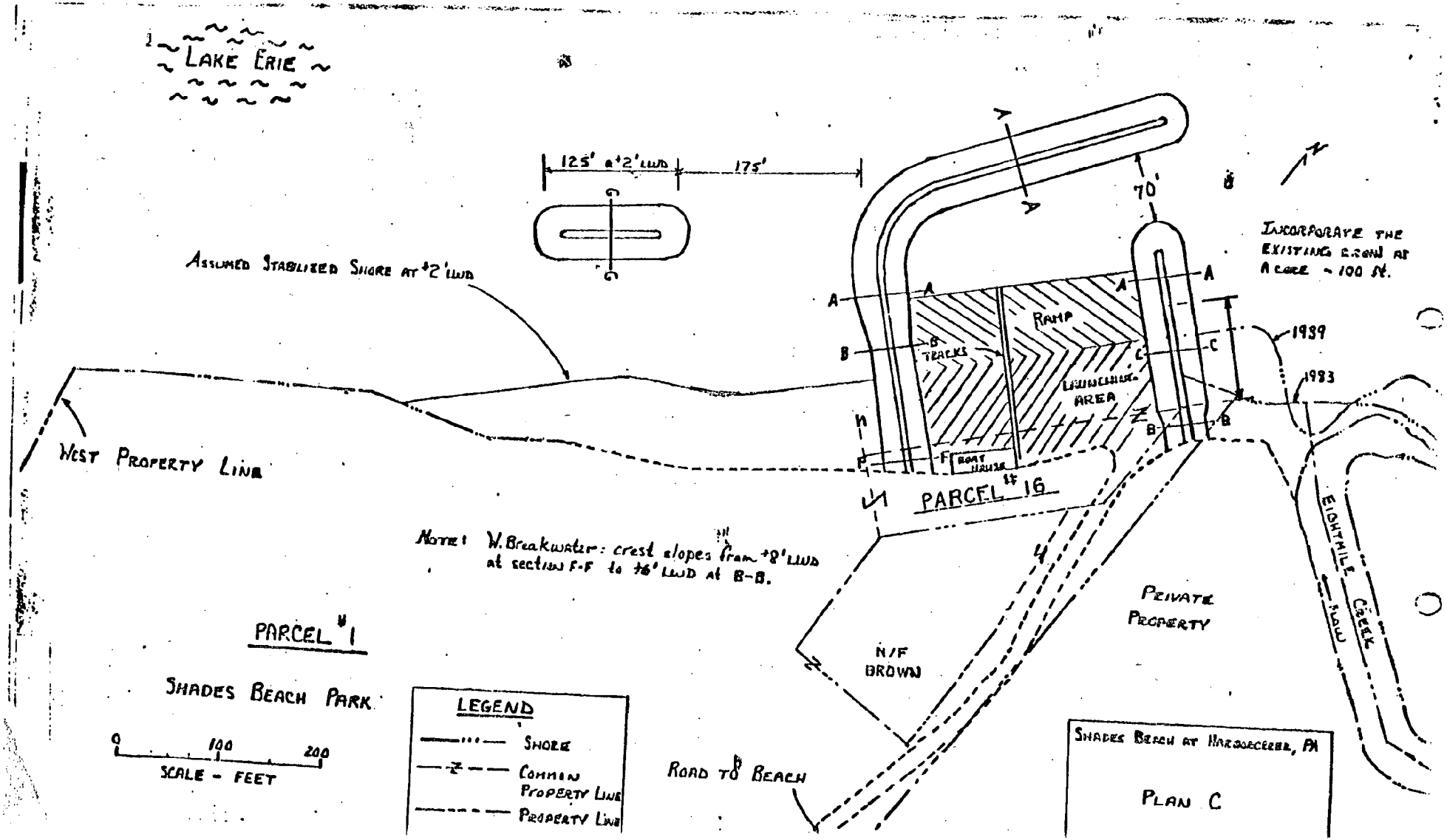

LAKE ERIE
NOTE: LAUNCHING AREA AND RAMP PRESENTED ONLY TO ASSIST IN SIZING OF THE BREAKWATERS. DEPENDING UPON FREQUENCY OF TRACK USAGE FOR LAUNCHING IT MAY BE ADVANTAGEOUS TO LOCATE THEM ON OTHER SIDE OF BOATHOUSE.
70'
RAMP
TRACKS
LAUNCHING AREA
BOAT HOUSE
1939
1983
INCORPORATE THE EXIST
WEST PROPERTY LINE
1939 SHORELINE
1983 SHORELINE
PARCEL # 16
PRIVATE PROPERTY
N/F BROWN
EIGHTMILE CREEK
ROAD TO BEACH
PARCEL # 1
SHADES BEACH PARK
0 50 100
SCALE - FEET
LEGEND
SHORE
COMMON PROPERTY LINE
PROPERTY LINE
SHADES BEACH AT HARBORCREEK, PA
PLAN A

PLATE 3


LAKE ERIE
NOTE: THIS PLAN IS SIMILAR TO PLAN A EXCEPT THAT IT INCORPORATES THE 27: 6'x6'x8' CONCRETE SHELL RAILROAD SHANTIES PURCHASED BY HARBORCREEK AS A CORE OF THE W. BREAKWATER IN SECTIONS D-D & E-E.
70'
INCORPORATE THE EXISTING GROIN AS A CORE ~100 FT
LANDWARD LIMIT OF CONCRETE CORE ~216 FT
RAMP
TRACKS
LAUNCHING AREA
BOAT HOUSE
1939
1983
WEST PROPERTY LINE
1939 SHORELINE
1983 SHORELINE
PARCEL 16
PRIVATE PROPERTY
EIGHTMILE CREEK
N/F BROWN
ROAD TO BEACH
PARCEL 1
SHADES BEACH PARK
0 100 200
SCALE - FEET
LEGEND
SHORE
COMMON PROPERTY LINE
SHADES BEACH AT HARBORCREEK, PA
PLAN B
PLATE 4


LAKE ERIE
125' @ +2' LWD
175'
70'
ASSUMED STABILIZED SHORE AT +2' LWD
INCORPORATE THE EXISTING BROWN AT A CASE ~ 100 ft.
RAMP
TRACKS
LAUNCHING AREA
1939
1983
WEST PROPERTY LINE
PARCEL 16
NOTE: W. Breakwater: crest slopes from +8' LWD at section F-F to +6' LWD at B-B.
PARCEL 1
SHADES BEACH PARK
PRIVATE PROPERTY
N/F BROWN
EIGHTMILE CREEK
FLOW
ROAD TO BEACH
0 100 200
SCALE - FEET
LEGEND
SHORE
COMMON PROPERTY LINE
PROPERTY LINE
SHADES BEACH AT HARBORCREEK, PA
PLAN C

05 JUL 1984

NCBPD-ER

SUBJECT: Harborcreek, PA Beach Restoration and Small Navigation Study - Fish and Wildlife Resources

OFC. MGMT. OAS
5 JUL 84 12 51 D

The U.S. Army Corps of Engineers, Buffalo District, is currently studying the feasibility of providing small-boat harbor improvements and beach restoration at Shades Beach Park, Township of Harborcreek, Erie County, Pennsylvania. The Corps of Engineers has authority to restore historic shorelines under Section 103 of the 1962 River and Harbor and Flood Control Act, as amended. The authority to assist communities in small navigation improvements comes from Section 107 of the 1960 River and Harbor and Flood Control Act, as amended. Enclosure 1 gives a brief description of the study area and presents three possible alternatives for Shades Beach Park.

Implementation of the National Environmental Policy Act of 1969, as amended, requires that Federal agencies 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". As a part of this early "scoping" process, I wish to invite your participation in this study.

In order to identify significant resources and the plans of other agencies within the study area, and to fully assess the range of possible impacts resulting from the proposed Corps action, I would appreciate any information or comments you may have especially with respect to fish and wildlife resources, threatened and endangered species, critical habitat, and unique ecological sites for the project area. Please respond within 30 days of the date of this letter.

Correspondence pertaining to this matter should be addressed to the District Commander, U.S. Army Engineer District, Buffalo, 1776 Niagara Street, Buffalo, NY 14207, ATTN: Mr. Philip Berkeley. If you have any questions or

NCBPD-ER

SUBJECT: Harborcreek, PA Beach Restoration and Small Navigation Study - Fish and Wildlife Resources

require additional information, please contact Mr. Berkeley of my Environmental Analysis Branch at 716-876-5454, extension 2171.

Sincerely,

SIGNED

ROBERT R. HARDIMAN
Colonel, Corps of Engineers
District Commander

1 Enclosure
as stated

Copy Furnished:
✓NCBPD-ER
NCBPD (Reading File)
NCBPD-S

LETTERS SENT TO THE FOLLOWING:

Mr. Charles J. Kulp
Field Supervisor
U.S. Fish and Wildlife Service
Suite 322
315 South Allen Street
State College, PA 16801

Mr. Roger E. Kenyon
Lake Erie Research Unit
Pennsylvania Fish Commission
Fairview Station
P.O. Box 531
Fairview, PA 16415

Mr. Glen L. Bowers
Executive Director
Commonwealth of Pennsylvania
Pennsylvaina Game Commission
P.O. Box 1567
Harrisburg, PA 17120

mailed 6/29/84

NCBPD-ER

02 JUL 1984

SUBJECT: Harborcreek, PA Beach Restoration and Small Navigation Study - Land Use

OFC. MGMT. OAS
2 JUL 84 14 09

Commander
Ninth Coast Guard District
U.S. Department of Transportation
1240 East Ninth Street
Cleveland, OH 44199

1. The U.S. Army Corps of Engineers, Buffalo District, is currently studying the feasibility of providing small-boat harbor improvements and beach restoration at Shades Beach Park, Township of Harborcreek, Erie County, Pennsylvania. The Corps of Engineers has authority to restore historic shorelines under Section 103 of the 1962 River and Harbor and Flood Control Act, as amended. The authority to assist communities in small navigation improvements comes from Section 107 of the 1960 River and Harbor and Flood Control Act, as amended. Enclosure 1 gives a brief description of the study area and presents three possible alternatives for Shades Beach Park.

2. Implementation of the National Environmental Policy Act of 1969, as amended, requires that Federal agencies 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". As a part of this early "scoping" process, I wish to invite your participation in this study.

3. In order to fully assess the relationship between any Corps of Engineers actions and the plans of other agencies, we would appreciate knowing whether your agency has reviewed or formulated existing or proposed land use plans, policies, or controls for the project area. An evaluation of master plans, zoning regulations, plans developed in response to the Clean Air and Clean Water Acts of 1977, or other related land use proposals of your agency, would be helpful in this respect. Please respond within 30 days of the date of this letter.

/ 6-27-

NCBPD-ER
SUBJECT: Harborcreek, PA Beach Restoration and Small Navigation Study - Land Use

4. My point of contact pertaining to this matter is Mr. Philip Berkeley of my Environmental Analysis Branch who can be contacted at commercial number (716) 876-5454, extension 2171 or FTS 473-2171.

[redacted]
Chief, Engineering Division

ROBERT R. HARDIMAN
Colonel, Corps of Engineers
District Commander

1 Enclosure
as stated

✓ Copy Furnished:
NCBPD-ER
NCBPD (Reading File)
NCBPD-S

NCBPD-ER

02 JUL 1984

SUBJECT: Harborcreek, PA Beach Restoration and Small Navigation Study - Land Use

OFC. MGMT. OAS
2 JUL 84 13 46

The U.S. Army Corps of Engineers, Buffalo District, is currently studying the feasibility of providing small-boat harbor improvements and beach restoration at Shades Beach Park, Township of Harborcreek, Erie County, Pennsylvania. The Corps of Engineers has authority to restore historic shorelines under Section 103 of the 1962 River and Harbor and Flood Control Act, as amended. The authority to assist communities in small navigation improvements comes from Section 107 of the 1960 River and Harbor and Flood Control Act, as amended. Enclosure 1 gives a brief description of the study area and presents three possible alternatives for Shades Beach Park.

Implementation of the National Environmental Policy Act of 1969, as amended, requires that Federal agencies 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". As a part of this early "scoping" process, I wish to invite your participation in this study.

In order to fully assess the relationship between any Corps of Engineers actions and the plans of other agencies, we would appreciate knowing whether your agency has reviewed or formulated existing or proposed land use plans, policies, or controls for the project area. An evaluation of master plans, zoning regulations, plans developed in response to the Clean Air and Clean Water Acts of 1977, or other related land use proposals of your agency, would be helpful in this respect. Please respond within 30 days of the date of this letter.

Correspondence pertaining to this matter should be addressed to the District Commander, U.S. Army Engineer District, Buffalo, 1776 Niagara Street, Buffalo, NY 14207, ATTN: Mr. Philip Berkeley. If you have any questions or

P. 6/27/84

NCBPD-ER
SUBJECT: Harborcreek, PA Beach Restoration and Small Navigation Study - Land Use

require additional information, please contact Mr. Berkeley of my Environmental Analysis Branch at 716-876-5454, extension 2171.

Sincerely,

[redacted]
[redacted], Engineering [redacted]

ROBERT R. HARDIMAN
Colonel, Corps of Engineers
District Commander

1 Enclosure
as stated

√Copy Furnished:
NCBPD-ER
NCBPD (Reading File)
NCBPD-S

NCBPD-ER

28 JUN 1984

SUBJECT: Harborcreek, PA Beach Restoration and Small Navigation Study - Cultural Resources

OFC. MGMT. DAS
28 JUN 84 10 400

Ms. Brenda Barrett, Director
Bureau for Historic Preservation
Pennsylvania Historical and Museum Commission
William Penn Memorial Museum and Archieves Bldg.
Box 1026
Harrisburg, PA 17120

Dear Ms. Barrett:

The U.S. Army Corps of Engineers, Buffalo District, is currently studying the feasibility of providing small-boat harbor improvements and beach restoration at Shades Beach Park, Township of Harborcreek, Erie County, Pennsylvania. The Corps of Engineers has authority to restore historic shorelines under Section 103 of the 1962 River and Harbor and Flood Control Act, as amended. The authority to assist communities in small navigation improvements comes from Section 107 of the 1960 River and Harbor and Flood Control Act, as amended. Enclosure 1 gives a brief description of the study area and presents three possible alternatives for Shades Beach Park.

Implementation of the National Environmental Policy Act of 1969, as amended, requires that Federal agencies 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". As a part of this early "scoping" process, I wish to invite your participation in this study.

In order to identify significant resources within the study area and to fully assess the range of possible impacts resulting from the proposed Corps action, I would appreciate any information you may have on known cultural resources in the project area as well as your comments and recommendations. Please respond within 30 days of the date of this letter.

Correspondence pertaining to this matter should be addressed to the District Commander, U.S. Army Engineer District, Buffalo, 1776 Niagara Street, Buffalo, NY 14207, ATTN: Mr. Philip Berkeley. If you have any questions or

LETTERS SENT TO THE FOLLOWING:

Mr. Bruce Blanchard
Director
Office of Environmental Project Review
U.S. Department of the Interior
18th and C Streets, NW, Room 424-1
Washington, DC 20240

Regional Administrator
Region 3
Federal Highway Administration
Room 1633
George H. Fallon Federal Office Bldg.
31 Hopkins Plaza
Baltimore, MD 21201

Mr. Marvin Akerly
Supervisor
Harbor Creek Township Supervisors
5601 Buffalo Road
Harborcreek, PA 16421-1698 mailed 4/29/84

Mr. Shamus Malone
PA Coastal Zone Management Office
Evangelical Press Bldg. Room B21
3rd & Reilley Streets
Harrisburg, PA 17120

Mr. John R. Pomponio, Chief
EIS and Wetlands Review Section
U.S. Environmental Protection Agency
6th and Walnut Streets
Philadelphia, PA 19106

Mr. Peter S. Duncan
Commonwealth of Pennsylvania
Department of Environmental Resources
P.O. box 2063
Harrisburg, PA 17120

Mr. James H. Olson
State Conservationist
U.S. Department of Agriculture
Soil Conservation Service
Box 985
Federal Square Station
Harrisburg, PA 17108

Mr. Peter A Yeager, Chief
Planning Section
Bureau of Water Quality Management
Commonwealth of Pennsylvania
Department of Environmental Resoureces
1012 Water Street
Meadville, PA 16335

6/2/13
R6/25/84

NCBPD-ER
SUBJECT: Harborcreek, PA Beach Restoration and Small Navigation Study - Cultural Resources

require additional information, please contact Mr. Berkeley of my Environmental Analysis Branch at 716-876-5454, extension 2171.

Sincerely,

DONALD H. LINDELL
Chief, Engineering Division

ROBERT R. HARDIMAN
Colonel, Corps of Engineers
District Commander

1 Enclosure
as stated

Copy Furnished:
✓NCBPD-ER
NCBPD (Reading File)
NCBPD-S

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION
WILLIAM PENN MEMORIAL MUSEUM AND ARCHIVES BUILDING
BOX 1026
HARRISBURG, PENNSYLVANIA 17120

August 16, 1984

OFC. MGMT. OAS
20 AUG 84 12 35

Robert R. Hardiman
Colonel, Corps of Engineers
Department of the Army
Duffalo District, Corps of
Engineers
1776 Niagara Street
Buffalo, New York, 14207

Re: ER #84-1425-049-A
Harborcreek, PA
Beach Restoration & Boat Ramp
Erie County

Dear Mr. Hardiman:

The above named project has been reviewed by the Bureau for Historic Preservation in accordance with Section 106 of the National Historic Preservation Act of 1966, Executive Order 11593 and the regulations of the Advisory Council on Historic Preservation (36 CFR 800).

There is a high probability that archeological resources may be affected by this project. A survey or limited testing of the area should be undertaken to locate potentially significant archeological resources. Guidelines and instructions for this phase are available from this office. If you have any questions, please contact Kurt Carr at (717) 783-5216.

Sincerely,

Donna Williams

Donna Williams, Chief
Division of Planning and Protection
Bureau for Historic Preservation

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
Post Office Box 1467
Harrisburg, Pennsylvania 17120
August 9, 1984

(717) 783-9500

In reply refer to
RM-WR
CZ7:G

OFC. MGMT. OAS
13 AUG 84 12 49

Colonel Robert R. Hardiman
District Commander
U. S. Army Engineer District/Buffalo
1776 Niagara Street
Buffalo, NY 14207

Attn: Mr. Philip Berkeley

Dear Colonel Hardiman:

This letter is in reply to your July 2, Public Notice requesting comments concerning the Harborcreek, Pennsylvania, Beach Restoration and Small Navigation Study - Land Use. The Pennsylvania Coastal Zone Management (CZM) Program has policies concerning the encouragement of development of public access in coastal areas, and the regulation of encroachments along Lake Erie with respect to impact on bluff recession and beach erosion. As such, we are very much interested in the Corps' proposed plan at Shades Beach. The Shades Beach site has been designated as a Geographical Area of Particular Concern with recreational value by the Pennsyvlania CZM Program. This designation has resulted because the site provides needed public access to Lake Erie, while being located in an area of the County that has limited public access.

In addition, shoreline properties around Shades Beach are experiencing severe erosion problems. Our concern is to provide public access along Lake Erie, while at the same time not exacerbating the shoreline erosion problem. As you may be aware, the proposed project could possibly increase the erosion of the shoreline east of Shades Beach which is currently considered a high hazard (erosion) area.

We are providing you with a CZM funded study (attached) entitled, Coastal Erosion Inventory that may be useful, as it sheds some light on erosion problems in this area.

Furthermore, we have sent a copy of the Public Notice to the Erie County Department of Planning for their review and comment. They had not received notification but were very much interested and may provide comments.

In conclusion, let me remind you that as per the Federal Coastal Zone Management Act, any Federal development projects undertaken by the Corps in Pennsylvania's Coastal Zone requires a consistency determination from this Division.

We appreciate the notification and please keep us informed of pertinent plans as they develop.

Sincerely,

William Johnson

E. James Tabor, Chief
Division of Coastal Zone Management
Bureau of Water Resources Management

for

Enclosure

U.S. Department of Transportation
United States Coast Guard

Commander,
Ninth Coast Guard District

1240 E. Ninth St.
Cleveland, Ohio 44199
Staff Symbol: (oan)
Phone: (216) 522-3991

16504
Ser. 252-84
02 August 1984

Mr. Philip Berkeley
Environmental Analysis Branch
Buffalo District Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Mr. Berkeley:

Upon review of your feasibility study for improvement of the Harbor Creek, Pennsylvania small-boat harbor the U. S. Coast Guard Aids to Navigation Branch has determined that, in the event this project becomes a reality, a navigational aid will be required on the extremity of the West breakwater arm.

In view of the limited width of the East Entrance and the possible increase in small-craft traffic, we would require the aid on the west breakwater arm to be lighted.

In addition, we would require a day beacon be established on the extremity of the East Breakwater structure.

Please advise this office in the event this project reaches the construction stage so we may plan our funding for these aid structures.

Sincerely,

R. H. SMOYER
Lieutenant, U. S. Coast Guard
Chief, Aids to Navigation Branch
Acting
By direction of the Commander,
Ninth Coast Guard District

OFC. NGHT. OAS
6 AUG 84 12 51

TELEPHONE OR VERBAL CONVERSATION RECORD

For use of this form, see AR 340-15; the proponent agency is The Adjutant General's Office.

DATE: 2 August 1984

SUBJECT OF CONVERSATION

Harborcreek, PA Beach restoration & Small Navigation Study

INCOMING CALL

PERSON CALLING	ADDRESS	PHONE NUMBER AND EXTENSION
Larry Toth	PACZM office Harrisburg	(717) 783-9500
PERSON CALLED	**OFFICE**	**PHONE NUMBER AND EXTENSION**
Heicher	NCBPD-ER	X2171

OUTGOING CALL

PERSON CALLING	OFFICE	PHONE NUMBER AND EXTENSION
PERSON CALLED	**ADDRESS**	**PHONE NUMBER AND EXTENSION**

SUMMARY OF CONVERSATION

Mr. Toth is responding to our letters of 2 July 1984 to Mr. Shamus Malone of PACZM and 6 July 1984 to Mr. Harry Bittle of the PADER. He said that he had also sent a copy of the project plans to Mr. Dave Skellie of the Erie County Planning Department.

Mr. Toth stated that comments from his office will be late, but should be in the Buffalo District Office by the middle of next week. The PACZM Office desires recreational development, but he expressed some concerns regarding erosion to the east of the project site.

David W. Heicher, Biologist

DA FORM 1 APR 66 751 REPLACES EDITION OF 1 FEB 58 WHICH WILL BE USED.

NCBPD-S
SUBJECT: Initiation of an Initial Appraisal of the Beach Erosion and Navigation Needs in Harborcreek, PA

require additional information, please contact Mr. Merick of my Small Projects Branch at (716) 876-5454, extension 2144.

Sincerely,

JOSEPH V. CREEDEN, MAJOR

ROBERT H. HARDIMAN
Colonel, Corps of Engineers
District Commander

2 Enclosure
as stated

Copy Furnished:

Honorable Thomas J. Ridge
House of Representatives
1331 Longworth HOB
Washington, DC 20515

Honorable Thomas J. Ridge
Representative in Congress
Federal Building, 6th and State Streets
Erie, PA 16501

Honorable Arlen Specter
United States Senate
Washington, DC 20510

Honorable H. John Heinz III
United States Senate
Washington, DC 20510

NCBPD-S

OFC. MGMT. OAS
14 Feb 84 10 21

Harborcreek Township Supervisors

GERALD R. BLANCHFIELD
JAMES W. SONNEY
MARVIN L. AKERLY

ELEANOR H. MUSGRAVE
SECRETARY AND TREASURER
PHONE 814/899-3171

February 13, 1984

Col. Robert R. Hardiman
U. S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, New York 14207

Subject: Shades Beach
Harborcreek Township
Erie County, Pennsylvania

Dear Sir:

On January 11, 1984, Mr. Bill Werick and Mr. Denton Clark from your office met with representatives of Harborcreek Township to discuss proposed imporvements at Shades Beach Township Park. The impovements under consideration would result in both beach replenishment as well as navigational improvements which would benefit users of the park.

As a result of our meeting, we hereby request an "Initial Appraisal" report be performed on the proposed improvements as discussed with Mr. Werick and Mr. Clark. If we can be of any assistance during the preparation of the report, feel free to contact myself at Harborcreek Township, phone 814-899-3171.

Thank you for your assistance in our endeavors to improve the recreational facilities at Shades Beach.

Sincerely yours,

HARBORCREEK TOWNSHIP SUPERVISORS

Marvin L. Akerly

Marvin L. Akerly, Chairman
THE BOARD OF SUPERVISORS

MLA/em

Northwest Engineering Inc.

Consultants and Civil Engineers

January 12, 1984

Col. Robert R. Hardiman
U. S. Army Engineer District, Buffalo
1776 Niagara St.
Buffalo, New York 14207

Subject: Shades Beach
Harborcreek Township
Erie Co., Pennsylvania

Dear Sir:

On January 11, 1984 Mr. Bill Werick and Mr. Denton Clark from your office met with representatives of Harborcreek Township to discuss proposed improvements at Shades Beach Township Park. The improvements under consideration would result in both beach replenishment as well as navigational improvements which would benefit users of the park.

As a result of our meeting, we hereby request an "Initial Appraisal" report be performed on the proposed improvements as discussed with Mr. Werick and Mr. Clark. If we can be of any assistance during the preparation of the report, feel free to contact either myself or Mr. Marvin Akerly at Harborcreek Township, phone 814-899-3171.

Thank you for your assistance in our endeavors to improve the recreational facilities at Shades Beach.

Sincerely yours,

Paul R. Groney

Paul R. Groney, P.E.

PRG:ck

cc: Harborcreek Township
Harvey Stone
File

2635 West 26th Street Erie, Pennsylvania 16506
Telephone (814) 833-3908

OFC. MGMT. OAS 23 NOV 1983

23 Nov 83 14 44

NCBPD-S

SUBJECT: Proposed Navigation Improvements at Harborcreek, Pennsylvania

Mr. Marvin L. Akerly
Supervisor
Harborcreek Township Supervisors
5601 Buffalo Road
Harborcreek, PA 16421-1698

Dear Mr. Akerly:

This is in regard to your 9 November 1983 letter to me concerning navigation improvements at Harborcreek, Pennsylvania.

As Mr. William Werick of my Small Projects Branch explained in an 18 November telephone conversation with your fellow supervisor Mr. Gerald R. Blanchfield, I can assist in the following manner.

A member of my staff will visit the site of the proposed improvements and comment on your proposals. The trip will be arranged for our mutual convenience sometime between Thanksgiving and Christmas. Mr. Werick will call you to arrange a time. During this visit my staff will determine the applicability of Section 107 of the 1960 Rivers and Harbors Act, which provides the Corps the authority to study and construct small navigation improvements. Under the terms of this law, I can initiate an "Initial Appraisal" report upon your request. The purpose of that report is to determine, after preliminary review of existing data, if further Federal involvement is warranted. Details on this program will be furnished to you at the time of the visit to the site.

I draw your attention to the fact that these are not grant programs. Should you decide to study and design the navigation improvements yourself, the Corps involvement would be limited to whatever review was necessary to authorize or deny a permit for construction of the improvements. There would be no financial assistance from the Corps.

LS/2144
11-23-83

NCBPD-S
SUBJECT: Proposed Navigation Improvements at Harborcreek, Pennsylvania

All correpondence on this matter should be addressed to the District Commander, Attention Mr. William Werick. If you have any questions, please call Mr. Werick at (716) 876-5454, extension 2144.

Sincerely,

DONALD G. LIDDELL
Chief, Engineering Division

ROBERT R. HARDIMAN
Colonel, Corps of Engineers
District Commander

CF:
~~NCBPD-S~~

ENVIRONMENTAL CONSIDERATIONS

U.S. ARMY CORPS OF ENGINEERS
INITIAL APPRAISAL REPORT EXCERPT

ENVIRONMENTAL CONSIDERATIONS

In order to characterize the resource base of the project area, information has been obtained from existing literature and coordination with those Federal, State, and local agencies charged with administering fish and wildlife resources, cultural resources, and land use plans. Project coordination was initiated in June and July 1984 via letter with agencies including: the U.S. Department of Interior - Fish and Wildlife Service, the U.S. Environmental Protection Agency, the U.S. Department of Agriculture Soil Conservation Service, the Federal Highway Administration, the U.S. Coast Guard, the Pennsylvania Department of Environmental Resources, the Pennsylvania Fish Commission, the Pennsylvania Game Commission, the Pennsylvania Coastal Zone Management Office, the Pennsylvania Historical and Museum Commission, the Erie County Department of Planning and the Harborcreek Township Supervisors. Initial correspondence with the Harborcreek Township Supervisors pertaining to project consideration occurred in January, February, and March of 1984. Reference the Correspondence Appendix A.

The Pennsylvania Fish Commission noted in their 23 July 1984 letter that Eightmile Creek sustains intermittent runs or ascensions of steelhead and coho salmon during seasonal periods of high water and stream discharge usually in late fall, winter, and early spring. These "runs" are not spectacular or frequent although a midwinter steelhead fishery at the mouth is known to be popular by a few sport fishermen.

Most agencies were supportive of the recreational benefits of the project. Major concerns expressed by the various agencies about the project include: consistency with the Pennsylvania Coastal Zone Management Policies; a need for navigation assistance facilities; impacts to littoral drift and associated impacts to fish habitat, erosion, and continued fishery access to Eightmile Creek, project construction and maintenance scheduling; adequate fishing access, and use of clean construction and beach nourishment materials. Correspondence Appendix A includes a "Preliminary Environmental Compliance Summary".

The Pennsylvania Historic and Museum Commission also indicated that there is a high probability that archaeological resources may be affected by this project and that a survey or limited testing of the area should be undertaken to locate potentially significant archaeological resources in future studies.

Alternatives and concerns would be further developed and assessed in the next phase of study. Preliminary assessment of alternatives (Reference the "Preliminary Environmental Compliance Summary, Appendix D) indicate that project implementation benefits could be realized for: Man-Made Resource, Desirable Community and Regional Growth, Community Cohesion, Business and Industry, Employment and Income, Public Facilities and Services, Property Values and Tax Revenue, and aesthetics. Possible minor to moderate initial adverse impacts could occur to Natural Resources, Air

Quality, Water Quality, Noise, and Aesthetics. No Displacement of People or Farms should occur. Adverse impacts could be substantially reduced by incorporation or environmental design measures or possibly necessary mitigation measures. Major environmental work that would need to be completed if the study continues includes: continued environmental coordination, preparation of a more detailed environmental assessment and Finding of No Significant Impact (FONSI) or Environmental Impact Statement (EIS) as appropriate, preparation of a Section 404(b)(1) evaluation report and public notice, coordination and preparation for a U.S. Fish and Wildlife Coordination Act Report (FWS-CAR), preparation and coordination of a Coastal Zone Management consistency report, and further cultural resources investigation.

PRELIMINARY ENVIRONMENTAL ASSESSMENT

As required for implementation of NEPA (Reference Paragraph k., "Preliminary Environmental Compliance Summary", Appendix D) as promulgated by DOD-COE Section 122 Guidelines the preliminary considered alternatives have been assessed relative to Section 122 Guideline environmental evaluation parameters as follows:

Table 12 - Evaluation of Environmental Impacts

Section 122 Criteria (P.L. 91-611)	Plans A & B Launch Protection Probable Impact	Plan C Beach Protection Probable Impact	Remarks
Natural Resources	ST: Minor Adverse LT: Minor Beneficial	ST: Minor Adverse LT: Minor Beneficial	Probably minor adverse impacts during construction. Fish may be temporarily driven out of the construction area. Some existing fishery habitat may be lost but new (variety) habitat would be created. Care must be taken to protect fishery utilization of the stream outflow area. Provisions should be made for possible increased erosion east of the project and stream. Long term impact would probably not be significantly adverse. Needs further assessment. Reference correspondence. Plan C adds beach nourishment & protection.
Air Quality	ST: Minor Adverse LT: Not Significant	ST: Minor Adverse LT: Not Significant	There may be a minor decrease in air quality during construction at the project site due to increases in dust, odor, and vehicle emissions.
Water Quality	ST: Minor Adverse LT: Not Significant	ST: Minor Adverse LT: Not Significant	There may be a minor decrease in water quality during construction due to disturbance of bottom sediments, possible minor dredging, and (Plan C) beach nourishment. Possibly periodic maintenance dredging and beach nourishment.
Man-Made Resources	ST: Minor Adverse LT: Moderate Beneficial	ST: Minor Adverse LT: Moderate Beneficial	Improved beach (Plan C) and boat launch facilities. Accommodating facilities via existing park development.

Table 12 - Evaluation of Environmental Impacts (Cont'd)

Section 122 Criteria (P.L. 91-611)	Plans A & B Launch Protection Probable Impact	Plan C Beach Protection Probable Impact	Remarks
Desirable Community and Regional Growth	ST: Minor Beneficial LT: Minor Beneficial	ST: Moderate Beneficial LT: Moderate Beneficial	Consistant with community and regional needs, plans, and requests.
Community Cohesion	ST: Minor Beneficial LT: Minor Beneficial	ST: Moderate Beneficial LT: Moderate Beneficial	To date, overall community interests support.
Displacement of People	ST: NA LT: NA	ST: NA LT: NA	None.
Displacement of Farms	ST: NA LT: NA	ST: NA LT: NA	None.
Business and Industry Activity	ST: Minor Beneficial LT: Minor Beneficial	ST: Minor Beneficial LT: Minor Beneficial	Construction opportunities. Possibly some secondary benefits to service businesses in the area.
Employment and Income	ST: Minor Beneficial LT: Minor Beneficial	ST: Minor Beneficial LT: Minor Beneficial	Construction opportunities. Possibly minor additional park personnel.
Public Facilities and Services	ST: Minor Adverse LT: Moderate Beneficial	ST: Minor Adverse LT: Major Beneficial	Improved boat launch and (Plan C) beach. Improve shoreline access. Probably some minor modifications/improvements to existing park developments as accommodating facilities and services. Limited trailer turning area.

Table 12 - Evaluation of Environmental Impacts (Cont'd)

Section 122 Criteria (P.L. 91-611)	Plans A & B Launch Protection Probable Impact	Plan C Beach Protection Probable Impact	Remarks
Property Value and Tax Revenue	ST: Minor Adverse LT: Minor Beneficial	ST: Minor Adverse LT: Minor Beneficial	Improved county park property. Probably some expenditure of tax revenues for facility and service improvements. Probable return via usage.
Noise	ST: Minor Adverse LT: Not Significant	ST: Minor Adverse LT: Not Significant	Minor increase in noise due to operation of construction equipment. Possibly a slight increase in noise with increased utilization. Some residences in the area.
Aesthetics	ST: Minor Adverse LT: Moderate Beneficial	ST: Minor Adverse LT: Moderate Beneficial	Temporary disruption due to construction. Improvement to facilities and (Plan C) beach would improve aesthetics.

ST: Short Term
LT: Long Term
NA: Not Applicable

LOCAL COOPERATION

34. The local cooperation agreements document the responsibilities of the Federal and non-Federal agencies in a project. To meet the provisions of Section 107 of the 1960 River and Harbor Act, local interests would be required to furnish assurances that they will:

a. Provide, without cost to the United States, all lands, easements, and rights-of-way necessary for the construction and subsequent maintenance of the project and for aids to navigation, including suitable areas determined by the Chief of Engineers to be required in the general public interest for initial and subsequent disposal of dredged material;

b. Hold and save the United States free from damages due to construction and subsequent maintenance of the project, except damages due to the fault or negligence of the United States or its Contractors;

c. Provide servicing facilities open to all on equal terms as well as providing necessary policing and other services;

d. Provide dredging at entirely local cost in any berthing areas and minor accesses thereto;

e. Provide, without cost to the United States, all alterations and relocations of existing improvements including utilities, sewers, and other facilities required for construction of the project;

f. Prescribe and enforce regulations to prevent obstructions or encroachments that would interfere with proper functioning or maintenance prescribed by the Corps of Engineers;

g. Provide a cash contribution in an amount equal to 50 to 70 percent of the construction cost of the general navigation features directly attributable to recreational navigation, depending on the cost sharing policy in effect at the time of the signing of the local cooperation agreement.

h. Bear all responsibility and separable costs of operation, maintenance, and replacements allocated to sport fishing from the harbor structures;

i. Provide all project costs in excess of the Federal statutory cost limitation of $2,000,000, exclusive of aids to navigation;

j. Prepare, for approval of the Chief of Engineers prior to construction of the Federal improvement, a master plan for development of the necessary utilities and facilities for launching of recreational boats, including an adequate public landing with provision for potable water, and for the sale of motor fuel and lubricants;

k. Provide and maintain, without cost to the United States and to be available to all on equal terms, the improvements prescribed in the master plan, without material deviation therefrom unless approved by the Chief of Engineers;

l. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, Public Law 91-646, approved 2 January 1971, in acquiring lands, easements, and rights-of-way for construction and subsequent maintenance of the project, and inform affected persons of pertinent benefits, policies, and procedures in connection with said act;

m. Comply with Section 601 of Title VI of the Civil Rights Act of 1964 (PL 88-352) and Department of Defense Directive 5500.11 issued pursuant thereto and published in Part 300 of Title 32, Code of Federal Regulations, in connection with the maintenance and operation of the project.

35. In addition to the above requirements, if a beach restoration project (such as Plan C) were implemented, local interests would be required to furnish the following assurances:

a. Contribute in cash, 30 to 50 percent of the beach restoration and nourishment costs (depending on cost sharing policy in effect at the time of construction) and all beach restoration and nourishment costs in excess of the Federal expenditure limitation of $1,000,000 which includes Federal study, design, construction, and periodic beach nourishment costs.

b. Provide, without cost to the United States, all necessary lands, easements, rights-of-way, and relocations required for construction of the beach restoration features, including that required for periodic nourishment.

c. Carry out the annual beach nourishment program for the 50-year life of the project with the only cost to the United States being the annual reimbursement to the town of Harborcreek, PA, of 50 to 70 percent of the city's expenditure thereof, depending on cost sharing policy in effect at the time of the signing of the local cooperation agreement, subject to the availability of funds and the Federal expenditure limitation of $1,000,000.

d. Provide and maintain necessary access roads, parking areas, and other public use facilities open and available to all on equal terms.

e. Assure that water pollution from point sources in the park that would affect the health of the bathers will not be permitted.

DISCUSSION

36. The analysis done for this report shows conclusively that there is a Federal interest in restoring the beach at Harborcreek, and there is a Federal interest in providing a navigation improvement project.

37. Selection of the recommended plan must be made recognizing that the criteria of the two laws must be met individually. Good planning principles demand that a plan be chosen that maximizes net benefits. Plan C satisfies both planning principles and legal requirements because the components of that plan are shared between navigation and beach restoration, and each is incrementally justified.

CONCLUSION

38. Based on the preliminary analysis in this report, there is ample justification for Federal involvement in a project at Shades Beach that includes beach restoration and navigation improvements, and as such,detailed studies are warranted.

RECOMMENDATION

39. I recommend that $35,000 be provided under Section 103 of the 1962 River and Harbor and Act and $35,000 be provided under Section 107 of the 1960 River and Harbor Act to prepare a Reconnaissance Report of navigation and

beach restoration at Harborcreek, provided that the township of Harborcreek or some other governmental body assures the Corps in writing that they intend to meet the requirements in Paragraphs 34 and 35 of this report. PB-6 forms identifying elements of work to be performed during the Reconnaissance Studies are attached. Because of the relatively low cost of the project, I recommend that the Reconnaissance Reports serve as the decision document, from which we proceed directly to preparation of Plans and Specifications.

FOR DANIEL R. CLARK
Colonel, Corps of Engineers
District Commander

70,000

SECTION 103 AND 107
INITIAL APPRAISAL REPORT
HARBORCREEK, PENNSYLVANIA

APPENDIX D

PRELIMINARY ENVIRONMENTAL COMPLIANCE SUMMARY

SECTION 103/107 INITIAL APPRAISAL REPORT
HARBORCREEK, PENNSYLVANIA

PRELIMINARY ENVIRONMENTAL COMPLIANCE SUMMARY

D1. As indicated by the Federal objective of water and related land resources project planning; the project must be consistent with protecting the Nation's environment, pursuant to national environmental statues, applicable executive orders, and other Federal planning requirements. Compliance with environmental statutes (to date) is as follows:

a. Preservation of Historical Archeological Data Act of 1974 (16 USC et seq.); National Historic Preservation Act of 1966, as amended, 16 USC 470 et seq.; Executive Order 11593, Protection and Enhancement of the Cultural Environmental, 13 May 1971 - Project coordination was initiated with the U.S. Department of the Interior and the Pennsylvania Historical and Museum Commission - Bureau for Historic Preservation via 2 July 1984 and 28 June 1984 letters, respectively. The Pennsylvania Historical and Museum Commission indicated in their 16 August 1984 letter response that there is a high probability that archeological resources may be affected by this project and that a survey or limited testing of the area should be undertaken to locate potentially significant archeological resources. Further investigation and coordination will be conducted in the next phase of study.

b. Clean Air Act, as amended, 42 USC 7401 et seq. - Project coordination was initiated with the U.S. Environmental Protection Agency and the Pennsylvania Department of Environmental Resources vis 2 July 1984 and 6 July 1984 letters, respectively. Further coordination will be conducted in the next phase of study. No significant adverse impacts to air quality would be expected with project implementation.

c. Clean Water Act of 1977 (Federal Water Pollution Control Act Amendments of 1972) 33 USC 1251 et seq. - Project coordination was initiated with the U.S. Environmental Protection Agency and the Pennsylvania Department of Environmental Resources - Bureau of Water Quality Management via 2 July 1984 and 6 July 1984 letters, respectively. The Pennsylvania Department of Environmental Resources indicated some concern pertaining to downdrift shore erosion and sedimentation, and indicate that clean materials should be used for construction and beach nourishment (27 July 1984 - Telecom). Further investigation and coordination will be conducted in the nest phase of study. A Section 404(b)(1) Public Notice and Evaluation Report would need to be prepared and coordinated before project construction. A Section 401 State Water Quality Certificate or waiver thereof, would need to be obtained before project construction.

d. Coastal Zone Management Act, as amended, 16 USC 1451 et seq. -Project coordination was initiated with the Pennsylvania Coastal Zone Management (CZM) Office via letter dated 2 July 1984. The Pennsylvania CZM Office desires recreational development, but expressed some concerns regarding erosion to the east of the project site. A consistency compliance evaluation report would need to be prepared and coordinated with the Pennsylvania CZM Office before project construction.

k. National Environmental Policy Act, 42 USC 470a, the seq. - Alternative plans are developed and evaluated in accordance with environmental considerations as set forth by this act as promulgated by the Department of the Army's: Principles and Guidelines; ER 200-2-2 Environmental Quality - Policies and Procedures for Implementing NEPA; and COE Section 122 Guidelines Requirements of the Act are accomplished via the Corps' planning process.

l. River and Harbor Act (33 USC 401 et seq.) - Requirements of the Act are fulfilled via the Corps' permit and planning authorities.

m. Watershed Protection and Flood Prevention Act (16 USC 1001 et seq.) - No requirements for Corps activities. (Requirements of the Act fulfilled by the Corps planning actions.) Project coordination was initiated with the U.S. Department of Agriculture - Soils Conservation Service via a 2 July 1984 letter. Coordination will continue in the next phase of study. Reference S. also.

n. Wild and Scenic Rivers Act (16 USC 1271 et seq.) - No listed wild and scenic rivers are located in the project area. Not applicable in this case.

o. Executive Order 11593, Protection and Enhancement of the Cultural Environment - Reference a.

p. Executive Order 11988 Flood Plain Management, 24 May 1977 - The Federal project would comply with area flood plain management policies. The project would not alter application of any area flood insurance or flood plain management policies.

q. Executive Order 11990, Protection Wetlands, 24 May 1977 - To date, no wetland areas have been identified in the immediate project area. Reference Draft National Wetlands Inventory Maps - 1983 (Harborcreek, PA, Quad). Federal action would not affect any wetland, nor would it alter application of any wetland protection policies.

r. Executive Order 12114, Environmental Effects Abroad of Major Federal Actions, 4 January 1979 - Not applicable for this study.

s. Executive Memorandum Analysis of Impacts on Prime and Unique Farmlands in EIS, CEQ Memorandum, 30 August 1976 - Project coordination was initiated with the U.S. Department of Agriculture - Soil Conservation Service - State Conservationist via 2 July 1984 letter. No agricultural farmland or prime or unique or important soils were identified in the immediate project vicinity. Referenced: Erie County, PA, Prime and Important Farmlands Map - 1978; Soil Survey 1960, Erie County, PA; Important Farmlands of Erie County, PA (Soils Brochure); from the U.S. Department of Agriculture - Soils Conservation Service.

D2. State and Local - Project coordination was initiated with State and local agencies as identified in Paragraph 25. The project must be consistent with State and local environmental legislation and local land use plans.

DESIGN ANALYSIS

prepared by the

U.S. ARMY CORPS OF ENGINEERS

DESIGN ANALYSIS

Introduction

The following presents the preliminary design analysis for the proposed breakwaters intended to form a sheltered boat launching facility and offshore breakwater to stabilize a beach at Shades Beach Park in Harborcreek, Pennsylvania. The breakwaters protecting the boat ramp were designed to withstand a 10-year wave 20-year lake level storm event with the crest height set to maintain acceptable conditions during which craft are assumed to operate. The offshore breakwater is designed to overtop in order to preclude tombolo formation.

Design Water Level (DWL)

a. Instantaneous Maximum - Frequency Information

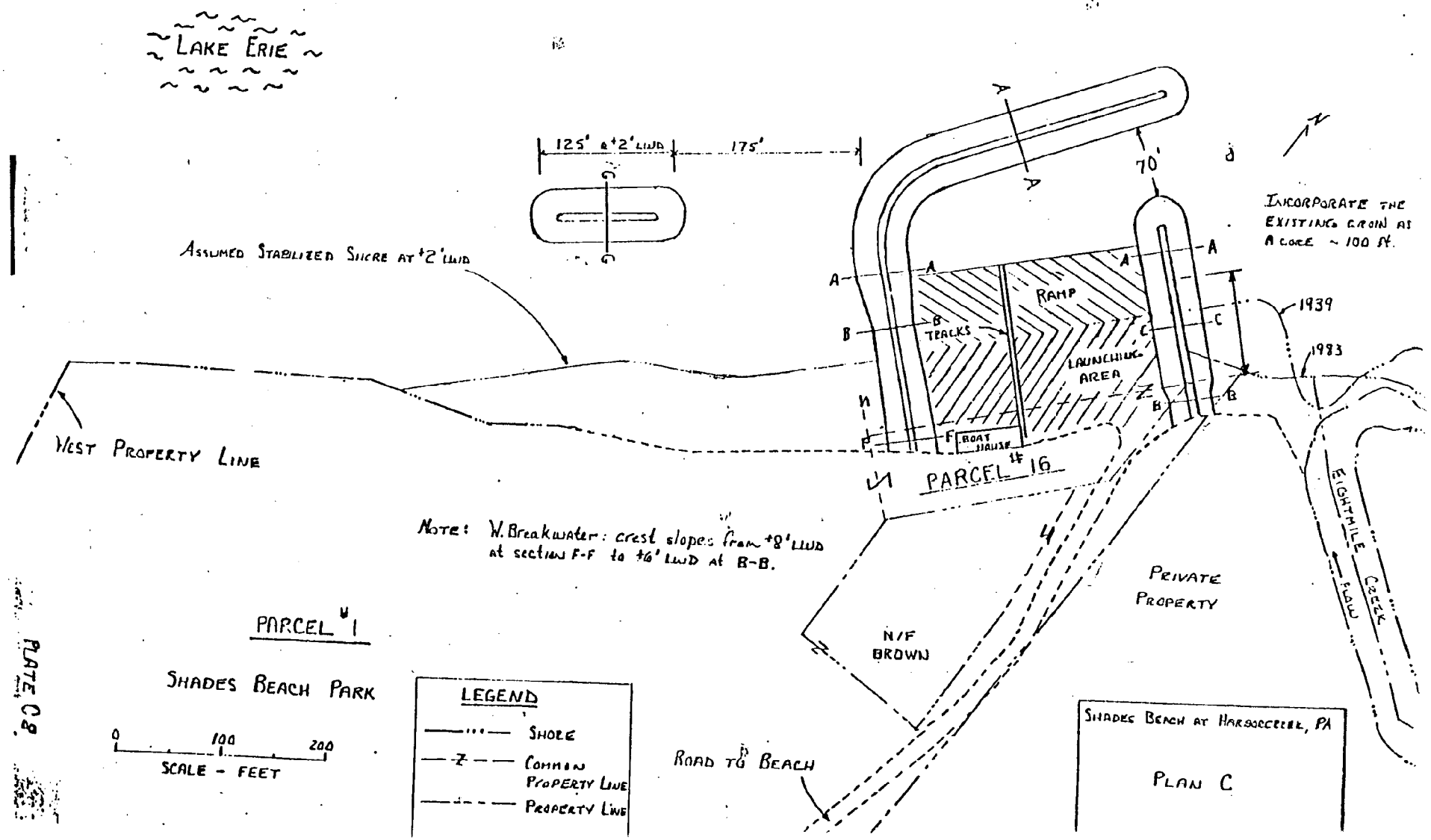
Open coast elevation - frequency curve were develope along the United States' shore of Lake Erie (reference 4) Harborcreek, Pa is located in reach "J" and experiences the following levels.

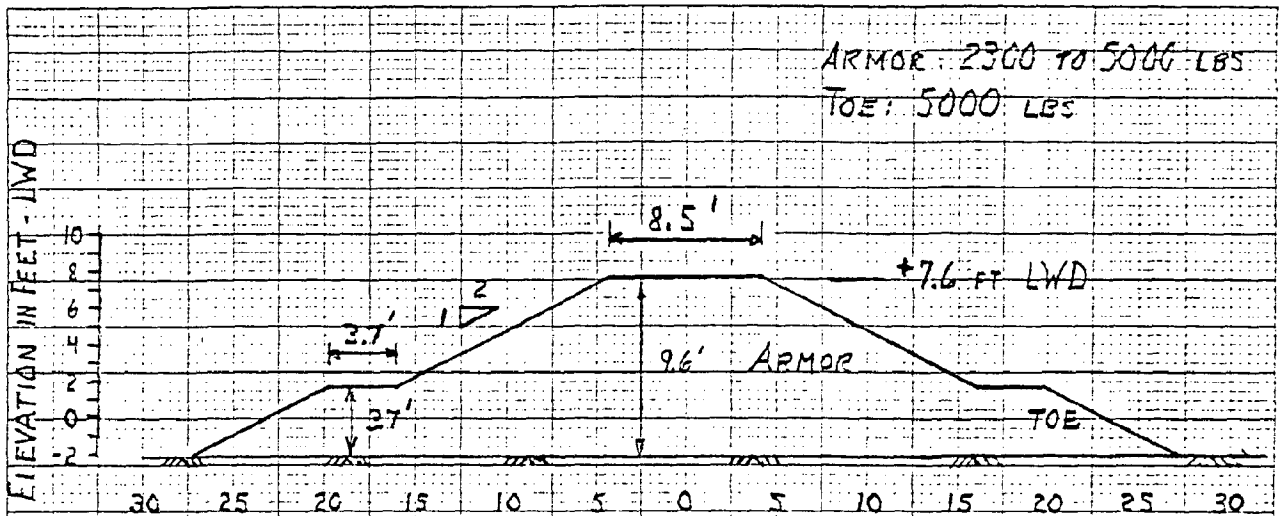
10-year : 574.8 feet IGLD ($^{+}$6.2 ft LWD)
20-year : 575.2 feet IGLD ($^{+}$6.6 ft LWD)

b. Monthly Lake Level - Duration Curve

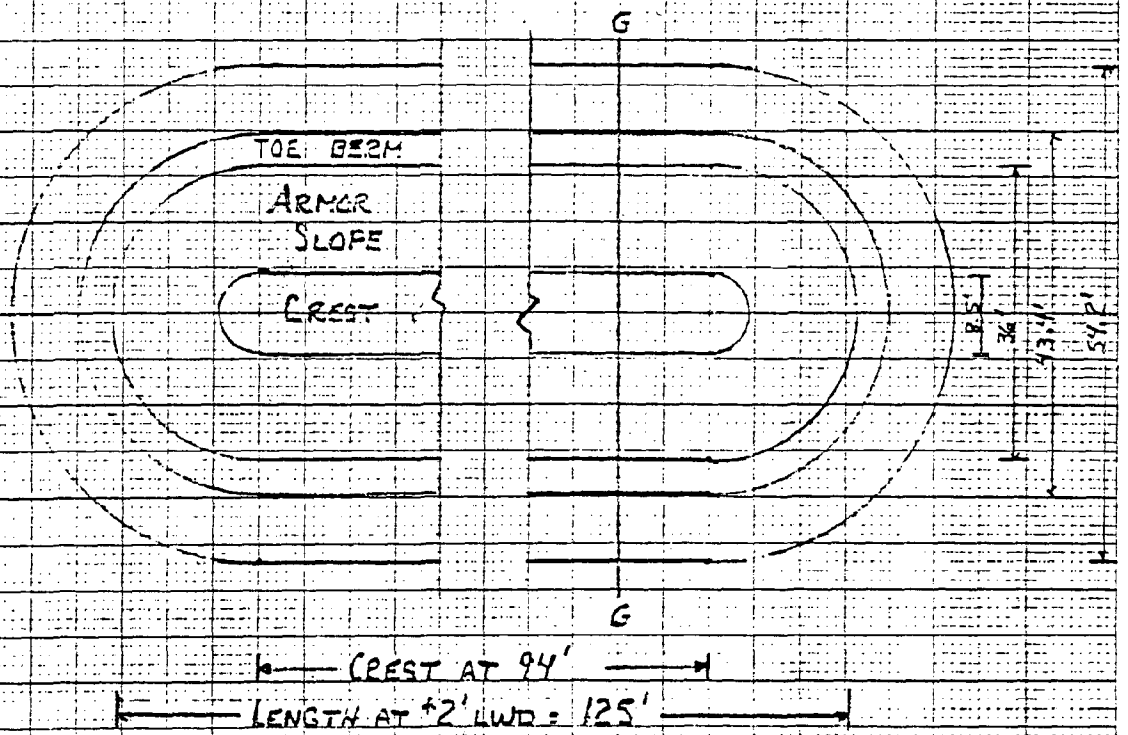
A monthly lake level - duration curve for Lake Erie based upon average monthly lake levels for the period 1900-19 and for the months April through December is presented on plate 11. This curve was used to assist in evaluating

4 References are listed in section 9.


LAKE ERIE
125' @ +2' LWD
175'
70'
INCORPORATE THE EXISTING GROIN AS A CORE ~ 100 FT.
ASSUMED STABILIZED SLOPE AT +2' LWD
RAMP
TRACKS
LAUNCHING AREA
BOAT HOUSE
1939
1983
WEST PROPERTY LINE
PARCEL #6
NOTE: W. Breakwater: crest slopes from +8' LWD at section F-F to +6' LWD at B-B.
PARCEL #1
SHADES BEACH PARK
PRIVATE PROPERTY
N/F BROWN
EIGHTMILE CREEK
FLOW
ROAD TO BEACH
0 100 200
SCALE - FEET
LEGEND
SHORE
COMMON PROPERTY LINE
PROPERTY LINE
SHADES BEACH AT HARBORCREEK, PA
PLAN C
PLATE C8



SECTION G-G



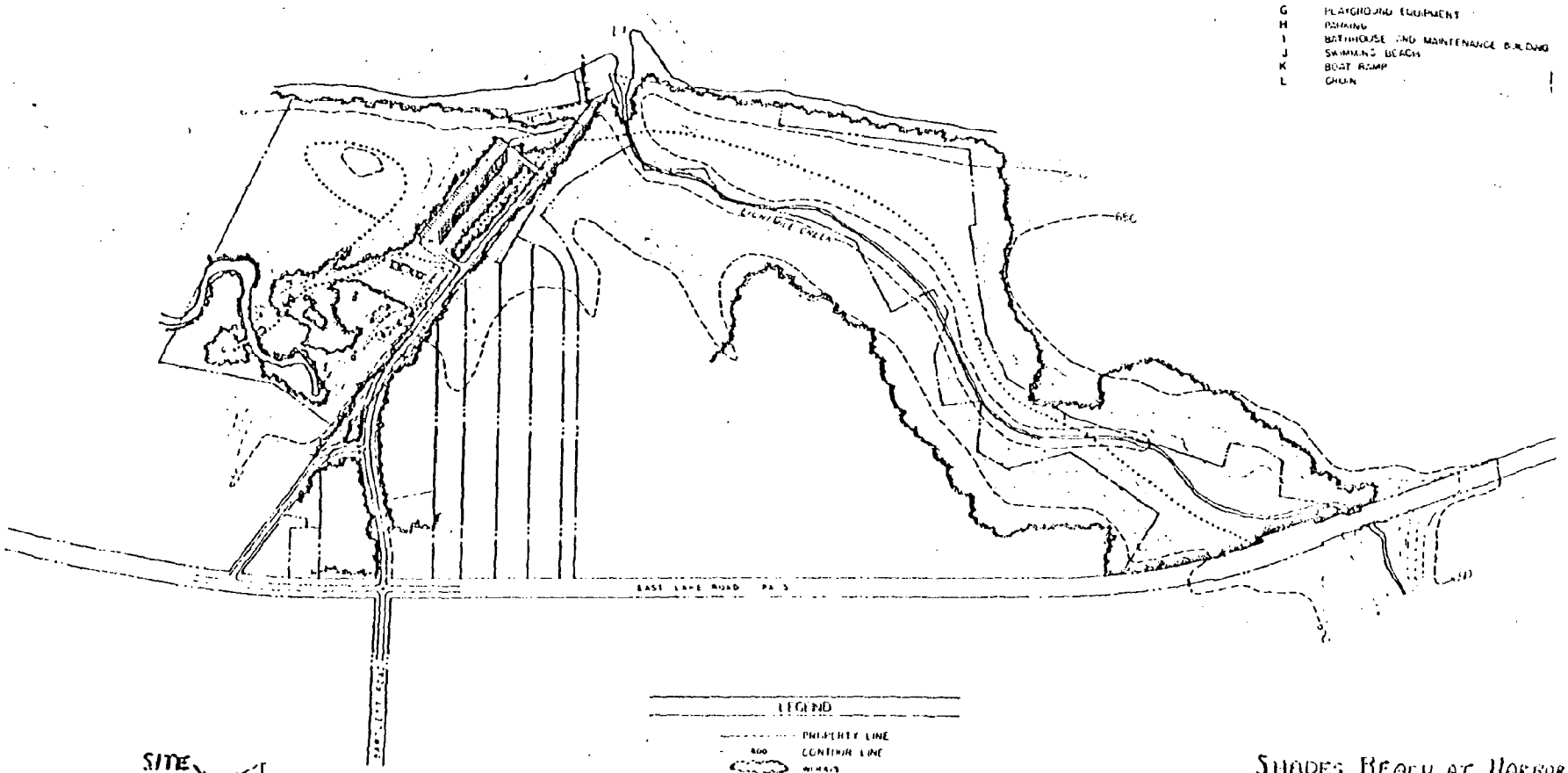
OFFSHORE BREAKWATER PLAN

PLAN SCALE
0 10 20
FEET

SHADES BEACH AT HARBORCREEK
PENNSYLVANIA

OFFSHORE BREAKWATER
PLAN AND SECTION

PLATE C10



SHADES BEACH AT HARBORCREEK
PENNSYLVANIA

SHADES BEACH PARK MAP

PLATE 01

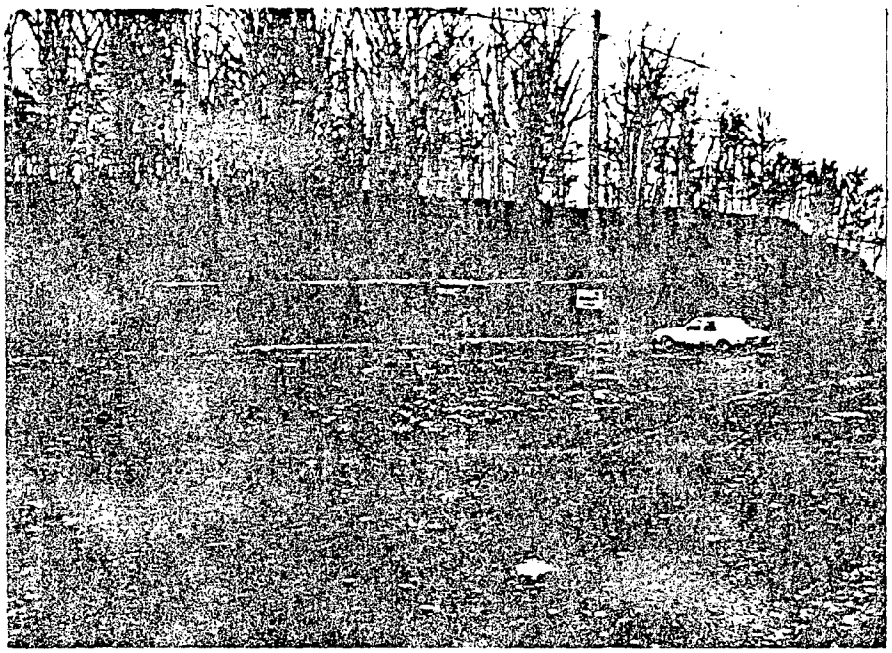


PHOTO 1 : PARKING AREA IN PARK

Note the railroad shanties in lot - these are described in Plan B.

PHOTO 2 - Road to Beach

Photo 3 - Groin (Note that last 20' was snapped off during winter. Town intends to repair it.)

Photo 4 - Boat house and Beach

the crest height of the breakwater sheltering the boat ramp and the average annual usage based upon the draft requirements of the fleet.

Design Water Depth, d_s

The design water depth, used during the stone size determination is the difference between the elevation of the structure toe and the design lake level. For this study, the lake bottom was assumed to be composed of shale, and based upon the Harborcreek U.S. quad map the lake bottom is at elevation -2 feet LWD. This result in the following design depths.

10-year: 6.2' - (-2') : 8.2 feet
20-year: 6.6' - (-2') : 8.6 feet

The above depths will be used to evaluate all of the structures.

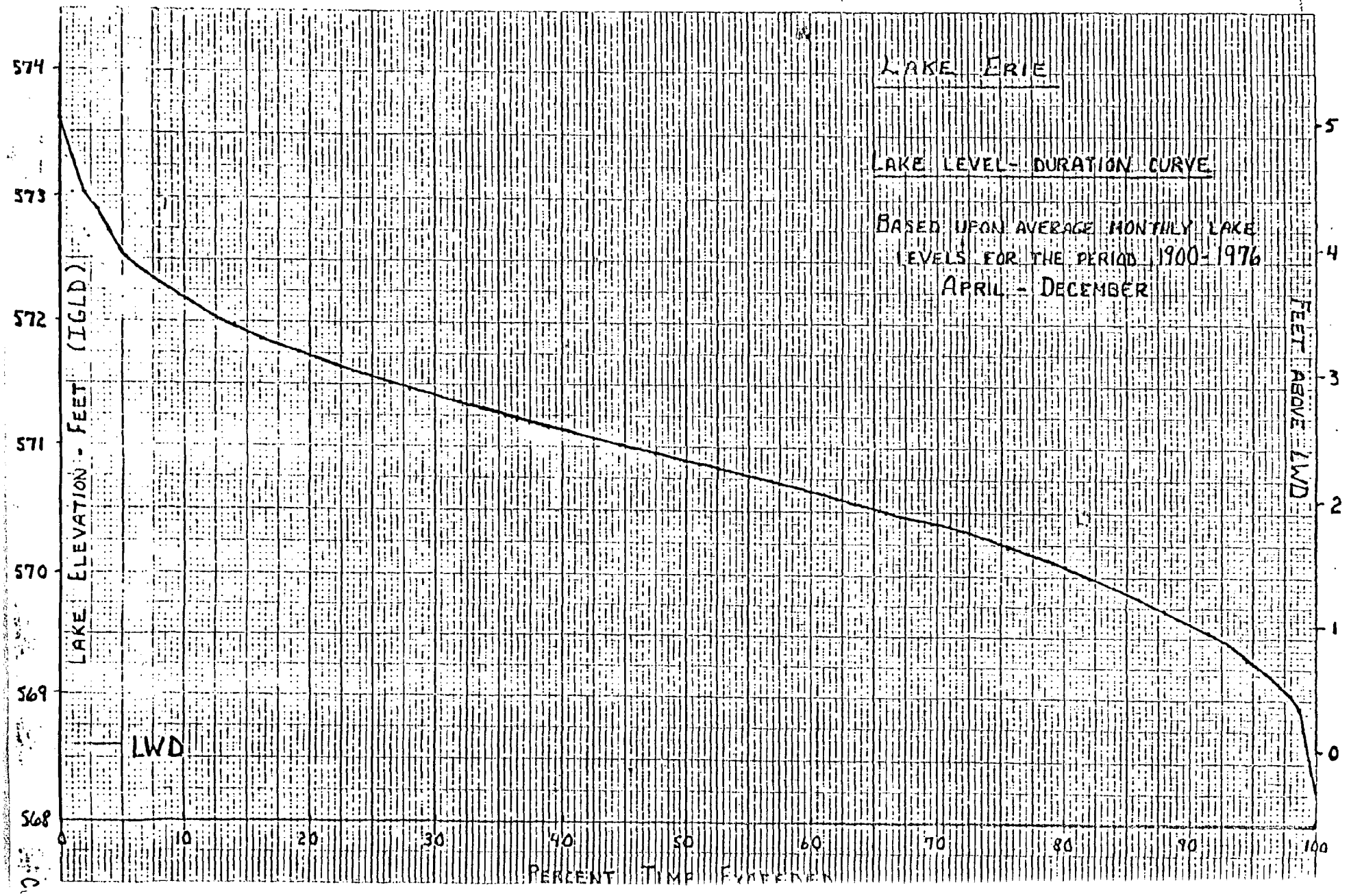
Design Deepwater Waves (H_o, T_o)

In general, the shore at Harborcreek is subject to wave activity spanning approximately 152°, as it is partially sheltered by Presque Isle. Three wave angle classes can be defined as viewed by an observer on shore as; and shown on plate 12.

(1) Angle Class 1 - Mean wave approach angle greater than 30 degrees to the right of a normal to shore.

(2) Angle Class 2 - Mean wave approach angle within 30 degrees to either side of a normal to shore.

(3) Angle Class 3 - Mean wave approach angle greater than 30 degrees to the left of a normal to shore.


LAKE ERIE
LAKE LEVEL- DURATION CURVE
BASED UPON AVERAGE MONTHLY LAKE LEVELS FOR THE PERIOD 1900-1976
APRIL - DECEMBER
LAKE ELEVATION - FEET (IGLD)
FEET ABOVE LWD
PERCENT TIME EXCEEDED
LWD
574
573
572
571
570
569
568
5
4
3
2
1
0
0
10
20
30
40
50
60
70
80
90
100

The normal to shore at Harborcreek is taken as 300 degrees counter-clockwise from East, and is shown on plate 12.

Wave information for the Great Lakes has been developed by a numerical hindcast model utilizing historical wind data (reference 5). Significant wave heights were calculated for 5-, 10-, 20-, 50-, and 100-year return periods along with the corresponding significant wave period. The information is presented for the four seasons of the year and is separated into the three approach angles relative to the shore as previously discussed.

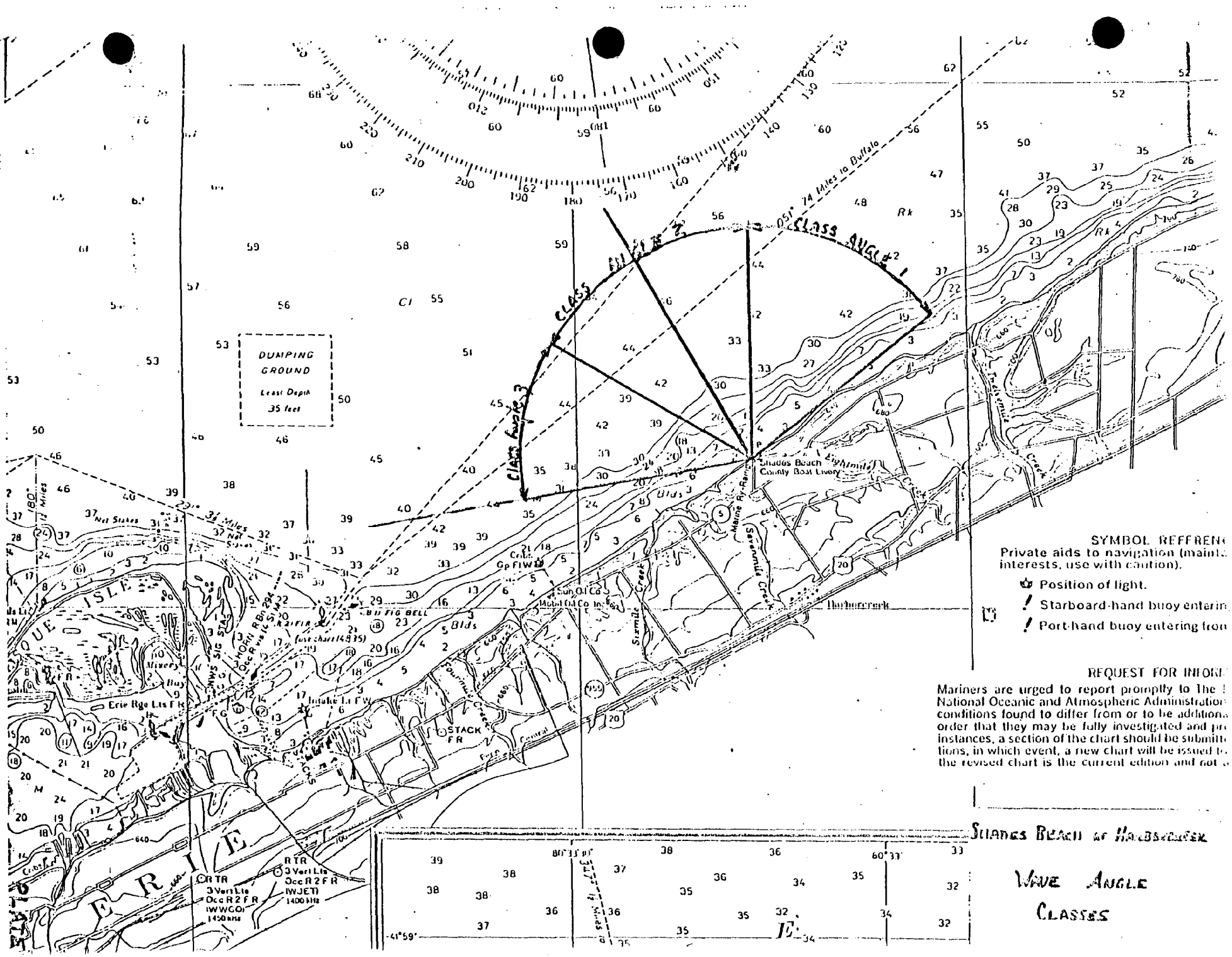
The annual wave height-frequency curve for each class angle was determined by combining the seasonal wave height-return period curves using the inclusion-exclusion probability formula:

$$P(A_1 \cup A_2 \cup A_3 \cup A_4) = S_1 + S_2 + \cdots + (-1)^{N+1} S_N$$

where $A_1, \ldots, A_N$ are events and

$$S_k = \sum_{i_1 < i_2 \cdots i_k}^{N} P(A_{i_1} \cap A_{i_2} \cap A_{i_3} \cap \cdots \cap A_{i_k}), \quad k = 1, \ldots, N$$

With Shades Beach Park at Latitude 42.19°, Longitude 79.96°, Grid 19, East of Erie Pa, is the appropriate wave table to use (ref 5). The annual wave height and wave period-frequency curves by class angle are shown on plates C13 and C14 respectively.



SYMBOL REFEREN
Private aids to navigation (maint
interests, use with caution).

Position of light.

Starboard-hand buoy enterin

Port-hand buoy entering fron

REQUEST FOR INFORM
Mariners are urged to report promptly to The
National Oceanic and Atmospheric Administration
conditions found to differ from or to be addition
order that they may be fully investigated and pr
instances, a section of the chart should be submitt
tions, in which event, a new chart will be issued t
the revised chart is the current edition and not

SHADES BEACH OF HARBORCREEK

WAVE ANGLE CLASSES

K&E PROBABILITY X 90 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 8000

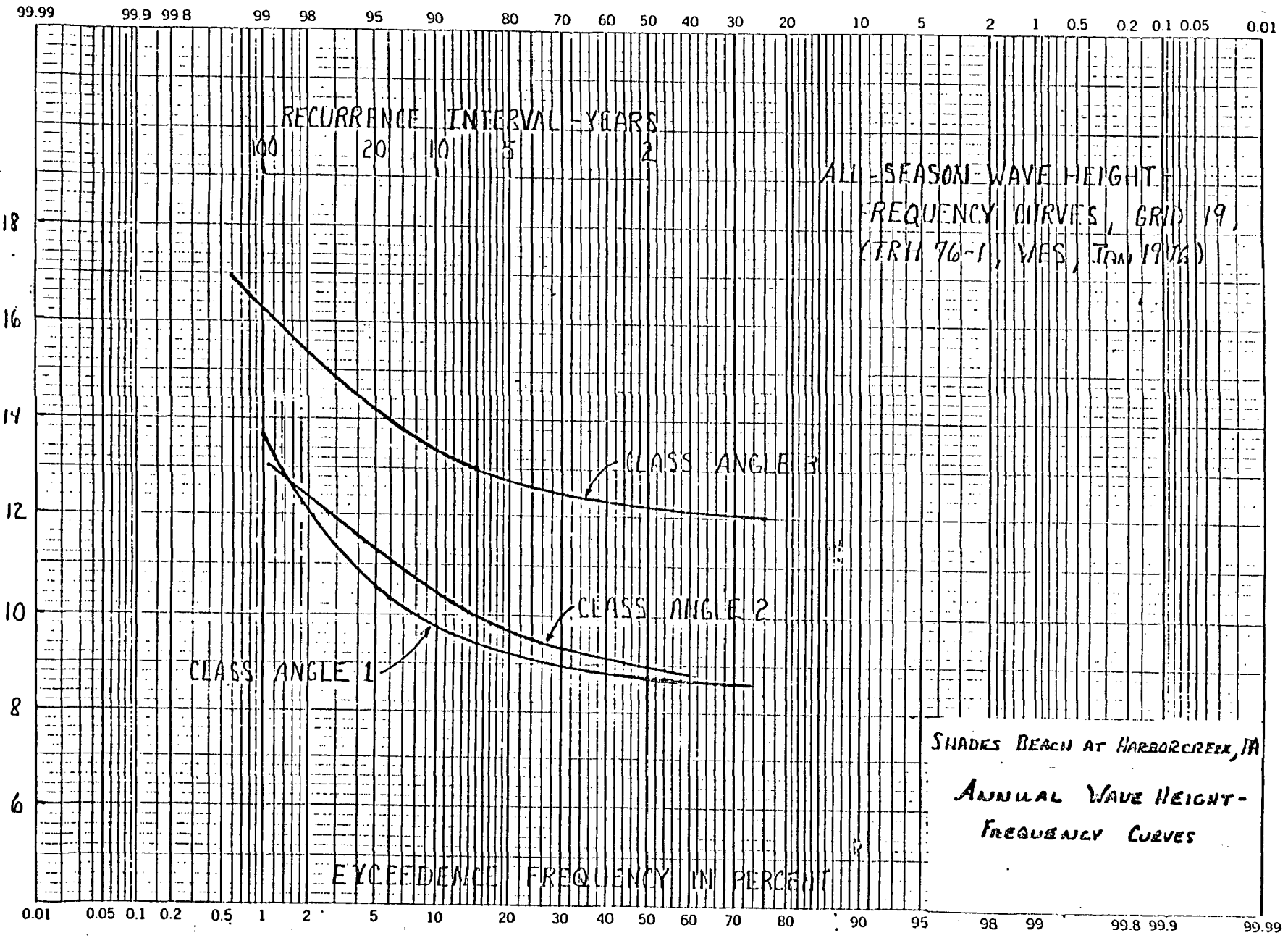


PLATE C13

K+E PROBABILITY X 90 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 8000

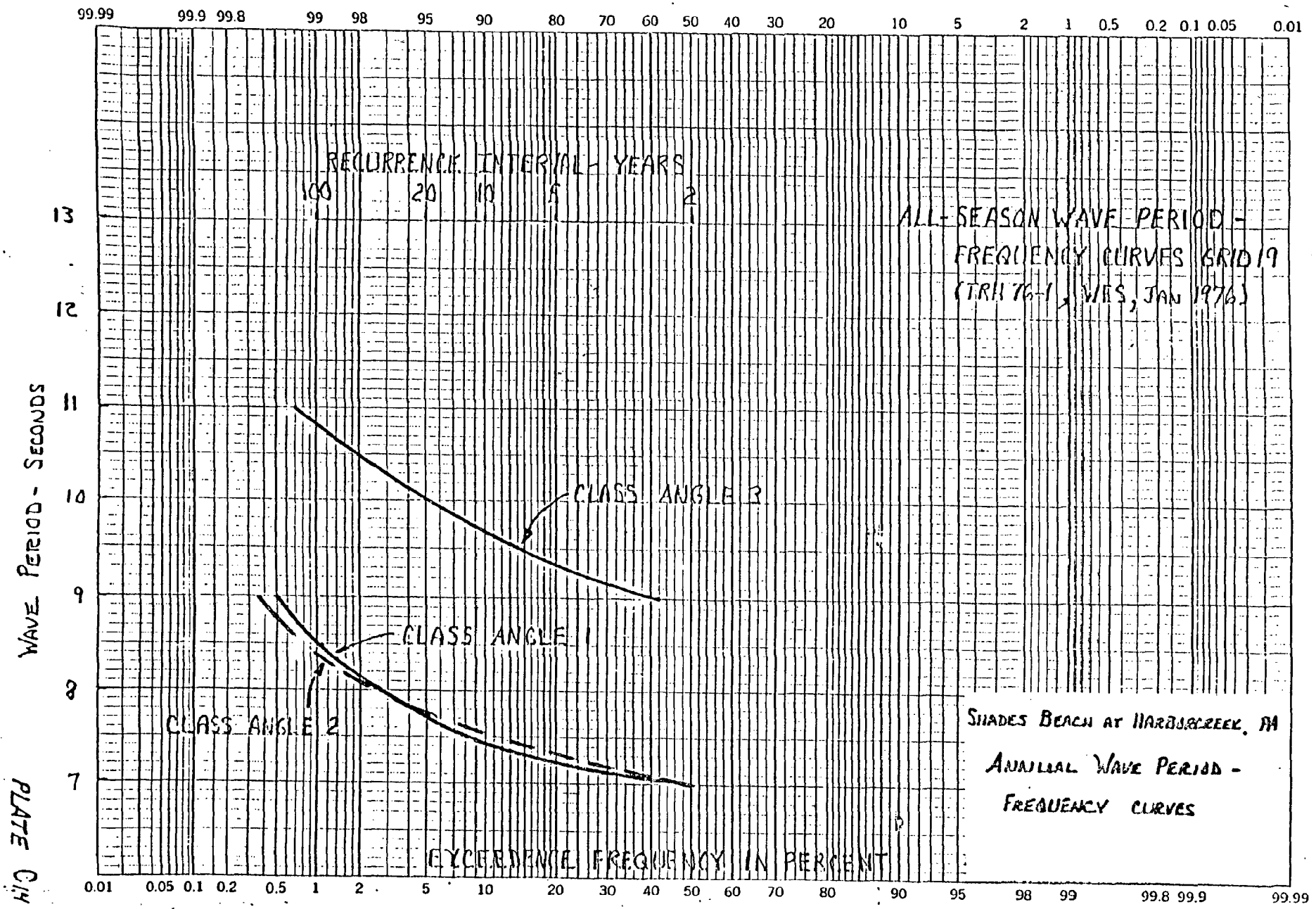


PLATE C14

The annual 10- and 20-year deep wave wave heights and period are summarized in table C2

Table C2 - Deepwater Waves

Angle Class	10-Year Recurrence Interval		20-Year Recurrence Interval	
	Wave Height H_o - feet	Wave Period T_o - sec	Wave Height H_o - feet	Wave Period T_o - sec
1	9.8	7.4	10.6	7.7
2	10.4	7.5	11.2	7.8
3	13.4	9.7	14.2	10.0

Design Waves (H_{sig})

This section describes the determination of the incident significant waves at the structure used to size the stone. Refraction coefficients (K) were calculated using figure A-1 in reference 6. A value of 40 was assumed for S^* which defines the variation of energy level with wave direction for wind waves. Table C3 summarizes the steps used to determine the refraction coefficients and the unrefracted wave heights, H_o.

The nearshore irregular wave heights for the 10- and 20-year incident waves and 20- and 10-year lake levels were computed at the structure. The design curves from Appendix B of reference 6 were used to evaluate the effect of shoaling, with the wave height at the structure a function of the design depth, unrefracted deepwater wave steepness, and lake bottom slope. The method is intended for open sections of coast with continuous shallowing depth contours as found at Harborcreek. Table C4 is a summary of parameters used to determine the incident waves, with the largest incident wave selected as the design wave.

TABLE C3 REFRACTION COEFFICIENTS AND UNREFRACTED DEEPWATER WAVE HEIGHTS

SECTION	DESIGN LEVEL	DESIGN WAVE	ANGLE CLASS	α_o DEGREES	T_s SECONDS	d_s FEET	d/gT^2	K_r	H_o FEET	$H'_o = K_r H_o$ FEET
ALL	10-YR	20-YR	1	30	7.7	8.2	.0043	.86	10.6	9.1
			2	0	7.8	"	.0042	.91	11.2	10.2
			3	30	10.0	"	.0025	.85	14.2	12.1
	20-YR	10-YR	1	30	7.4	8.6	.0049	.86	9.8	8.4
			2	0	7.5	"	.0047	.91	10.4	9.5
			3	30	9.7	"	.0028	.85	13.4	11.4

TABLE C4 DETERMINATION OF INCIDENT WAVE HEIGHT

SECTION	DESIGN LEVEL	DESIGN WAVE	ANGLE CLASS	H'_o FEET	d_s FEET	T SECONDS	$L_o = 5.12T^2$ FEET	H'_o/L_o	d/H'_o	SLOPE	H_{sig}/H'_o	H_{sig} FEET
ALL	10-YR	20-YR	1	9.1	8.2	7.7	303.6	.030	.90	.01	.63	5.7
			2	10.2	"	7.8	311.5	.033	.80	"	.52	5.3
			3	12.1	"	10.0	512.	.024	.68	"	.51	6.2
	20-YR	10-YR	1	8.4	8.6	7.4	280.4	.030	1.02	.01	.70	5.9
			2	9.5	"	7.5	288.0	.033	.91	"	.63	5.9
			3	11.4	"	9.7	481.7	.024	.75	"	.56	6.4*

The analysis in table 4 indicates that in general the largest incident waves occur as a result of the 10-year angle class 3 significant deepwater waves superimposed on the 20-year design water level. The selected wave is indicated by an asterick (*) in table 4.

Breaking Wave Conditions

Tables C5 and C6 present the analysis to determine the range of depths over which breaking may occur. Figures 7-2 and 7-3 of reference 7 were used in calculating the breaking depth range. Since the design water depth, ds, at the toe of the structure is less than the range indicated, the design incident wave is considered to be a breaking wave.

Table C5 - Breaking Wave Height, (H_b)

H'_o - ft	T_s sec	H_{sig} feet	Slope	H'_o/gT^2	H_b/H'_o	H_b feet
11.4	9.7	6.7*	.01	.0038	1.15	13.1

Table C6 - Depth Range for Breaking Wave

H_b/gT^2	$(d_b/H_b)_{max}$	$(d_b/H_b)_{min}$	$d_{b\,max}$	$d_{b\,min}$	d	Wave Type
.0043	1.52	1.21	19.9	15.9	8.6	Breaking

Stone Size Computations; General

In general, the breakwaters were designed as rubblemound structures following procedures in the Shore Protection Manual (reference 7). A portion of the East Breakwater incorporated the existing concrete groin, a a section of the West Breakwater on Plan B has a concrete core. The stone is assumed to have a density of 155 pounds/ft^3 and were designed to be stable against the design incident wave heights, H_{sig}.

Stone sizes were calculated using Hudson's formula (reference 7) with the stability coefficient, K_D, selected from table 7-7. Hudson's formula is:

$$W = \frac{w_r H^3}{K_D (S_r - 1)^3 \cot \theta}$$

where W = weight of armor unit in primary cover
w_r = unit weight of armor unit (155 p.c.f.)
H = incident design wave height
K_D = stability coefficient
S_r = specific gravity of armor stone
$\cot \theta$ = structure side slope

Since the lake bottom is assumed to be rock and that the final crest height is low, underlayers and bedding will not be necessary.

Utilizing the armor weight, W, the range of stone size for the armor and toe are determined as follows:

Armor: 0.9 W to 2.0 W
Toe 2.0 W

Layer Thickness Computations, General

The thickness of the armor and toe layers were computed by

$$r = N K_\Delta \left(\frac{W}{W_r}\right)^{1/3}$$

where r = layer thickness (feet)
N = number of stones comprising the layer
= 2 (minimum) for layer thickness
= 3 for armor crest width
K_Δ = layer coefficient
= 1.15 for 2 or 3 layers of rough quarry stone
W = individual armor weight
W_r = unit weight of stone (155 pcf)

Stone Size: Head Sections

Note that all structures are assumed to rest on lake bottom at elevation -2

Armor: H = 6.4'
cotθ = 2.0 for structure head
K_D = 2.5 " " "

$$W = \frac{155 \text{ pcf} \times 6.4^3}{2.5\,(1.48)^3 \times 2.0}$$

= 2507 pounds

Range: 0.9W - 2.0W
: 0.9(2507) - 2.0(2507)
: 2256 - 5014
say 2300 to 5000 pounds

Armor 2-layer thickness

$r = 2(1.15)\left(\frac{2507}{N^3}\right)^{1/3}$

$= 5.8'$

Armor 3-layer thickness

$r = 3(1.15)\left(\frac{2507}{N^3}\right)^{1/3}$

$= 8.7$ feet

TOE:

Weight $= 2W$

$= 5000$ pounds

Size; $r = 1(1.15)\left(\frac{5000}{165}\right)^{1/3}$

$= 3.7'$

Stone Size: Trunk Sections

Again, in the absence of bathymetric information, the breakwaters were assumed to rest on a lake bottom at -2 ft LWD. It may actually be less, which would result in smaller stone sizes than determined herein. This should be checked in the next study phase.

Armor: $H = 6.4'$

$\cot\theta = 1.5$ for structure trunk

$K_D = 3.5$ " " "

$W = \frac{155 \times 6.4^3}{3.5(1.48)^3 \times 1.5}$

$= 2387$ pounds

Armor range : 0.9 W - 2.0 W

$0.9(2387) - 2.0(2387)$

$= 2148 - 4774$

Since this is close to size of armor in head section, adopt same size: 2300 to 5000 pounds

Remaining calculations will be the same as for head section.

Note: To keep sand from migrating through the W. Breakwater trunk section, filter cloth will have to be used. Also the breakwaters sheltering the boat ramp will be brought back to the bluff so that it will not be outflanked.

Concrete Core: PLAN B

As indicated in paragraph 5, the Town of Harborcreek purchased 27 concrete shell warming sheds with the dimensions 6'x6'. The weight of an individual shed filled with concrete would be:

On Land: $(6' \times 6' \times 8') \times 150\ ^{lb}/_{ft^3} = 43200$ pounds

$= 21.6$ tons

Submerged in Water: $(6' \times 6' \times 8') \times (150 - 62.4)$

$= 25228.8$ pounds

$= 12.6$ Tons

Due to the excessive weight, they will have to be filled in place. All openings (small window - 1.5'x1.5' + hole for chimney) except for the doorway will have to be closed. The sheds will be floated into position and sunk (by rotating slightly to allow water to enter doorway) with the doorside up. Concrete will be pumped in through doorway.

The quantity of concrete needed will be

$= (6' \times 6' \times 8') \times 1 yd^3/27 ft^3 \times 27$ houses

$= 288\ yd^3$

The total length of core, with the slots placed end to end will be:

$8' \times 27$ houses $= 216$ feet

Crest Height - Breakwaters Sheltering Boat Ramp

The height of the breakwaters were set to minimize wave conditions in front of the boat ramp during expected times of usage as discussed in paragraph 4. The wave runup on a rubblemound structure was determined using (reference 8):

$$R = H\left[\frac{0.692\,\xi}{1+0.504\,\xi}\right]$$

where R = wave runup (feet)
H = incident wave height - feet
ξ = surf parameter
$= \tan\theta / \sqrt{H/L_o}$
L_o = deepwater wave length
$\tan\theta$ = structure side slope

The relation between the height of the breakwater above stillwater level, the incident wave, and the transmitted wave given by the Cross-Sollitt equation:

$$H_{s_i} = R(1.04 - {}^{H_T}/_{0.54 H_i})$$

where H_{s_i} = height of breakwater above SWL
R = wave runup
H_T = transmitted wave height
H_i = incident wave heights

It was assumed that a 3.0 foot wave at the structure could occur for the entire range of lake levels. The approximate period of this wave is 4.9 seconds. (Note: The period is approximate because this is the period for a 3' deepwater wave. The actual period could be determined by estimating a period, working backwards through the GODA curves to obtain the deepwater wave heights and comparing the deepwater wave heights & period with those in reference 5. This is repeated until the estimated period for the deepwater wave heights matches reference 5). Since this is an initial appraisal report the present method is acceptable.

$$\gamma = {\tan\theta}/{\sqrt{H/L_o}}$$

$$= {1/2}/{\sqrt{3.0/5.12 \times 4.9^2}} = 3.2$$

$$R = H\left[\frac{0.692\gamma}{1+0.504\gamma}\right]$$

$$= 3.0\left[\frac{0.692 \times 3.2}{1+0.504 \times 3.2}\right]$$

$$= 3.0\ (.85)$$

$$= 2.5 \text{ feet}$$

Determine the required crest height for no overtopping for various lake levels (average monthly).

Table C6

① Percent time exceeded	② Lake level ft-LWD	③ Runup feet	Crest height - ft LWD = ② + ③
"0"	~5.0	2.5	7.5
5	3.95		6.45
10	3.6		6.1
30	2.8		5.3
50	2.3		4.8
70	1.8		4.3
90	1.0		3.5
100	-.3		2.2

Determine the required crest heights for 1' transmitted wave for various lake levels.

$$H_t = R(1.04 - {}^{H_T}/_{54 H_i})$$
$$= 2.5(1.04 - {}^{1.0}/_{54(3.0)})$$
$$= 1.06 \text{ say } 1.1 \text{ feet}$$

Table C7 - Required Crest Heights for 1 Foot Transmitted Wave

Percent time Exceeded	Lake Level ft-LWD	Runup feet	Crest heights - ft LWD = ② + ③
0	5.0	1.1	6.1
5	3.95		5.05
10	3.6		4.7
30	2.8		3.9
50	2.3		3.4
70	1.8		2.9
90	1.0		2.1
100	-.3		0.8

Table 6 and 7 has been plotted on plate C15. This curve presents the crest height necessary to allow no overtopping or to allow a 1.0 foot transmitted wave over the breakwater for various lake levels. With the breakwater selected as "3 stones high", a crest height of:

$$8.7' + (-2' \text{ LWD}) = +6.7' \text{ LWD}$$

Say +6.5 ft LWD results.

At this crest height overtopping from a 3.0 foot incident wave will not occur until occurrence of a 5.0 % monthly lake level. However the interna wave (in harbor) will never exceed 1.0 feet during the occurrence of the 3.0 foot wave. Since the 3.0 foot incident wave (outside harbor) is considered the maximum wave boatess would be willing to go out in, interior waves will not be a problem during harbor usage. During future studies, it is suggested that wave transmission through the breakwater and diffraction effects be investigated.

Although the boat launching facility will not be used during occurrence of the 10-year wave/20-year lake level, the transmitted wave which would occur was determined. With

$$H_i = 6.4', \quad T = 9.7 \text{ seconds}, \quad DWL = +6.6 \text{ ft LWD}$$

$$R = H\left(\frac{.6923}{1+.504S}\right)$$

$$= 6.5\left(\frac{.6923(4.34)}{1+.504(4.34)}\right)$$

$$= 6.0'$$

$$S = \frac{\tan\theta}{\sqrt{H/L_o}}$$

$$= .5/\sqrt{6.4/481.7}$$

$$= 4.34$$

With the crest height at +6.5' LWD

$$H_{6_1} = R(1.04 - H_T/.54 H_i)$$

$$(6.5 - 6.6) = 6.0(1.04 - H_T/.54(6.4))$$

$$H_T = (.1 + 6.24)\left(\frac{6.4 \times .54}{6.0}\right)$$

$$= 3.65'$$

A 3.7 foot transmitted wave will occur during the occurrence of a 10-year wave/20-year lake level.

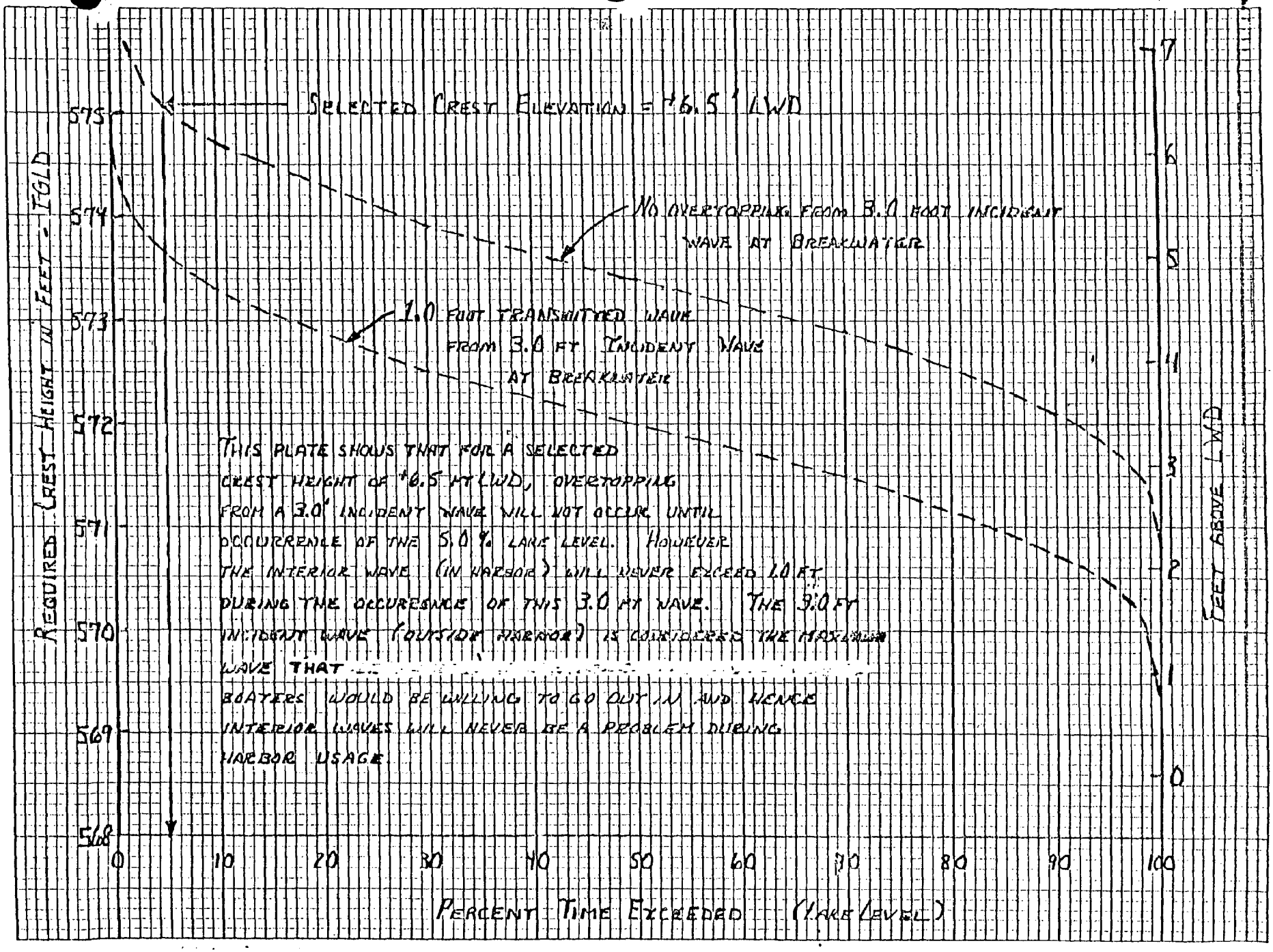

SELECTED CREST ELEVATION = +6.5 FT LWD
NO OVERTOPPING FROM 3.0 FOOT INCIDENT WAVE AT BREAKWATER
1.0 FOOT TRANSMITTED WAVE FROM 3.0 FT INCIDENT WAVE AT BREAKWATER
THIS PLATE SHOWS THAT FOR A SELECTED CREST HEIGHT OF +6.5 FT LWD, OVERTOPPING FROM A 3.0' INCIDENT WAVE WILL NOT OCCUR UNTIL OCCURRENCE OF THE 5.0 % LAKE LEVEL. HOWEVER THE INTERIOR WAVE (IN HARBOR) WILL NEVER EXCEED 1.0 FT. DURING THE OCCURENCE OF THIS 3.0 FT WAVE. THE 3.0 FT INCIDENT WAVE (OUTSIDE HARBOR) IS CONSIDERED THE MAXIMUM WAVE THAT BOATERS WOULD BE WILLING TO GO OUT IN AND HENCE INTERIOR WAVES WILL NEVER BE A PROBLEM DURING HARBOR USAGE.
REQUIRED CREST HEIGHT IN FEET = IGLD
575
574
573
572
571
570
569
568
0
10
20
30
40
50
60
70
80
90
100
PERCENT TIME EXCEEDED (LAKE LEVEL)
FEET ABOVE LWD
7
6
5
4
3
2
1
0

PLATE C15

Offshore Breakwater Protecting Beach

- Entire breakwater designed as head section with stone sizes discussed previously.

- Crest Height

To prevent tombolo formation, a 3 foot transmitted wave during design conditions was allowed.

Runup: $H_i = 6.4'$, $L = 481.7'$

$$\gamma = \tan\theta / \sqrt{H/L_o}$$

$$= .5 / \sqrt{6.4/481.7}$$

$$= 4.33$$

$$R = H_i \left(\frac{0.6923}{\gamma + .5643} \right)$$

$$= 6.4 (.942)$$

$$= 6.03'$$

Transmitted Wave

$$H_{ti} = R (1.04 - H_T / .54 H_i)$$

$$= 6.03 (1.04 - 3/.54(6.4))$$

$$= 1.04'$$

$\therefore$ Crest Height = $1.04' + 6.6' = +7.6$ ft LWD

- Distance Offshore

The breakwater should be placed at least twice as far seaward of the artificial placed shoreline as the expected shore advance. With the placed beach at ~ 75' width, twice this is 150'. Allowing for some extra shore advance between breakwaters of 25', this results in 175 feet offshore.

- Structure length (at +2' LWD)
The structure length should be less than the distance offshore, say 125 feet.

- Distance from West Breakwater of Small Boat Harbor
Based on existing projects use GAP / Breakwater length = 1.5
Hence Distance = 1.5(125) = 187.5' say 175'

Beach Fill Needed (Plan C only)

The existing and improved beach profiles were determined by using the known existing and assumed improved shoreline and by assuming a foreshore slope of 1:12 (above +2' LWD) and offshore slope of 1:20. Five estimated existing and improved cross-sections were computed. The initial quantity of beach fill needed was calculated as the change in area multiplied by length. In plate C16 the assumed beach cross-sections are presented.

- Determine Cross-sectional Areas

Section 1-1

$$\text{Existing} = \left[\frac{(9+4)}{2}(60') + \left(\frac{4+0}{2}\right)(160)\right]$$
$$= 550 \text{ ft}^2$$

$$\text{Improved} = \left[(8\times 20) + \left(\frac{10+4}{2}\right)(70) + \left(\frac{4+0}{2}\right)(80)\right]$$
$$= 810 \text{ ft}^2$$

$$\Delta \text{Area}_{1-1} = 810 - 550 = 260 \text{ ft}^2$$

Section 2-2

$$\text{Existing} = \left[\left(\frac{7.6+4}{2}\right)(43) + 160\right]$$
$$= 409.4 \text{ ft}^2$$

$$\text{Improved} = \left[\left(\frac{9.8+4}{2}\right)(70) + 160\right]$$
$$= 643$$

$$\Delta \text{Area}_{2-2} = 643 - 409.4 = 233.6 \text{ ft}^2$$

Section 3-3

Existing = $\left[\left(\frac{5.6+4}{2}\right)(20)+160\right]$

= 256 ft²

Improved = $\left[10\times10+\left(\frac{10+4}{2}\right)(70)+160\right]$

= 750 ft²

$\Delta Area_{3-3}$ = 750 − 256 = 494 ft²

Section 4-4

Existing = 160

Improved = $\left[\left(\frac{9+4}{2}\right)(60)+160\right]$

= 550 ft²

$\Delta Area_{4-4}$ = 550 − 160 = 390 ft²

Section 5-5

Existing = 0

Improved = $\left[\left(\frac{7.75+4}{2}\right)(45)+160\right]$

= 424.4 ft²

$\Delta Area_{5-5}$ = 424.4 ft²

- Determine Volume

The volume excluded is

$$= L_{1-2}\left(\frac{\Delta A_1+\Delta A_2}{2}\right) + L_{2-3}\left(\frac{\Delta A_2+\Delta A_3}{2}\right) + L_{3-4}\left(\frac{\Delta A_3+\Delta A_4}{2}\right)$$

$$+ L_{4-5}\left(\frac{\Delta A_4+\Delta A_5}{2}\right) + L_{5-END}\left(\frac{\Delta A_5+0}{2}\right)$$

$$= (125)\left(\frac{260+233.6}{2}\right) + (112)\left(\frac{233.6+494}{2}\right) + (57)\left(\frac{494+390}{2}\right)$$

$$+ 74\left(\frac{390+424.4}{2}\right) + (80+85)\left(\frac{424.4}{2}\right)$$

↑ extend to zero area existing at −2'

$= 30850 + 40745.6 + 25194 + 30132.8 + 35013$
$= 161935.4\ ft^3$
$= 5997.6\ yd^3$

Assume 10% initial overfill $= 599.8\ yd^3$

Total vital fill $= 5997.6 + 599.8$
$= 6597.4$ say $\underline{6600\ yd^3}$ ≈

Annual Nourishment: Lakeview has been needing 1% ∴
$.01 \times 6600 = 66$
say $\underline{70\ yd^3/year}$

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