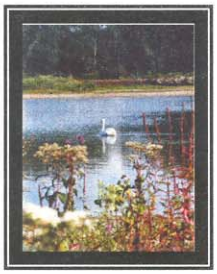
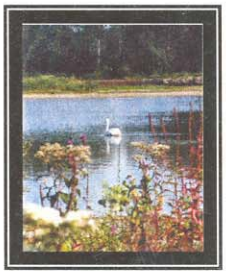


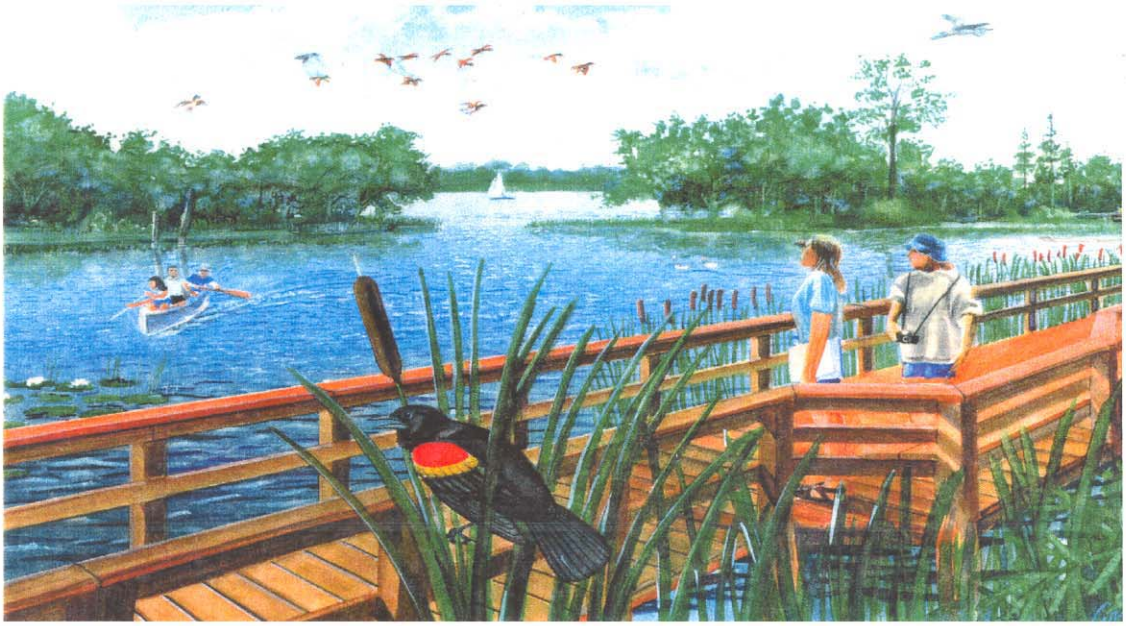
BEND AREA PARK SITE

A Planned Mining and Reclamation Program



GEORGETOWN TOWNSHIP, MICHIGAN

"A Plan to Create Attractive Landscapes Through Mining"



Prepared For

OTTAWA COUNTY PARKS AND RECREATION COMMISSION

Ottawa County, Michigan

SEPTEMBER

2000

Prepared By

BAUER-FORD RECLAMATION DESIGN
Reclamation Planners & Landscape Architects
Lansing, Michigan
with
Landscape Architects & Planners, Inc.

BEND AREA MASTER PLAN

GEORGETOWN TOWNSHIP
OTTAWA COUNTY, MICHIGAN
August, 2000

Ottawa County Parks & Recreation Commission
Ottawa County, Michigan

A Plan to Reshape Mined Landscapes for Future Use

Prepared by

BAUER-FORD RECLAMATION DESIGN, L.L.C
Reclamation Planners & Landscape Architects
with
Landscape Architects & Planners, Inc.
Lansing, Michigan

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I. INTRODUCTION

A. BACKGROUND

The Ottawa County Parks and Recreation Commission is in the process of expanding into a County-wide park system that will meet future recreational needs of a growing County population. The **BEND AREA** project represents a potential for addressing two objectives of the proposed County Park System.

1. A water-based recreation facility located on the east side of the County.
2. Establishing a greenway on the Grand River.

In the process of searching for suitable environments in the eastern part of Ottawa County, the Commission was attracted to the aggregate mining areas located along the Grand River in Georgetown Township, for seven reasons:

1. Location in relation to population centers.
2. Size of the combined holdings of the mining interests.
3. The potential for a large water body as a result of mining.
4. The potential for protecting existing and for creating additional wetlands and aquatic habitation.
5. The potential for creating interesting land forms along an undeveloped part of the riverfront.
6. Relation to the Grand River.
7. The potential for adding a sizeable link to the Grand River Greenway Path System.

The Commission also saw the potential presented by aggregate mining in creating unique landscapes that can be beneficial to both the Community and the environment. In doing so, they recognized the major role mining companies have in shaping a new and attractive landscape.

Finally, an important component of the Parks Commission's mission is to promote high standards for environmental quality and land use planning. By taking the lead role in coordinating a positive end use for a heavily impacted landscape, the Commission is following its mission and helping Georgetown Township achieve goals for an orderly development of the area and in enhancing the quality and value of that part of the Township.

B. SCOPE OF STUDY

In response to the interests of the County, the mining companies, and Georgetown Township, a study boundary that encompassed approximately 1,000 acres was defined. This study area is bordered on the north and east by the Grand River; on the south by the golf course, Taylor Street, residential properties and Filmore Street; and on the west by 22nd Avenue (Figure 1). The study involved active participation by all three interests.

C. STUDY OBJECTIVES

The primary purposes of this study are:

1. To evaluate the overall development and end-use potential of the project site.

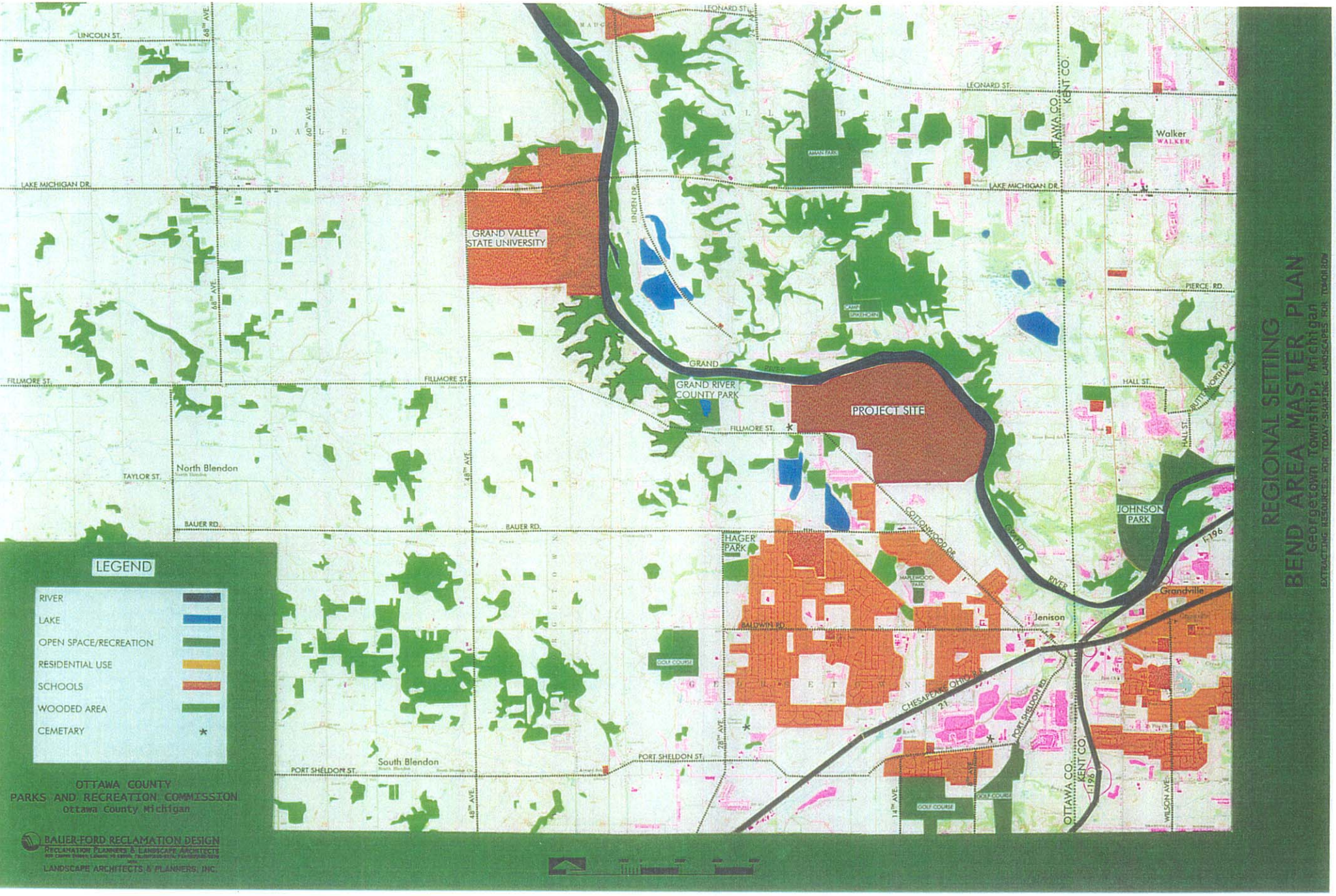

REGIONAL SETTING
BEND AREA MASTER PLAN
Georgetown Township, Michigan
EXTRACTING RESOURCES FOR TODAY-SHAPING LANDSCAPES FOR TOMORROW
GRAND VALLEY STATE UNIVERSITY
PROJECT SITE
GRAND RIVER COUNTY PARK
HAGER PARK
JOHNSON PARK
Walker
Jenison
Grandville
North Blendon
South Blendon
LEONARD ST.
LAKE MICHIGAN DR.
FILLMORE ST.
BAUER RD.
PORT SHELDON ST.
BALDWIN RD.
PIERCE RD.
HALL ST.
TAYLOR ST.
LINCOLN ST.
GRAND RIVER
OTTAWA CO.
KENT CO.
LEGEND
RIVER
LAKE
OPEN SPACE/RECREATION
RESIDENTIAL USE
SCHOOLS
WOODED AREA
CEMETARY
OTTAWA COUNTY
PARKS AND RECREATION COMMISSION
Ottawa County Michigan
BAUER-FORD RECLAMATION DESIGN
RECLAMATION PLANNERS & LANDSCAPE ARCHITECTS
LANDSCAPE ARCHITECTS & PLANNERS, INC.

FIGURE 1

2. To set forth a plan that will provide long range guidelines for the mining and co-ordinated public and private development of the site.
3. To set forth a plan of action for the development of a significant Ottawa County Park that includes a key segment of the Grand River Greenway Path System.

The more specific objectives of this study are:

1. To develop a Master Plan for a proposed County park, which meets identified needs including swimming, trails, etc.
2. To encourage mining of all remaining aggregate resources in the study area.
3. To determine the existing and potential character of the mined-out landscape based upon an evaluation of the geologic and surficial characteristics.
4. To understand the mining process and its potential for creating desired landscapes.
5. To evaluate the relationship between this site, surrounding land uses, and long range interests of Georgetown Township.
6. To take into account the long range development interests of the landowners within the study area.
7. To develop guidelines for the systematic reclamation of the mined areas.

D. STUDY PROCESS

The study authorized by the Ottawa County Parks and Recreation Commission set forth a detailed interactive process with the primary interest groups described above.

The study process involved the following steps:

1. Pre-design meeting with individual landowners, the Commission and representatives of Georgetown Township.
2. Field investigation of the site and mining processes, review of available planning documents and evaluation of individual landowner plans.
3. Review of preliminary design concepts with Georgetown Township, individual landowners, and the Commission. This included a public presentation to Georgetown Township. A series of subsequent meetings with landowners as a group and on an individual basis was held prior to and upon completion of the preliminary master plan.
4. Presentation of a draft report to all interested parties.
5. Public presentation of final master plan and report to all interested parties.

II. AGGREGATE MINING - ITS ROLE IN THE PROCESS

A. OWNERSHIP

Six landowners own property considered as part of the study area. Five of these landowners have mining interests within the site. Table1lists the landowners and some characteristics about their holdings. The acreages are estimates and may vary slightly for each owner. (Figure 2)

Table 1

PROPERTY OWNERSHIP/RESERVES

Owner	Total Acreage	Mineable Reserves
Huizenga	235	54.9 Acres
Grand Rapids Gravel	120	25.8 Acres
Ottawa County Road Commission	85.1	75.3 Acres
DeWent Gravel	80	75.5 Acres
Boynton Gravel Co.	435	24.5 Acres
Bill Boynton	85	0.0 Acres

B. SCOPE OF MINING

Under all circumstances, mining is considered the primary, although transitory use. With decreasing reserves in the region, access to available reserves is critical to the interest of the industry and to the community. Consequently, this plan is influenced by the need to access as much of the reserves as possible within the project study area.

Mining companies have been consulted at every step in this planning study. Information was gathered about the aggregate reserves, mining procedures, and long term plans for the respective properties. To the extent possible, this information was incorporated into the various concepts and plans and presented to each of the landowners, with the request to review these documents for content and accuracy and provide any feedback to the consultant. This information was subsequently considered and incorporated, as appropriate, into a modified plan. The landowners were invited to comment on any and all aspects of the plan.

C. ROLE AND CONTRIBUTION OF MINING COMPANIES

To the average person, the present character of the site may be considered somewhat chaotic and unsightly with the general sense that this disturbed site has limited value. The reality is quite different. The direct result of mining is the potential for creating a distinct and uniquely attractive landscape. It is because of mining the potential exists for creating large open water areas; additional wetlands and special aquatic habitats; an expanded flood plain; and distinct land forms that allow the development of valuable housing sites and a wide variety of recreation related uses. The **BEND AREA** is a good example how the mining of one resource has resulted in the potential for creating another productive and attractive resource.

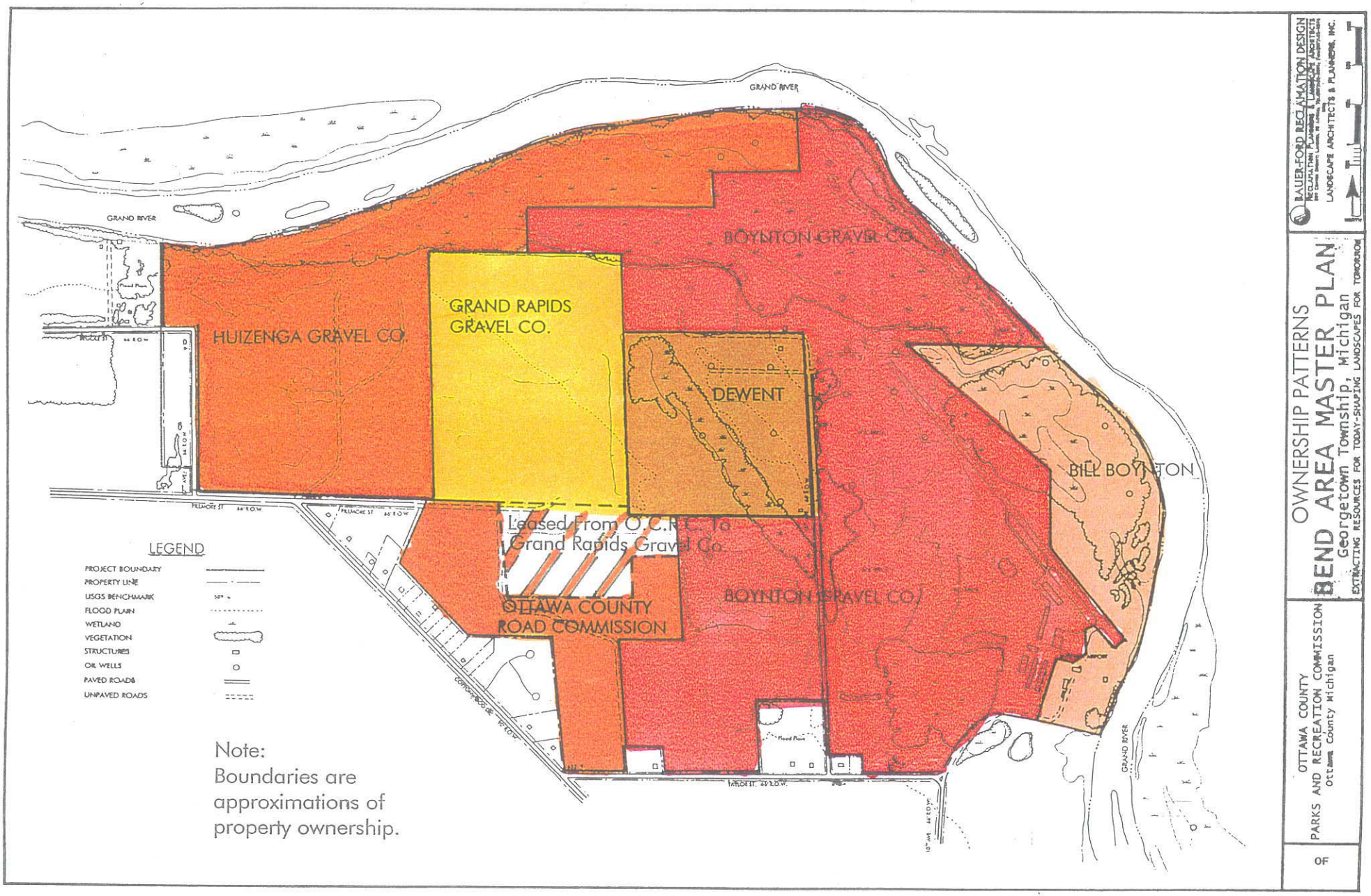

GRAND RIVER
GRAND RIVER
HUIZENGA GRAVEL CO.
GRAND RAPIDS GRAVEL CO.
BOYNTON GRAVEL CO.
DEWENT
BILL BOYNTON
Leased From O.C.R.C. To Grand Rapids Gravel Co.
OTTAWA COUNTY ROAD COMMISSION
BOYNTON GRAVEL CO.
GRAND RIVER
LEGEND
PROJECT BOUNDARY
PROPERTY LINE
USGS BENCHMARK
FLOOD PLAIN
WETLAND
VEGETATION
STRUCTURES
OIL WELLS
PAVED ROADS
UNPAVED ROADS
Note:
Boundaries are approximations of property ownership.
BAUER-FORD RECLAMATION DESIGN
LANDSCAPE ARCHITECTS & PLANNERS, INC.
OWNERSHIP PATTERNS
BEND AREA MASTER PLAN
Georgetown Township, Michigan
EXTRACTING RESOURCES FOR TODAY-SHAPING LANDSCAPES FOR TOMORROW
OTTAWA COUNTY
PARKS AND RECREATION COMMISSION
Ottawa County Michigan
OF

FIGURE 2

The Ottawa County Parks and Recreation Commission, through the authorization of this study, has taken the initiative in working with both the mining companies and Georgetown Township in creating an attractive and valuable landscape for future generations. The mining companies will continue to be involved in the process in a variety of ways; whether it is simply expanding the lake area, shaping habitats and special land forms; or recontouring shorelines to create stable environments.

D. TIME FRAME

It is important to stress that the **BEND AREA** will not be turned into an attractive landscape in an instant. Mining is expected to continue in parts of the site for twenty or more years. This does not mean that reclamation of certain land and water areas could not be initiated earlier. As a point of fact, some mined-out areas could be reclaimed as soon as proper plans can be developed. The opportunities and need for a phased-in acquisition and reclamation program exist today. (See suggested schedule in Chapter VI.)

However because of the long term presence of active mining operations, it is unlikely any authorized public use of a potential park will occur for many years. This time frame provides three distinct benefits:

1. It will allow mining companies to extract this important resource without public interference and under a long term land use development guide.

2. It will allow the County Park and Recreation Commission to develop a coordinated financial strategy that will maximize the matching of local monies with private, state, and federal funds.

3. It will permit the development of systematic reclamation and land management that will allow the maturing of a rich aquatic and wildlife habitat for the public.

III. SITE INVENTORY AND ANALYSIS

A. REGIONAL CONTEXT

1. **Land Use**

   The site is located at the north edge of residential growth in Georgetown Township. Lands to the west, north and northeast are predominantly agriculture; lands to the south are primarily residential. A golf course is located on the southeast corner of the property.

2. **Access**

   Fillmore Street, a major east-west route, and Cottonwood Road, a south route, are the primary access ways to the site. The Grandville/I-96 interchange is three miles southeast of the site and the Allendale/I-96 interchange is seven miles to the northwest.

3. **Utilities**

   The site is served by all utilities. These are located along Fillmore and Taylor Streets.

4. **Existing Parks**

   Grand River County Park is a major county park near this site. It is located on the Grand River, approximately two miles to the west of the project site. Hager Park is a high use county park located two miles to the southwest. No beach/swimming facilities are in this part of Ottawa County. In addition, the Georgetown Park of Maplewood is the closest township park located approximately one mile south of the project site.

5. **Grand River**

   The Grand River is seasonally navigable from Grand Rapids to Lake Michigan at Grand Haven. A channel connects the northeastern part of the site to the Grand River. This channel can accommodate house boats and small water craft. It also serves a commercial river boat that provides short dinner and entertainment cruises on the Grand River.

6. **Existing Reclaimed Gravel Pits**

   Several existing sand and gravel pit lakes have been reclaimed as a single family housing project in an area south of this site. The value of 100 foot wide lake-oriented lots range from $900 to $1,500 per lineal foot of frontage. This represents a typical lot price of between $90,000 to $150,000 for a 12,000 to 15,000 square foot lot. Translated into value per acre, one acre of water front property ranges in value between $300,000 and $450,000.

7. **Historic Features**

   Early settlers used the Grand River as the primary means of transportation. As a result, some of the earliest homes, farms and communities were located along the banks of the river. Following are historic features of note:

   a. HAIRES LANDING: Established as a landing and sawmill in 1856 by John Haire, it became one of the important stops for steamboats running between Grand Rapids and Grand Haven. Several homes and stores were constructed; most of the remnants are now gone. The landing site is located at the end of 22nd Avenue on the south shore of the Grand River.

   b. HAIRE CEMETERY: This cemetery is located at the northwest corner or the Fillmore Street and 22nd Avenue intersection. It contains several pioneer grave sites.

c. SITE HISTORY: Based upon an 1876 map of Georgetown Township, the bulk of the project site was owned by two families. J. Haire owned what is now the Huizenga and Grand Rapids Sand and Gravel properties, and the Boynton family owned a major portion of what is now Boynton Gravel and Bill Boynton properties. There is a general reference to Boynton Landing and the Boynton Grove, a popular summer picnic spot along the river during the late 1800's.

8. County Grand River Greenway Path System

Long range plans call for the development of a recreational path system along the entire length of the Grand River from Grand Haven to the Kent County Line. The paved multi-use trail is proposed to be routed through this site.

B. INVENTORY (Figures 3 & 4)

1. Land Use

a. MINING -The primary use of the site has been and will continue to be for a number of years aggregate mining. All of the Huizenga, Grand Rapids Gravel Co. and Ottawa County Road Commission lands are used as such. The Road Commission leases a portion of their site to Grand Rapids Gravel Co. and periodically extracts and processes relatively small quantities of materials from the site. A major portion of the Boynton Gravel Co. property has been mined with selective mining occurring southwest of the airport runway and in the southeastern portion of the site. The Dewent property contains a significant reserve of sand and gravel. No permit to mine has been issued for this property. No mining is anticipated on the Bill Boynton property.

The following table illustrates the estimated life of the mining operations for each site. **It is important to note these are only rough estimates.** The actual life of each operation is dependent upon the production and market capacity of each operator, the whims of the economy and the amount of reserves.

Table 2

ESTIMATED MINING OPERATIONS LIFE

Company	Projected Years of Operation
Huizenga Gravel Co.	15 - 20+ Years
Grand Rapids Gravel Co.	1 - 5 Years
Ottawa County Road Commission	More Than 20 Years
DeWent	10 - 20 Years from Start of Operation
Boynton Gravel Co.	2 - 4 Years
Bill Boynton	0 Years

b. OIL WELLS - Currently twenty six (26) oil wells exist in the northeastern quadrant of the project. All but five (5) are in mined-out areas or in unminable areas. These five are located on the DeWent property. In addition, an oil storage operations building is located in the northeast corner of the DeWent property. Most of the wells are operating wells (the specific life and status of each is unknown).

c. AIRPORT - A private single 2,800 foot runway airport is located on the east side of the Boynton Gravel Co. property. In addition to the runway are hangers, an office and related support structures.

d. ON-SITE RESIDENCES -Three (3) on-site residences are noted. Two are located at the end of 12th Avenue and one is located south of the runway near the Grand River.

e. ROCKY POINT ESTATES - A thirty two (32) unit plat is being processed north of Taylor Street approximately 660 feet west of 12th Avenue on the property owned by Boynton Gravel Co. Most of the lots will front on a created lake. The typical lot sizes are in the range .35 to .57 acres.

f. MISCELLANEOUS USES - A channel has been cut to the Grand River from Boynton Gravel Co. land. This channel allows boat access to Boynton Gravel Company land.

g. ADJACENT LAND USE -Lands north and east of the project site are primarily wooded large estate type residential properties. On the west side are several large-lot residences and open fields. South of the project site are single family homes and several churches. A golf course is situated along the river adjoining the southeast corner of the site.

h. UTILITIES - The site is served by all utilities located along Taylor and Fillmore Streets.

i. ACCESS - All properties, except DeWent, have access off Taylor or Fillmore Streets and off 10th Avenue. The DeWent property fronts on 12th Avenue which extends north from Taylor Street. The Huizenga land is served by both Fillmore Street and 22nd Avenue. Fillmore Street has a 90 foot right-of-way. All other public roads have a 66 foot right-of-way.

j. TRUCK ACCESS - Gravel truck access from the Huizenga land is directly onto Cottonwood/Fillmore Streets. Access from the County land and from Grand Rapids Gravel is 600 feet east of Cottonwood onto Taylor Street. Access from DeWent property to Cottonwood is along 12th Avenue south to Taylor Street then either east 1,100 feet to 10th Avenue or one half mile west to Cottonwood. Access from the existing Boynton Gravel Co. land is onto Taylor Street either 500 feet east to 10th Avenue or 3,200 feet west to Cottonwood.

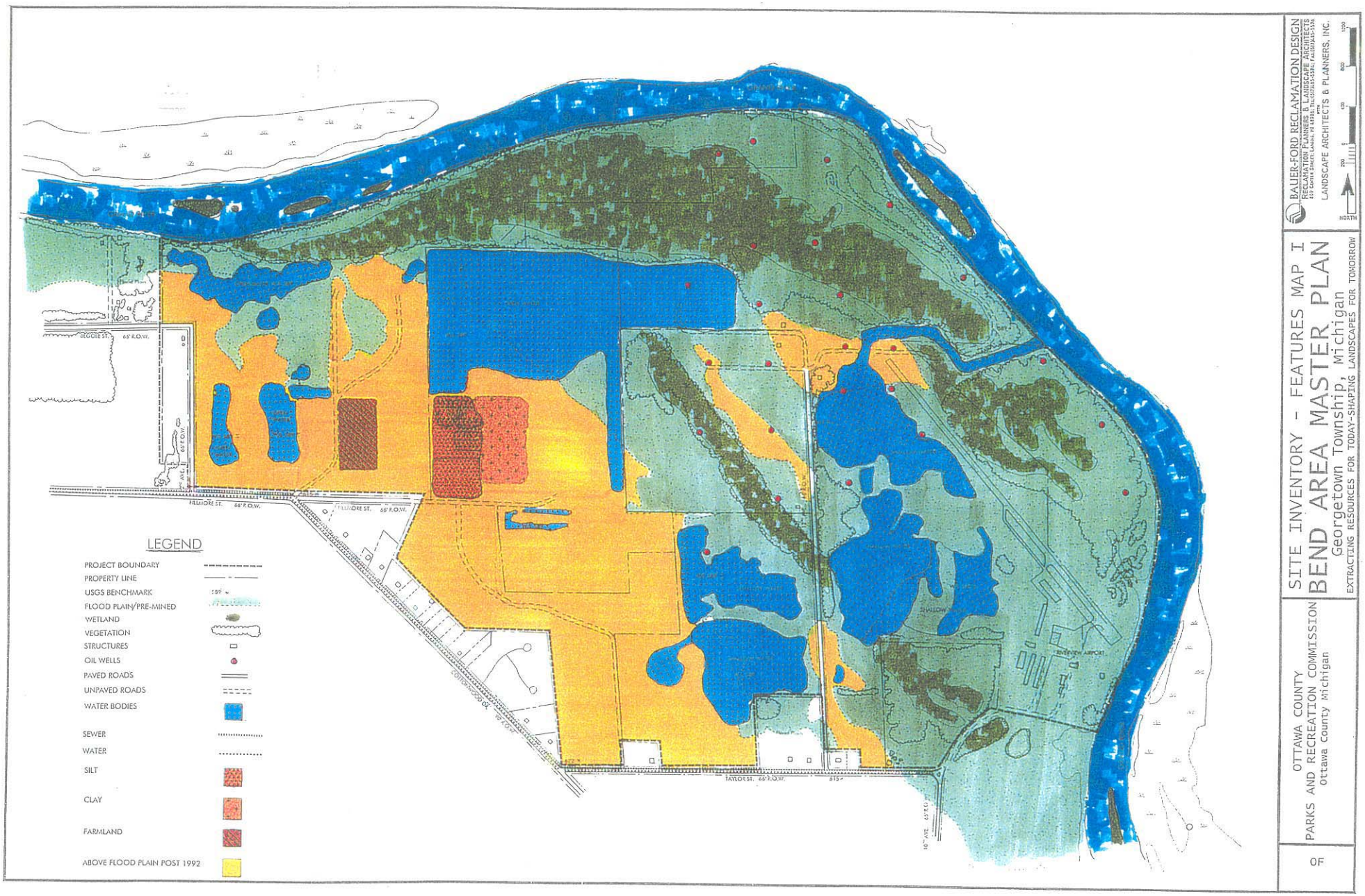
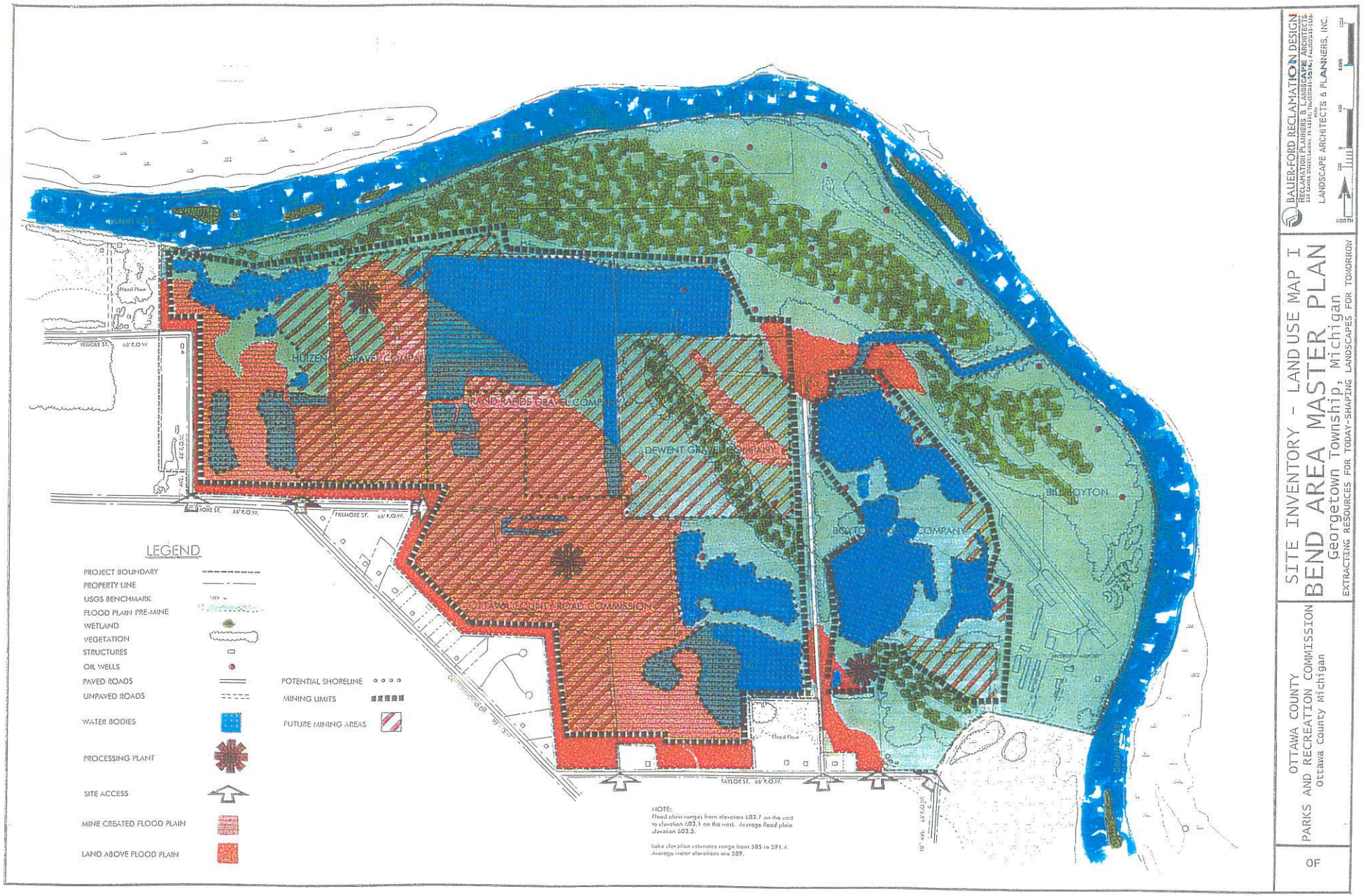

LEGEND
PROJECT BOUNDARY
PROPERTY LINE
USGS BENCHMARK
FLOOD PLAIN/PRE-MINED
WETLAND
VEGETATION
STRUCTURES
OIL WELLS
PAVED ROADS
UNPAVED ROADS
WATER BODIES
SEWER
WATER
SILT
CLAY
FARMLAND
ABOVE FLOOD PLAIN POST 1992
FILLMORE ST. 66' R.O.W.
TAYLOR ST. 66' R.O.W.
SHALLOW
RIVERVIEW AIRPORT
BAUER-FORD RECLAMATION DESIGN
RECLAMATION PLANNERS & LANDSCAPE ARCHITECTS
LANDSCAPE ARCHITECTS & PLANNERS, INC.
NORTH
SITE INVENTORY - FEATURES MAP I
BEND AREA MASTER PLAN
Georgetown Township, Michigan
EXTRACTING RESOURCES FOR TODAY-SHAPING LANDSCAPES FOR TOMORROW
OTTAWA COUNTY
PARKS AND RECREATION COMMISSION
Ottawa County Michigan
OF

FIGURE 3


BAUER-FORD RECLAMATION DESIGN
RECLAMATION PLANNERS & LANDSCAPE ARCHITECTS
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SITE INVENTORY - LANDUSE MAP I
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OF
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GRAND RAPIDS GRAVEL COMPANY
DEWENT GRAVEL COMPANY
BOXTON GRAVEL COMPANY
OTTAWA COUNTY ROAD COMMISSION
BILLBOYTON
BEGOLE ST. 66' R.O.W.
MORE ST. 66' R.O.W.
FERMORE ST. 66' R.O.W.
TAYLOR ST. 66' R.O.W.
10th AVE. 66' R.O.W.
Flood Plain
LEGEND
PROJECT BOUNDARY
PROPERTY LINE
USGS BENCHMARK
FLOOD PLAIN PRE-MINE
WETLAND
VEGETATION
STRUCTURES
OIL WELLS
PAVED ROADS
UNPAVED ROADS
WATER BODIES
PROCESSING PLANT
SITE ACCESS
MINE CREATED FLOOD PLAIN
LAND ABOVE FLOOD PLAIN
POTENTIAL SHORELINE
MINING LIMITS
FUTURE MINING AREAS
NOTE:
Flood plain ranges from elevation 603.7 on the east to elevation 603.1 on the west. Average flood plain elevation 603.5.
Lake elevation estimates range from 585 to 591.4. Average water elevations are 589.

FIGURE 4

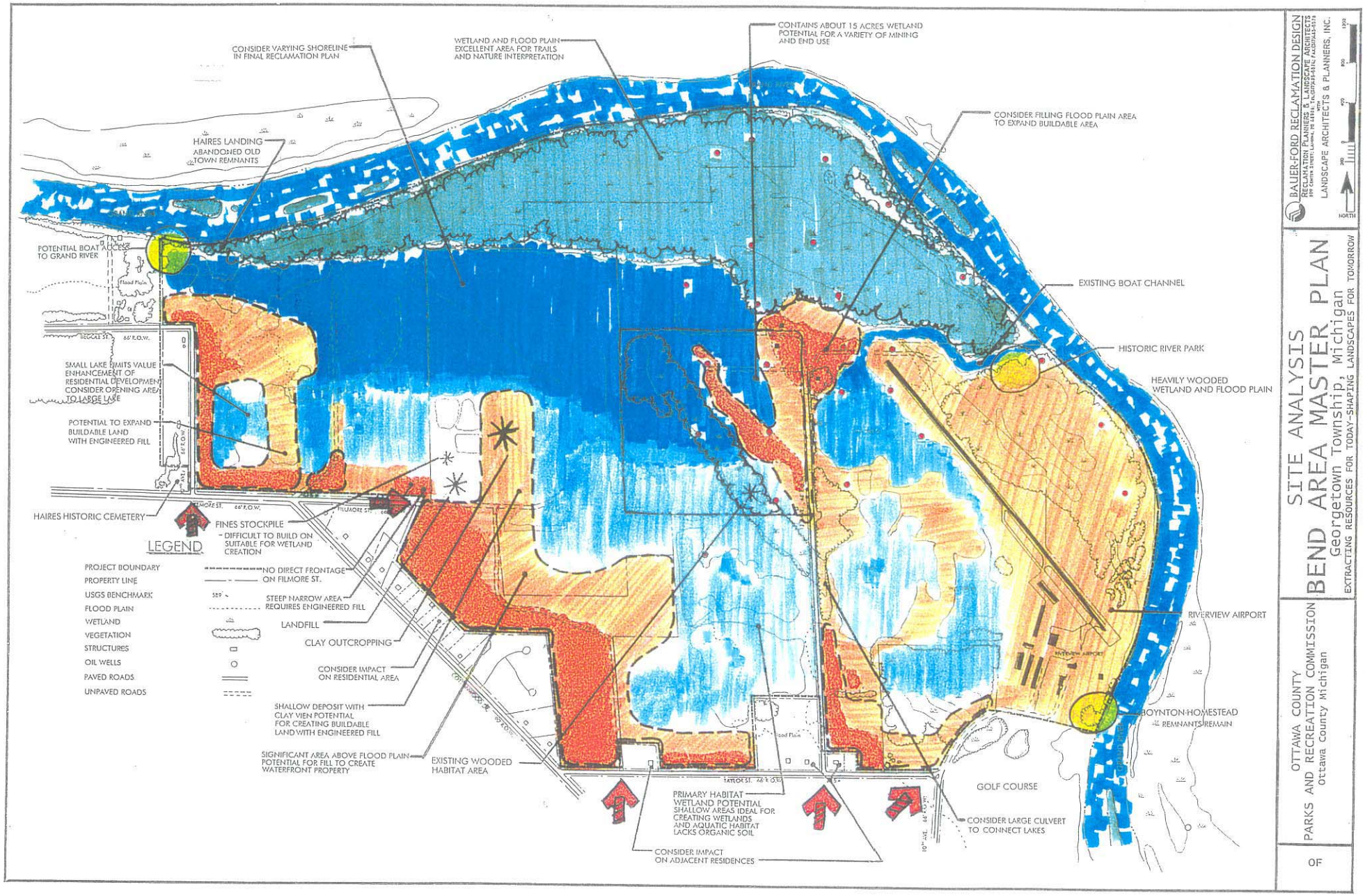
CONSIDER VARYING SHORELINE IN FINAL RECLAMATION PLAN
WETLAND AND FLOOD PLAIN EXCELLENT AREA FOR TRAILS AND NATURE INTERPRETATION
CONTAINS ABOUT 15 ACRES WETLAND POTENTIAL FOR A VARIETY OF MINING AND END USE
CONSIDER FILLING FLOOD PLAIN AREA TO EXPAND BUILDABLE AREA
HAIRES LANDING
ABANDONED OLD TOWN REMNANTS
POTENTIAL BOAT ACCESS TO GRAND RIVER
EXISTING BOAT CHANNEL
HISTORIC RIVER PARK
HEAVILY WOODED WETLAND AND FLOOD PLAIN
SMALL LAKE LIMITS VALUE ENHANCEMENT OF RESIDENTIAL DEVELOPMENT CONSIDER OPENING AREA TO LARGE LAKE
POTENTIAL TO EXPAND BUILDABLE LAND WITH ENGINEERED FILL
HAIRES HISTORIC CEMETERY
FINES STOCKPILE
- DIFFICULT TO BUILD ON SUITABLE FOR WETLAND CREATION
LEGEND
PROJECT BOUNDARY
PROPERTY LINE
USGS BENCHMARK
FLOOD PLAIN
WETLAND
VEGETATION
STRUCTURES
OIL WELLS
PAVED ROADS
UNPAVED ROADS
NO DIRECT FRONTAGE ON FILMORE ST.
STEEP NARROW AREA REQUIRES ENGINEERED FILL
LANDFILL
CLAY OUTCROPPING
CONSIDER IMPACT ON RESIDENTIAL AREA
SHALLOW DEPOSIT WITH CLAY VIEW POTENTIAL FOR CREATING BUILDABLE LAND WITH ENGINEERED FILL
SIGNIFICANT AREA ABOVE FLOOD PLAIN POTENTIAL FOR FILL TO CREATE WATERFRONT PROPERTY
EXISTING WOODED HABITAT AREA
PRIMARY HABITAT WETLAND POTENTIAL SHALLOW AREAS IDEAL FOR CREATING WETLANDS AND AQUATIC HABITAT LACKS ORGANIC SOIL
CONSIDER IMPACT ON ADJACENT RESIDENCES
CONSIDER LARGE CULVERT TO CONNECT LAKES
GOLF COURSE
RIVERVIEW AIRPORT
BOYNTON HOMESTEAD
REMNANTS REMAIN
BAUER-FORD RECLAMATION DESIGN
RECLAMATION PLANNERS & LANDSCAPE ARCHITECTS
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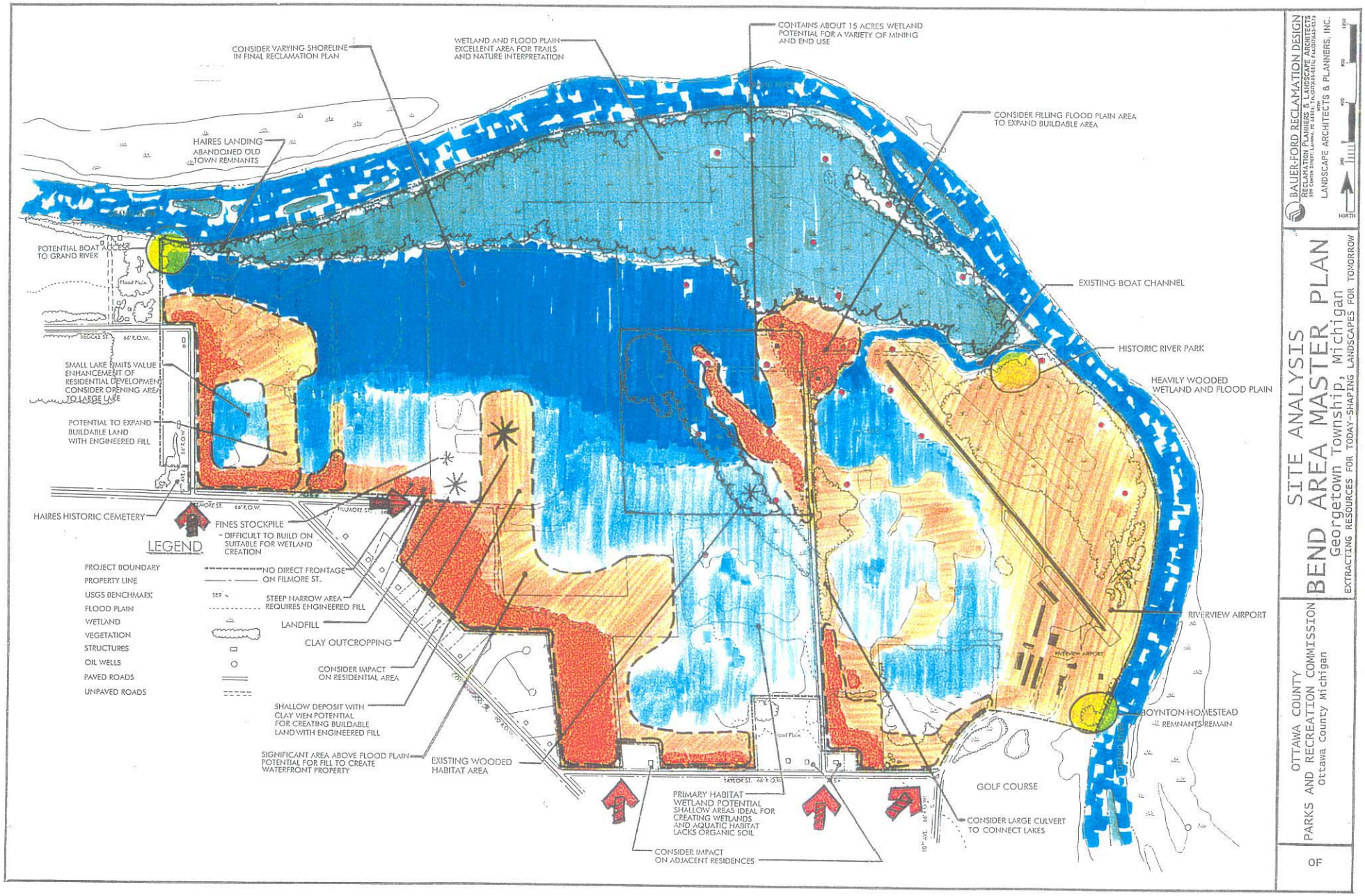
FIGURE 5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SIGNIFICANT AREA ABOVE FLOOD PLAIN POTENTIAL FOR FILL TO CREATE WATERFRONT PROPERTY
EXISTING WOODED HABITAT AREA
PRIMARY HABITAT WETLAND POTENTIAL SHALLOW AREAS IDEAL FOR CREATING WETLANDS AND AQUATIC HABITAT LACKS ORGANIC SOIL
CONSIDER IMPACT ON ADJACENT RESIDENCES
CONSIDER LARGE CULVERT TO CONNECT LAKES
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FIGURE 5

2. Operations

a. EXTENT OF MINING: The extent of mining will influence both the size and depth of the water bodies and the amount of land above flood plain that will remain for development. Issues such as the amount of DeWent land that will be mined and the extent of mining in Ottawa County Road Commission lands will influence both the character and timing of any end use development. Another factor to consider is the amount of land forming, including engineered fill, mining companies are willing to consider prior to closing out their operations.

b. LIFE OF MINING OPERATIONS: The life of each on-going operation is expected to vary from a few years to more than twenty (20) years. This is influenced by the production capacity of each company, its market potential and by the economy. This will, in turn, be a factor in the phasing of development.

c. EARTH MATERIALS (NON-COMMERCIAL): There is a very limited quantity of topsoil and subsoil on the site. Significant amounts of this material will be required in the final phase of land development. There is a large amount of fines available particularly in the Grand Rapids Gravel site. This has both negative and positive implications. The negative is that it is not suitable foundation material because it does not compact very well. However, it is very good material to build shallow wetlands because of its water retention qualities. It can also be mixed with sand to increase the water retention qualities of the sand.

3. Land Development Options

Development options are somewhat limited by the flood plain that may cover as much as ninety (90) percent of the property when it is mined out. However, one of the serious choices the landowners have is raising the elevation of selected areas in the site. This can be accomplished in two ways:

1. Haul in clean fill, layer and compact the material for building sites.
2. Excavate perimeter of low land areas and deposit the excavated material on adjacent land to raise the land above the 603.5 elevation.

With water associated real estate presently selling for $900-$1,500 per foot of shoreline on sites with less significant water bodies and landscape features than exist at this site, the potential values of these properties warrant an evaluation of the fill options.

Following are several specific use options that can be considered:

a. HOUSING - PRIMARILY LAKE FRONT UNITS:
The prime locations for this use exist along 22nd Avenue and along the full length of the southern project boundary. These areas offer the potential for elevated residential lots looking over several hundred acres of water. A second, though limited, potential area exists in the DeWent property along the northern portion of 12th Avenue. There is a sizeable area that is above or just below flood plain. If mining was limited to the western part of the site, stripped earth materials can be used to fill the east portion of the property and a significant lake-oriented housing development could be built on the site. The issue will be the value of the sand and gravel reserve versus the value of water front property and the cost of developing this property in relation to extending utilities, and in relation to improving 12th Avenue.

b. WILDLIFE HABITAT:
If all available sand and gravel reserves were mined, the end result could be one of the largest and most significant wildlife habitats in the region. Special aquatic and terrestrial habitats could be created to enhance the fish and water fowl populations; particularly when connected with the existing natural wooded areas on the north side of the property.

c. RECREATION:
While development in flood plains is restricted as far as buildings are concerned, recreational elements and uses have a natural relationship to this type of environment. This includes beaches, picnic areas, open play areas, campgrounds, parking, etc. In addition, the site could be developed as a nature interpretive area within the context of other uses.

d. PATHS:
A variety of paths through and on the perimeter of the site are proposed. One of the prime routes would be through the "preserve" area from the west side to 12th Avenue. Another would be a loop through shallow water habitat areas that could reconnect with the main trail. Depending on the path route, the length of the final path system through this site could be between six (6) and ten (10) miles.

The paths are to be constructed of different materials. For example, the nature path through the "preserve" would be paved with either or a combination of cinders, crushed limestone and shredded bark. The path through the wetlands would be an elevated wooden boardwalk, and all other paths would be paved with asphalt.

In addition because of the location of this site in relation to populated areas, this site can be used as a staging area for the entire Greenway Trial system.

e. WATER SPORTS:
Because of the size and varied character of the water bodies, a wide variety of water-based activities can be considered including fishing, kayaking, canoeing, sailing, house boating (with connections to Grand River) and swimming.

An issue of general concern is whether or not motor boats, water skiing and jet skiing should be permitted within the context of a nature oriented park. These types of water sports will have a major negative impact on the quality of the total environment and on the wetland habitat areas.

f. PRIVATE RECREATION:
A combination of public and private recreation options exist. Private recreation elements such as marinas, picnic sites, campgrounds, fishing and boat supplies, concessions and boat rentals are appropriate. One of the challenges is to design the facility so both public and private recreation can be complementary.

IV. CONCEPTS

Three concepts have been developed to illustrate various end use options and relationship. In the development of these concepts, six (6) constants were included in each.

1. The 182 acre area between the north shore of the mine site and Grand River would remain in its present state.

2. The Grand River Greenway Path would extend through the site to 12th Avenue. In addition, a secondary trail that could connect to the Greenway Path would loop through portions of the site to take advantage of other natural features, including shallow water habitat areas.

3. A non-motorized boating access culvert would be placed in 12th Avenue to allow boating connections to both sides of 12th Avenue.

4. Beach and recreation facilities are included in each concept.

5. Housing is included in each concept.

6. Commercial recreation is included in each concept.

Each concept was presented as a distinct option in the development of the project area for the purpose of soliciting comments and exploring alternative ideas.

A. CONCEPT - PRESERVE (Figure 6)

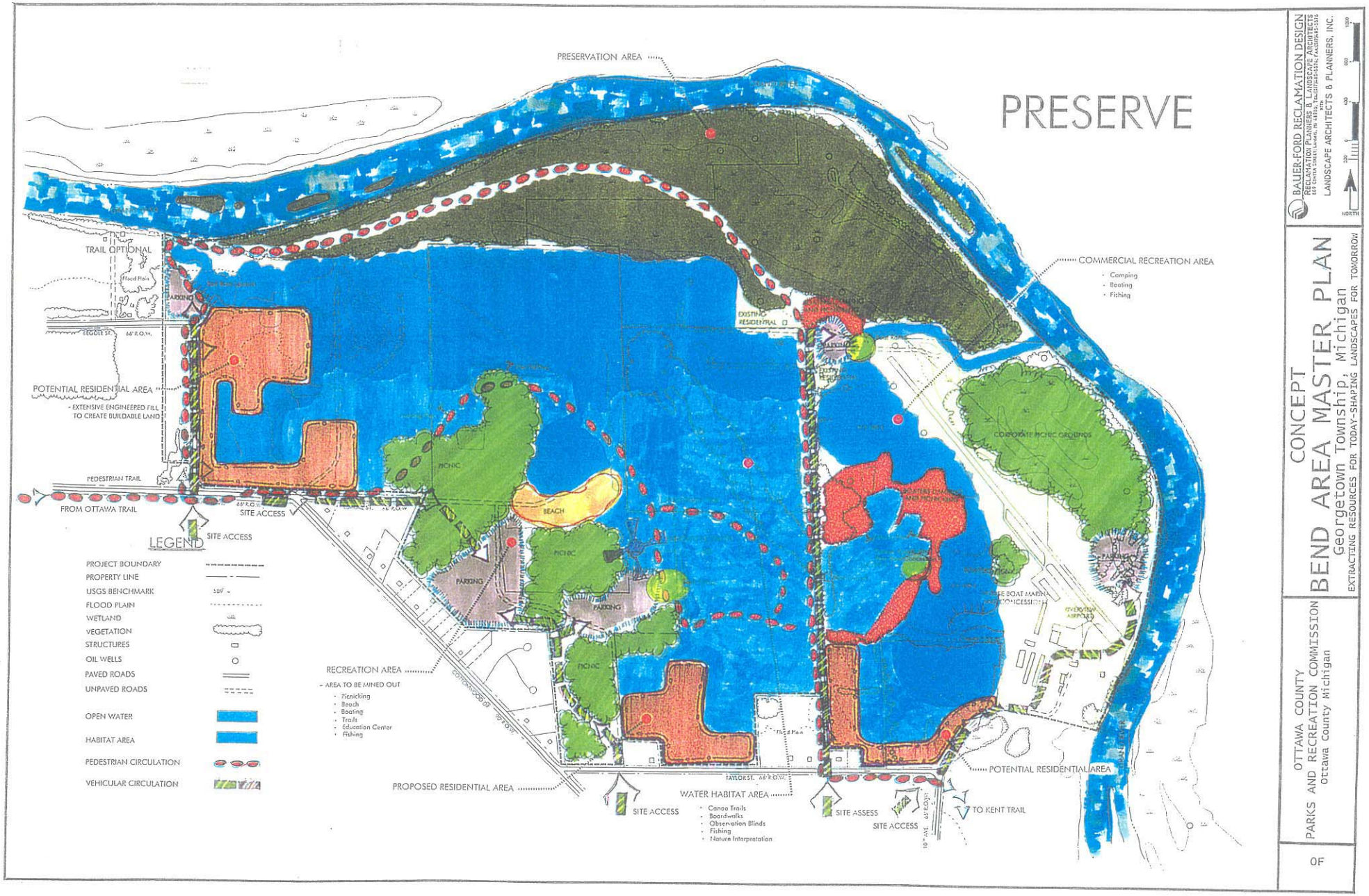
The primary focus of this concept is to create an extensive wetland habitat area with minimal housing development. It also includes a large beach/recreation area in the south center of the site on the Ottawa County Road Commission land and the Grand Rapids Gravel site. One of the distinguishing features of this Concept is that it maximizes the extraction of sand and gravel reserves, including the mining of all remaining materials in the Road Commission site to just above ground water elevations of 591. Significant housing areas are recommended on the west and southeast edges of the site.

ADVANTAGES:

1. Extensive habitat area.
2. Large recreation complex.
3. Potential for significant outdoor education center with habitat trail.
4. Extraction of all sand and gravel reserves.
5. Opportunity to link private small boating concession with public recreation area.
6. Provides for significant trail system through the site.
7. Secluded area for non-motorized boats.

DISADVANTAGES:

1. Minimal area for housing.
2. Minimal area remaining above flood plain.



BAUER-FORD RECLAMATION DESIGN
RECLAMATION PLANNERS & LANDSCAPE ARCHITECTS
LANDSCAPE ARCHITECTS & PLANNERS, INC.

CONCEPT
BEND AREA MASTER PLAN
Georgetown Township, Michigan
EXTRACTING RESOURCES FOR TODAY-SHAPING LANDSCAPES FOR TOMORROW

OTTAWA COUNTY
PARKS AND RECREATION COMMISSION
Ottawa County Michigan

0F

FIGURE 6

B. CONCEPT - WATERMARK BAY (Figure 7)

The primary focus on this concept is to develop areas for water-oriented housing units. The open water area is enlarged to accommodate motorized boating. It is enhanced by a small marina concession/restaurant near the center of the lake. The key consideration in this concept is limiting mining of sand and gravel as a tradeoff for creating housing sites. In addition, to accomplish this objective, several acres below flood plain will need to be filled. A beach and recreation area is located in the northwest portion of the project site providing direct linkage to the 180 acre preserve, but weak connections to any created wetland habitat areas.

ADVANTAGES:

1. Large water-oriented housing areas.
2. Strong connection between recreation area and 180 acre preserve.
3. Large open body of water.
4. Strong commercial recreation area.

DISADVANTAGES:

1. Leaving sizable sand and gravel reserves.
2. Poor connection between recreation area in the northwest and created habitat in the south area of the site.
3. Wetland habitat area isolated from other nature areas.

C. CONCEPT - COVE AT RIVER BEND (Figure 8)

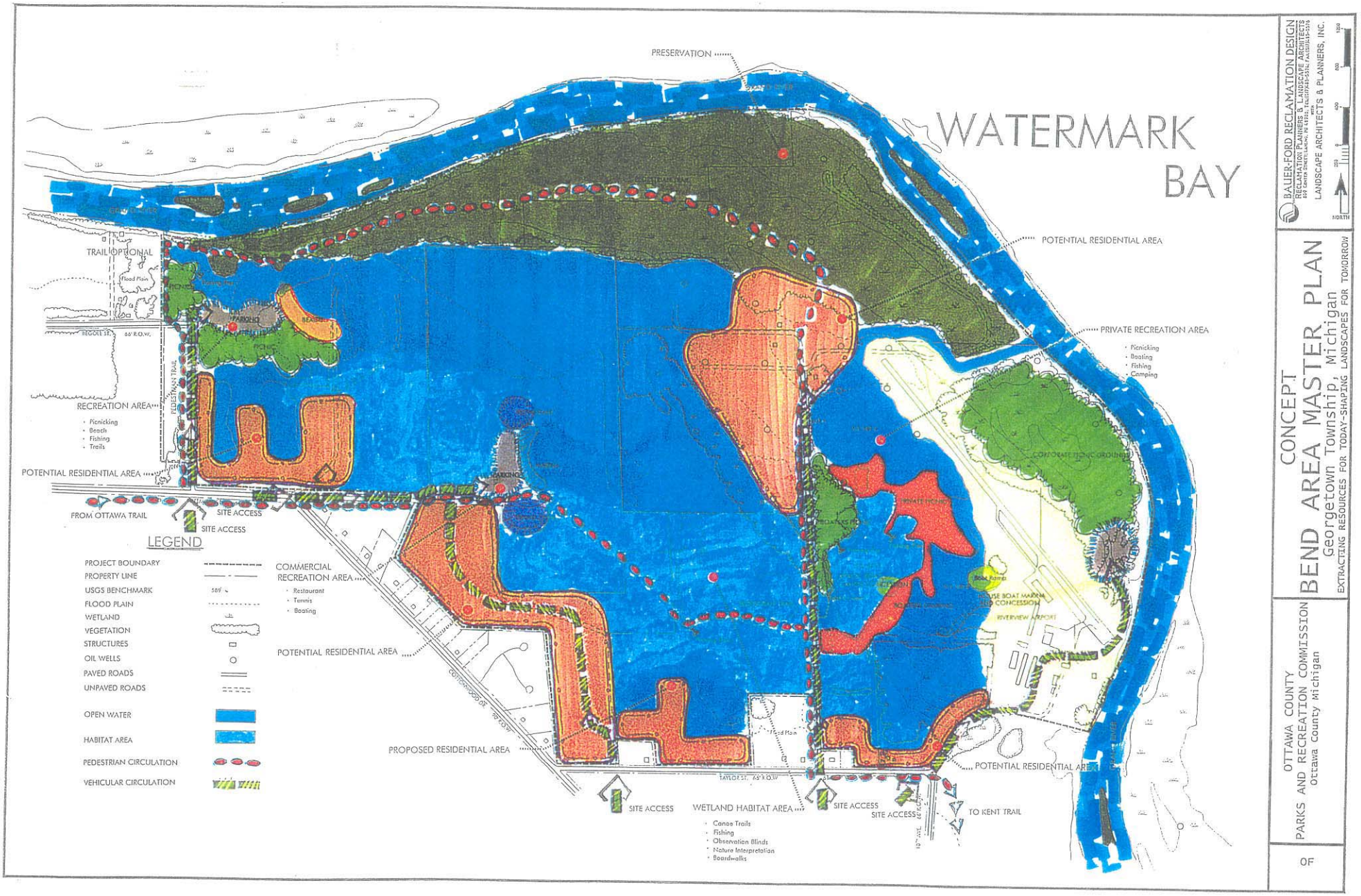
This concept centralizes the recreation areas in relation to the site and to adjacent habitat areas. In addition, a secondary recreation area is proposed that is in close proximity to proposed and existing housing. Extensive housing is proposed on the south side and along 22nd Avenue, which will require some loss of reserve and some engineered fill or a combination of the two. A large body of water with central marina/resident boat storage is proposed.

ADVANTAGES:

1. Active recreation area has a direct and strong linkage with both natural and created environments.
2. Good sun orientation of beach.
3. Strong potential linkages of private recreation concessions and public recreation activities.
4. Isolated motorized/non-motorized boating.
5. Extensive lake-oriented housing.

DISADVANTAGES:

1. Reduction of commercial recreation area.
2. Loss of some reserves or extensive filling operations.
3. Reduction of created habitat areas.
4. Heavy recreation traffic through residential areas.



BAUER-FORD RECLAMATION DESIGN
RECLAMATION PLANNERS & LANDSCAPE ARCHITECTS
LANDSCAPE ARCHITECTS & PLANNERS, INC.

CONCEPT
BEND AREA MASTER PLAN
Georgetown Township, Michigan
EXTRACTING RESOURCES FOR TODAY-SHAPING LANDSCAPES FOR TOMORROW

OTTAWA COUNTY
PARKS AND RECREATION COMMISSION
Ottawa County Michigan

OF

FIGURE 7

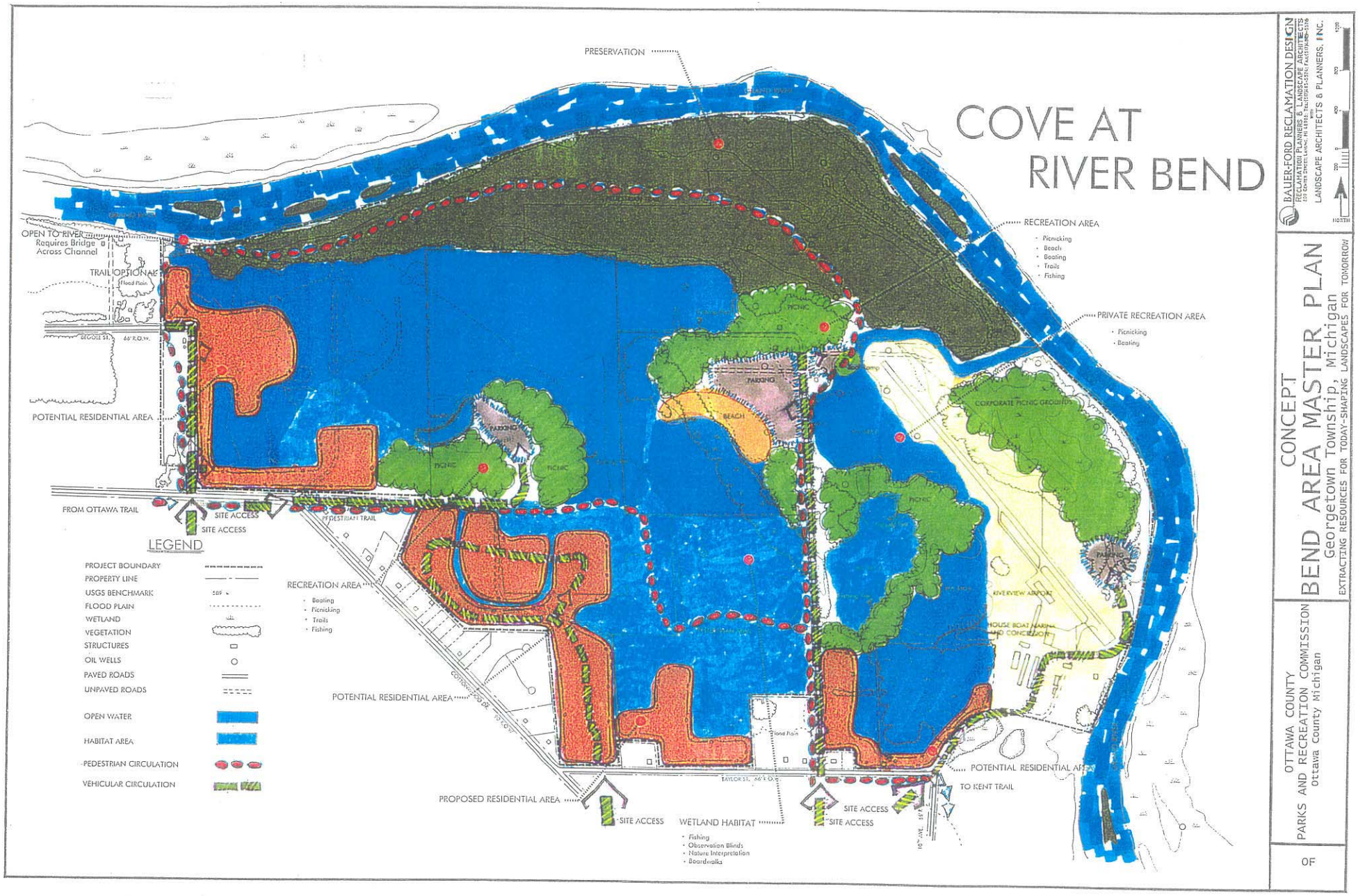

COVE AT
RIVER BEND
PRESERVATION
RECREATION AREA
Picnicking
Beach
Boating
Trails
Fishing
PRIVATE RECREATION AREA
Picnicking
Boating
OPEN TO RIVER
Requires Bridge
Across Channel
TRAIL OPTIONAL
Flood Plain
POTENTIAL RESIDENTIAL AREA
FROM OTTAWA TRAIL
SITE ACCESS
SITE ACCESS
PEDESTRIAN TRAIL
LEGEND
PROJECT BOUNDARY
PROPERTY LINE
USGS BENCHMARK
FLOOD PLAIN
WETLAND
VEGETATION
STRUCTURES
OIL WELLS
PAVED ROADS
UNPAVED ROADS
OPEN WATER
HABITAT AREA
PEDESTRIAN CIRCULATION
VEHICULAR CIRCULATION
RECREATION AREA
Boating
Picnicking
Trails
Fishing
POTENTIAL RESIDENTIAL AREA
PROPOSED RESIDENTIAL AREA
SITE ACCESS
WETLAND HABITAT
Fishing
Observation Blinds
Nature Interpretation
Boardwalks
SITE ACCESS
SITE ACCESS
TO KENT TRAIL
POTENTIAL RESIDENTIAL AR
PICNIC
PARKING
BEACH
CORPORATE PICNIC GROUNDS
RIVERVIEW AIRPORT
HOUSE BOAT MARINA
AND CONCESSION
BAUER-FORD RECLAMATION DESIGN
RECLAMATION PLANNERS & LANDSCAPE ARCHITECTS
LANDSCAPE ARCHITECTS & PLANNERS, INC.
NORTH
CONCEPT
BEND AREA MASTER PLAN
Georgetown Township, Michigan
EXTRACTING RESOURCES FOR TODAY-SHAPING LANDSCAPES FOR TOMORROW
OTTAWA COUNTY
PARKS AND RECREATION COMMISSION
Ottawa County Michigan
OF

FIGURE 8

V. MASTER PLAN (Figure 9)

A. PROCESS

The concepts were presented to the landowners, Georgetown Township, and the Ottawa County Parks and Recreation Commission for review, discussion, and comments. A series of meetings were conducted with the landowners, both on individual basis and as a group. Information gathered from these meetings were incorporated into a Preliminary Master Plan that illustrated a specific set of and arrangement of uses, facilities, lands, and water areas. This plan was then presented to the Ottawa County Parks and Recreation Commission and all the landowners on an individual basis. A general consensus was reached regarding the master plan and the Final Master Plan as described and illustrated below was created.

B. PROGRAM

1. Concept

The guiding principle for development of the Bend Area Master Plan is to create an integrated and compatible public-private program of land uses. It involves continuation of mining as a transitory use until aggregate reserves are depleted. More specifically, concepts guiding this project are:

a. To create an attractive nature-oriented county park that will:

1) Utilize the distinct land and water features created by the mining operations;

2) Preserve and expand aquatic and terrestrial wildlife habitats; and

3) Provide a variety of recreational opportunities that are compatible with proposed wildlife habitats and the Parks Commission goals.

b. To encourage private development of lands adjacent to the proposed park boundaries that take advantage of and will be compatible with the naturalistic quality of the park.

c. To explore creation of a wetland consortium of landowners who will be responsible for the development of all on-site wetlands, and who will be recognized as the owners of the wetland for wetland mitigation or wetland banking purposes. Upon completion of the wetlands, the County Parks and Recreation Department would assume responsibility for the management of the site as a wetland preserve and development of the site as a recreation area.

2. Program of Uses

The program of uses are divided into two components. The private component and the public component. The private component reflects both the expressed interests of the landowners, their completed plans as well as the general character of adjacent land uses. The purpose of this plan was to seek ways to assure the proposed private uses would be compatible with proposed public uses.

a. PRIVATE LAND USES:

1) PRIVATE RECREATION: Projects have been developed and plans for additional facilities have been prepared for the creation of a mix of private recreational facilities located east of 12th Avenue. These include:

GRAND RIVER
GRAND RIVER
GRAND RIVER
BEGOLE ST
Proposed Residential Development
FILLMORE ST
COTTONWOOD DR
COTTONWOOD DR
Private Retreat
River Landing & Corporate Park
PRIVATE LAKE
ROCK POINT ESTATES
TAYLOR ST
TAYLOR ST
Proposed Residential Development
10TH AVE
"Extracting Resources For Today-
Shaping Landscapes for Tomorrow"
BEND AREA MASTER PLAN
Georgetown Township, Michigan
OTTAWA COUNTY PARKS AND RECREATION COMMISSION
Ottawa County, Michigan
BAUER-FORD RECLAMATION DESIGN
Reclamation Planners & Landscape Architects
LANDSCAPE ARCHITECTS & PLANNERS, INC
West Section
Center Section
East Section
Possible Bridge Location.

FIGURE 9

- Corporate picnic area and landing along the Grand River, east of the airport.
- Airport facilities, including maintenance and storage facilities.
- Boat ramps, docking and maintenance facilities, and storage areas for motorized boats using the Grand River.
- Camp ground facilities.
- Picnic areas.
- Camping and boating supply store.
- Restaurant
- Private retreat facility
- Non-motorized boat rentals

2) RESIDENTIAL: Four new residential subdivisions are identified. One subdivision is under construction along Taylor Street west of 12th Avenue. Another subdivision (Minno's Cove) is being developed in the northwest corner of 12th Avenue and Taylor Street. Plans for a third subdivision are being prepared east of 22nd Avenue and north of Fillmore Street. A fourth subdivision is proposed on a portion of the County Road Commission land north of Taylor Street.

b. PUBLIC LAND USES

The proposed program of uses and facilities for the County Park is a reflection of the character of the landscape created by the mining operation as well as the stated needs and objectives of the Ottawa County Parks and Commission. The program includes the following uses and facilities:

- Swimming beach, bathhouse, and supporting parking areas.
- Boat ramp and piers for non-motorized water craft; includes parking for boat trailers.
- Amphitheater for a variety of outdoor cultural and nature educational events.
- Group and individual picnic areas with supporting parking, shelter, and restroom facilities.
- Path system and support facilities for the following:
  - Greenway path: A paved path that links up with and extends a proposed County-wide greenway path system.
  - Nature path: A soft surface path that extends into the large preserve area along the Grand River.
  - Wetland path: A boardwalk path that meanders through the created wetland and habitat areas.
  - Internal path: A paved path that provides pedestrian access to various facilities in the park.
  - Water path: A canoe, kayak, and row boat path system through the wetlands.
- Wetland and wildlife areas.
- Preserve nature area.
- Lake
- Concession building
- Support facilities and areas:
  - Fishing piers
  - Overlooks
  - Wildlife blinds
  - Playground
  - Open play area
  - Entrance booth

C. PARK PLAN DESCRIPTION

1. General Description

The proposed park plan includes a total of 490 acres. Within that total is a 135 acre lake, and 90 acres of wetland and habitat area. The balance of the area contains land developable for a variety of recreational uses and facilities.

Table 4

PARKLAND AREAS

TYPE	ACREAGE
Lake	135
Forest Preserve	182
Wetlands	90
Uplands	83
TOTAL	**490**

The proposed park site is divided into four basic use areas. These include:

- Picnic and open play areas
- Beach area
- Wetland and habitat areas, including the Preserve.
- Lake area

These use areas are linked by an extensive path system as described below. A key factor in the layout of the facilities is the relationship of the uses and facilities to adjacent lands. These uses and facilities are proposed to be sited with consideration for minimizing potential visual and sound impacts on the neighbors, while providing an overall naturalistic landscape for the neighbors to view.

The final configuration of the land and water areas will be dependent upon two conditions. First, will be the extent to which the remaining aggregate reserves will be mined. Second, will be the ability of the Ottawa County Parks and Recreation Commission to work with the various mining operators to achieve the desired land and water configurations.

2. Detailed Description

a. ENTRANCE: A single boulevard entrance is proposed on the west side of the park at the Fillmore Street-Cottonwood Drive intersection. The entrance road is located on the Fillmore Street right-of-way which is about 1,100 feet long. It is terminated by an entrance ticket booth, gate and turn-around. The road is to be aligned to provide selective, dramatic overviews of the lake and beach area. (Figure 12E-E)

b. PICNIC AREA: A large area located along the south side of the development is proposed as a picnic area. This picnic area will include several group picnic facilities that can accommodate up to 300 people each and family picnic facilities. Supporting facilities include parking, pavilions, restrooms, playgrounds, and open play areas.

The final configuration of the picnic area will be influenced by the amount of aggregate material that can be removed from that portion of the site. In any event, it will consist of a series of plateaus and valleys with a total change in elevation of approximately twenty (20) feet. (Figure 12C-C)

c. BEACH FACILITY: A three (3) acre (150' x 900') sandy beach is proposed. This beach, with a grassed picnic area, will be enclosed for security measures. It has a capacity of approximately 1,500 people. Support facilities include adjacent picnic areas, beach house, boardwalk, sunning area, and parking for 600 cars.

The entire beach area can be shaped on the existing waste sand pile. The swimming area will need to be excavated to a desirable depth (to 12 feet) because the aggregate reserves are very shallow in this area. (Figure 11B-B)

d. BOAT LAUNCH: A boat launch for canoes, kayaks, row boats and small sail boats is proposed north and east of the beach area. It is to be supported by a small boat dock and a boat trailer parking lot.

e. WETLAND WILDLIFE HABITAT AREA: One of the premier features of this park will be the 90 acres wetland wildlife habitat area that is to be created by the mining companies and managed by the Ottawa County Parks and Recreation Commission. It is proposed that the mining companies develop these wetlands, in accordance with the Commission's development goals, to build a "wetland bank" and/or to receive mitigation credit.

It is proposed that these areas be shaped to create special aquatic and terrestrial habitats that will enhance fish, bird, and mammal environments. It is also proposed, as illustrated, that these habitats be designed to accommodate nature trails, fishing opportunities, and boating. To further enhance the habitat, an area is set aside that will limit human access to the area. (Figures 12 & 13)

In addition, the "Preserve", a 182 acre undisturbed wooded area with some wetlands, is proposed to be incorporated into the overall plan. This area, located between the lake and Grand River, provides a special opportunity to protect and manage a large wildlife area with importance to the overall Grand River Greenway. It also provides a naturalistic backdrop to the entire park development.

f. PATH SYSTEM: Five (5) types of paths are proposed for the project. The lengths of these paths are summarized in Table 5.

1) GREENWAY PATH: This paved path is part of the County-Wide Greenway Path System. This section of the path is proposed to link with future path systems and extends from 22nd Avenue on the north side of Fillmore Street through the southern part of the park to 12th Avenue. It then is to extend south along 12th Avenue to Taylor Street. (Figures 12 & 13)

2) NATURE PATH: This is a combination paved boardwalk and soft surfaced path that extends from the Greenway Path just east of the Park entrance, north to the Preserve area. It is proposed to meander through the Preserve area along the Grand River easterly to the north end of 12th Avenue and then extend south to connect with the Greenway Path. (Figures 11 & 13)

3) WETLAND PATH: This is a boardwalk path that begins at a point in the center of the park and meanders through the wetlands to the east side connecting with the Nature path along 12th Avenue. It provides opportunities to observe wildlife, enjoy the wetland environment and gain access to selected fishing areas. (Figures 12 & 13)

4) INTERIOR PATH: This is a paved path that links various use areas.

5) BOAT PATH: This water path extends from the boat launch area east of the beach through the wetland area to the private lake and boat rental area on the east side of 12th Avenue.

Table 5

PATH LENGTHS

PATH TYPE	LENGTH (Miles)
Greenway	2.0
Nature	2.5
Wetland	.8
Interior	2.0
Boat	2.7
TOTAL	10.0

g. CONCESSION/SHOP: A concession building containing several shops to provide food and supplies to park users is located near the park entrance overlooking the proposed beach. This building may also house the park offices and small conference rooms for the community.

h. LAKE: The 135 acre lake provides a large open water area with depths ranging from zero to twenty-five feet. The deepest areas are along the north side with areas bordering the wetlands being one to ten feet deep. This lake will provide opportunities for fishing, canoeing, sailing, and kayaking. It is also a significant scenic compliment to the overall character of the park.

i. PROPOSED PRIVATE RECREATION: The proposed recreation development east of 12th Avenue is viewed as a positive use in relation to the proposed park. Based upon the proposed site plan prepared by the owner, it will be a relatively low density use. It can also provide both services (non-motorized boat rental, concessions, and fishing

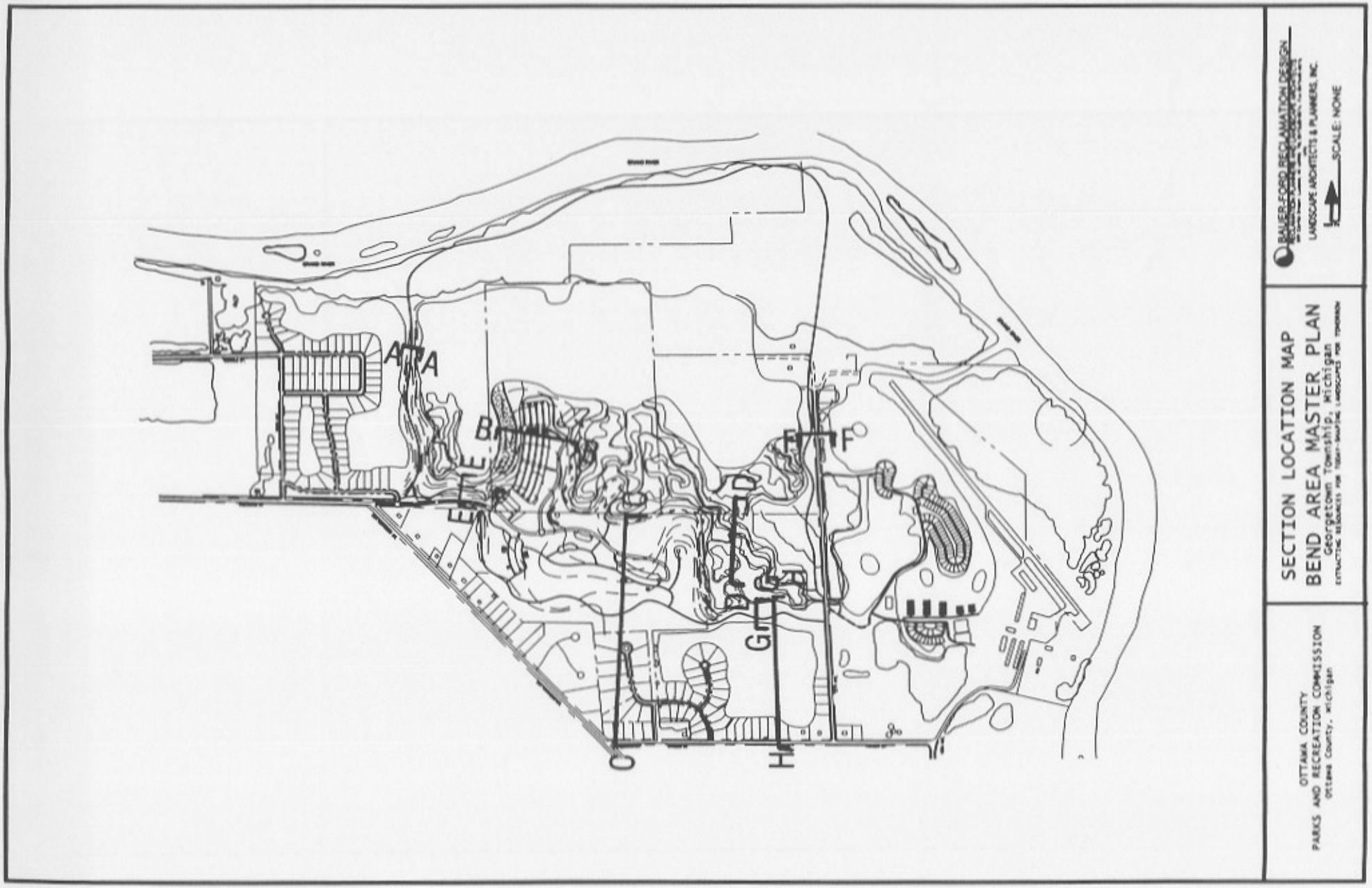
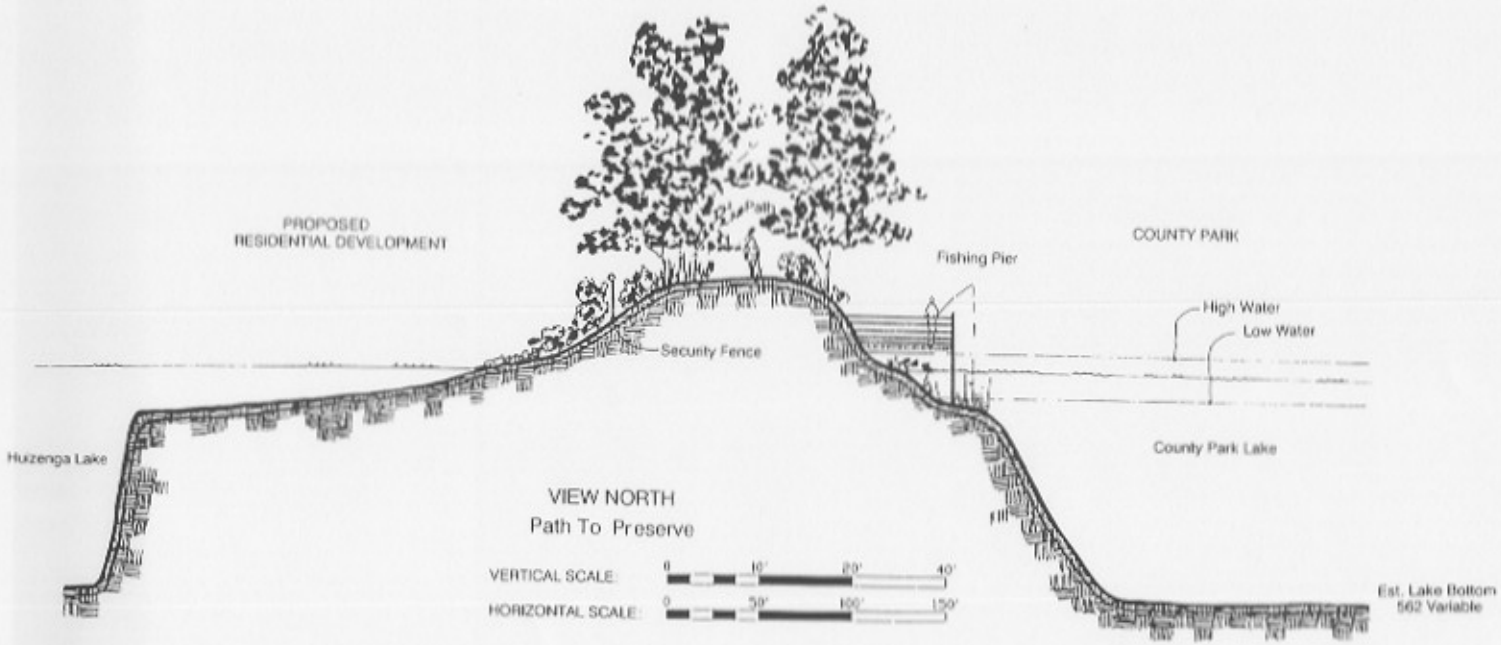
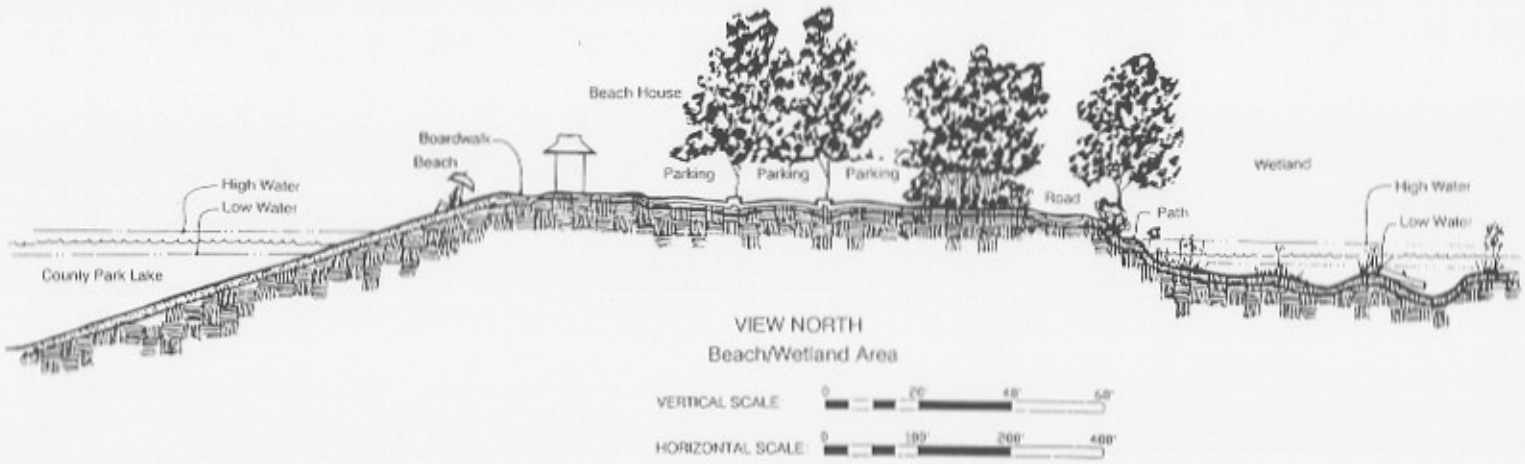

SECTION LOCATION MAP
BEND AREA MASTER PLAN
Georgetown Township, Michigan
OTTAWA COUNTY
PARKS AND RECREATION COMMISSION
Ottawa County, Michigan
BAUER-FORD RECLAMATION DESIGN
LANDSCAPE ARCHITECTS & PLANNERS, INC.
SCALE: NONE
A
A
B
B
C
D
E
E
F
F
G
G
H
H
O

FIGURE 10

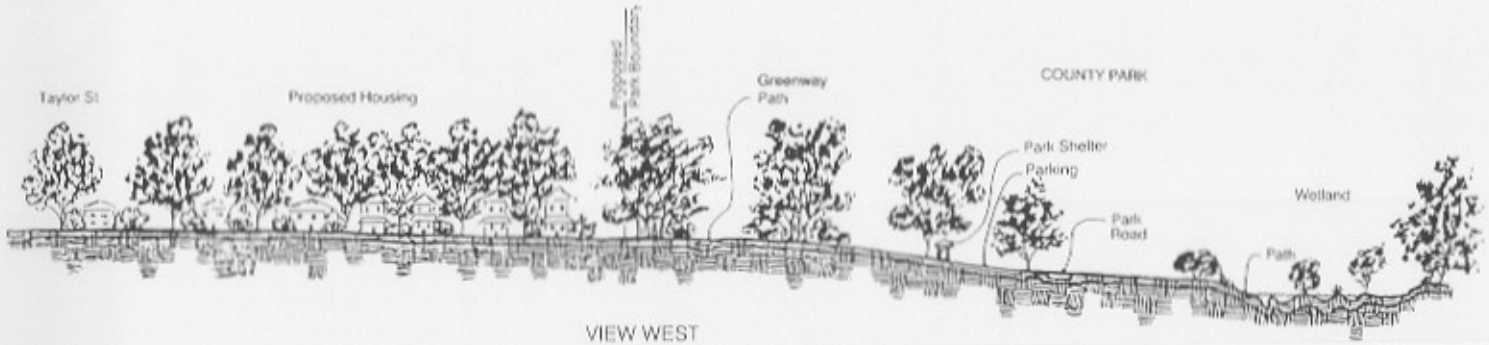


SECTION: A-A



SECTION: B-B

FIGURE 11

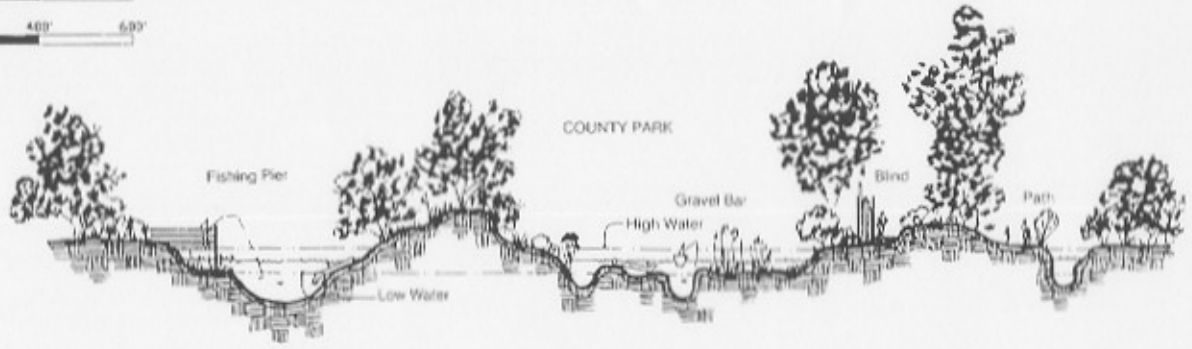


SECTION: C-C

VIEW WEST
Across Road Commission Land

VERTICAL SCALE: 0 50' 100' 150'

HORIZONTAL SCALE: 0 200' 400' 600'

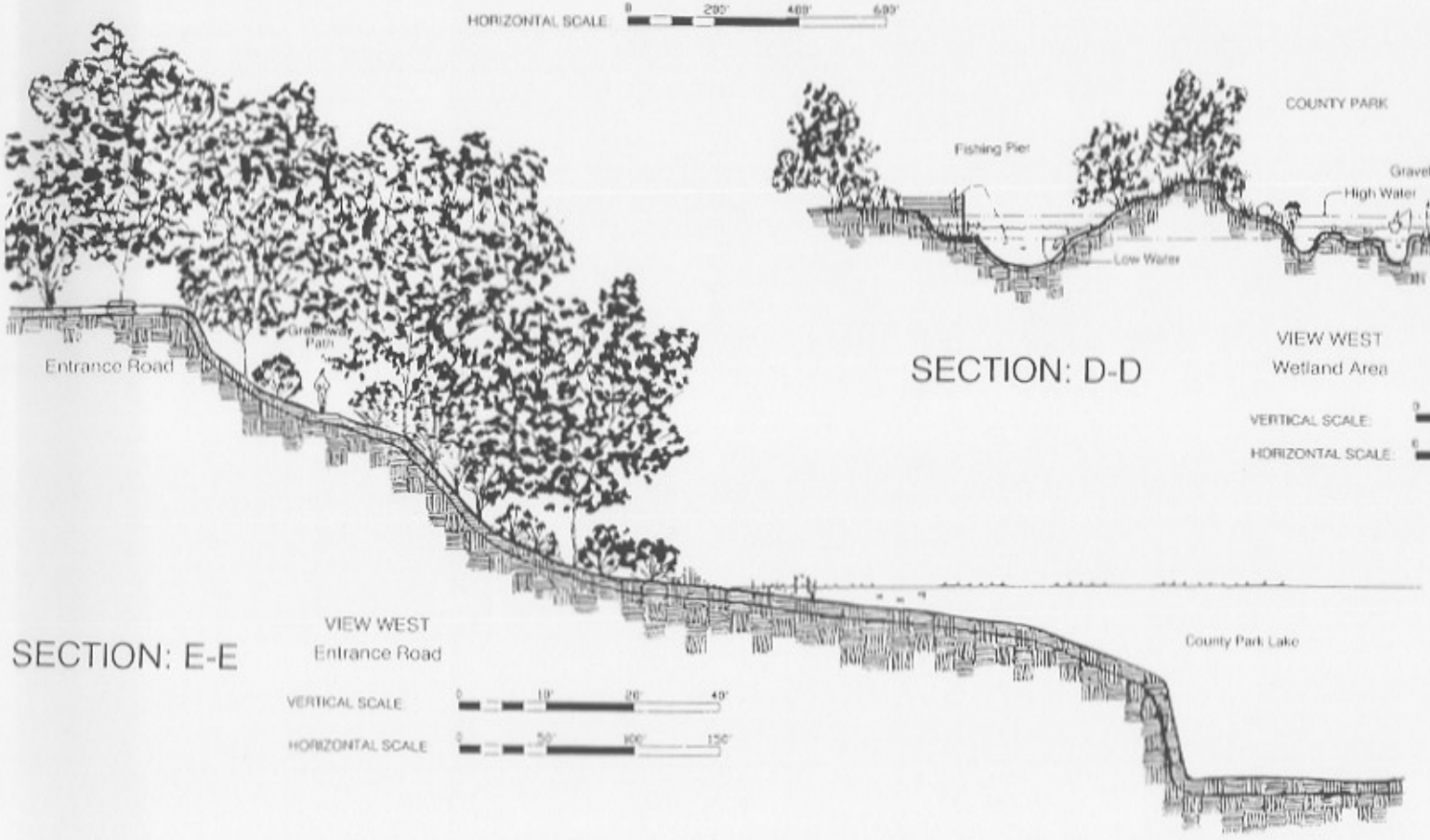


SECTION: D-D

VIEW WEST
Wetland Area

VERTICAL SCALE: 0 20' 40' 60'

HORIZONTAL SCALE: 0 100' 200' 400'



SECTION: E-E

VIEW WEST
Entrance Road

VERTICAL SCALE: 0 10' 20' 40'

HORIZONTAL SCALE: 0 50' 100' 150'

FIGURE 12

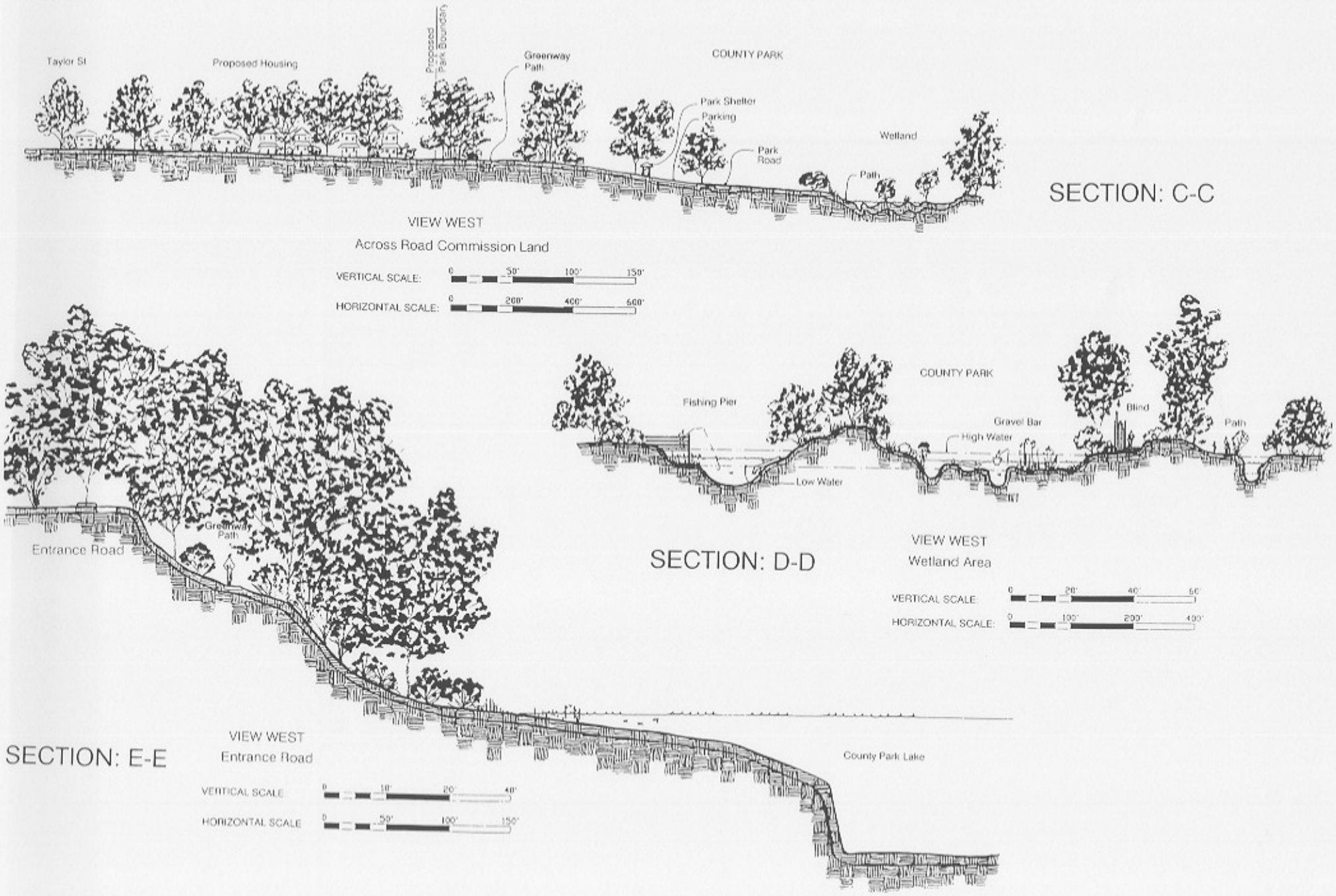

Taylor St
Proposed Housing
Proposed Park Boundary
Greenway Path
COUNTY PARK
Park Shelter
Parking
Park Road
Wetland
Path
SECTION: C-C
VIEW WEST
Across Road Commission Land
VERTICAL SCALE: 0 50' 100' 150'
HORIZONTAL SCALE: 0 200' 400' 600'
COUNTY PARK
Fishing Pier
Gravel Bar
High Water
Low Water
Blind
Path
SECTION: D-D
VIEW WEST
Wetland Area
VERTICAL SCALE: 0 20' 40' 60'
HORIZONTAL SCALE: 0 100' 200' 400'
Entrance Road
Greenway Path
County Park Lake
SECTION: E-E
VIEW WEST
Entrance Road
VERTICAL SCALE 0 10' 20' 40'
HORIZONTAL SCALE 0 50' 100' 150'

FIGURE 12

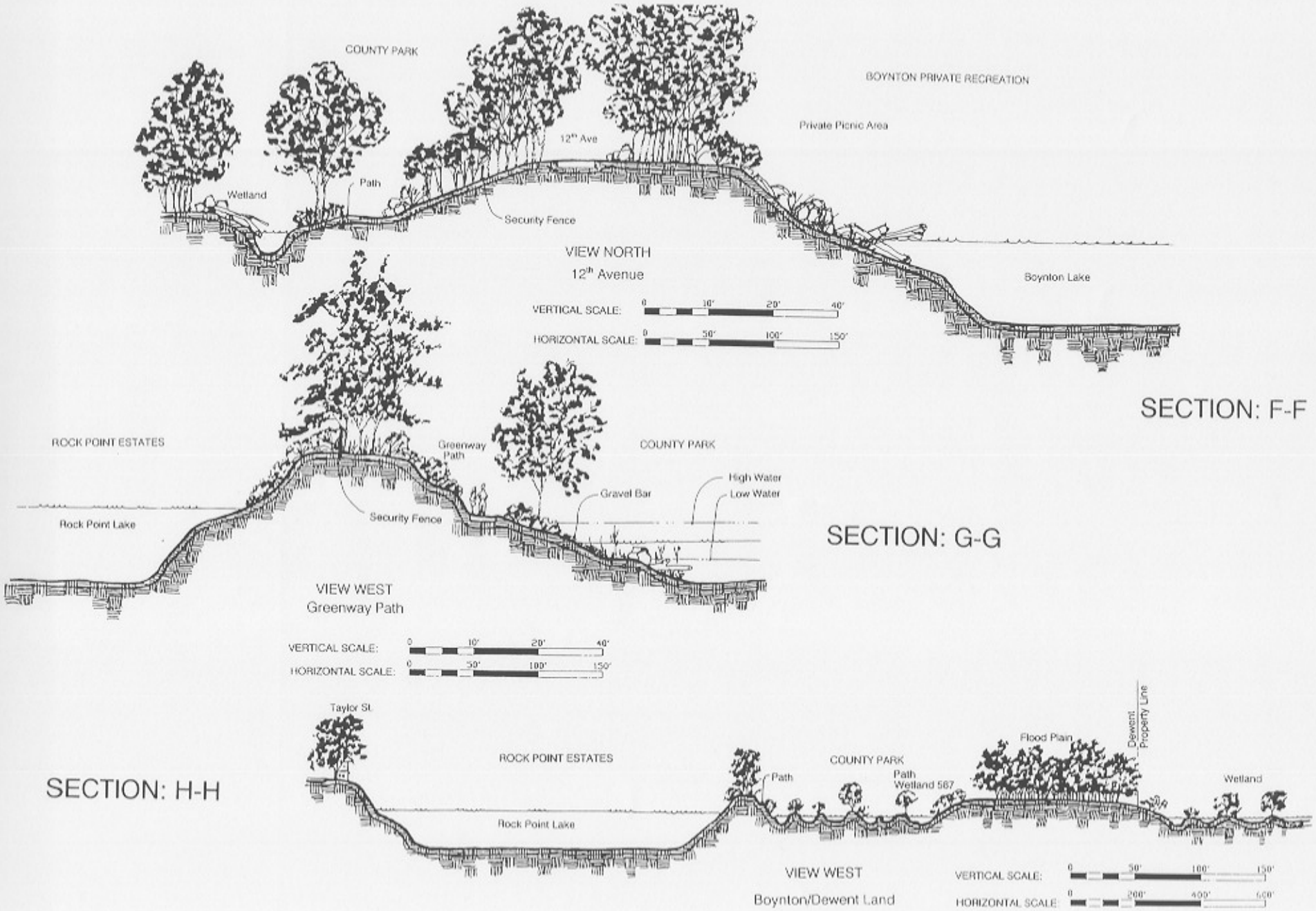

COUNTY PARK
BOYNTON PRIVATE RECREATION
Private Picnic Area
12th Ave
Wetland
Path
Security Fence
VIEW NORTH
12th Avenue
VERTICAL SCALE: 0 10' 20' 40'
HORIZONTAL SCALE: 0 50' 100' 150'
Boynton Lake
SECTION: F-F
ROCK POINT ESTATES
Greenway Path
COUNTY PARK
High Water
Low Water
Gravel Bar
Security Fence
Rock Point Lake
SECTION: G-G
VIEW WEST
Greenway Path
VERTICAL SCALE: 0 10' 20' 40'
HORIZONTAL SCALE: 0 50' 100' 150'
Taylor St.
ROCK POINT ESTATES
Path
COUNTY PARK
Path
Wetland 587
Flood Plain
Dewent Property Line
Wetland
Rock Point Lake
SECTION: H-H
VIEW WEST
Boynton/Dewent Land
VERTICAL SCALE: 0 50' 100' 150'
HORIZONTAL SCALE: 0 200' 400' 600'

FIGURE 13

supplies) and facilities (small lake along 12th Avenue that is isolated from the marina lake). For this reason, a culvert is proposed under 12th Avenue. This culvert would connect the small private lake and boat/supplier concessions with the park, wetland areas and lake; thus expanding the recreational opportunities for the users of both facilities.

j. SHORELINE DEVELOPMENT: The proposed shoreline is designed to enhance the natural character of the park. This is accomplished by creating an irregular shoreline by limiting the development of facilities along the waters edge and limiting access to the shoreline.

A single boat ramp is proposed northeast of the beach area. It includes a small parking area and a small pier/boat dock. In addition, several fishing piers and overlooks are sited around the lake and within the wetland area.

D. PARK BOUNDARY

The suggested park boundary was determined on the basis of the following criteria:

1. An area large enough to create and sustain a naturalistic landscape within an urban area.

2. An area large enough to provide a variety of activities within the context of a naturalistic setting.

3. An opportunity to control all or most of the lake shoreline.

4. An area in which the site can be secured from both a management and a public health, safety and welfare point-of-view.

5. An area that will provide a diverse landscape.

6. An area that has good access to public roads.

The suggested park contains approximately 490 acres of land and water. The Grand River borders the site from the Boynton river channel on the east to the west side of the Huizenga site. It is bordered on the east by 12th Avenue and on the west by the approximate location of the existing entrance to the Huizenga processing plant. The southern part of the park is bordered by Fillmore Road and residential properties.

VI. RECLAMATION

The reclamation of the project site will occur over a period of time throughout the remaining life of the mining operations. A significant amount of successful reclamation has occurred in both the Huizenga and Boynton properties. This work has focused primarily on shaping and stabilizing land for residential use. However, land and water areas on the Boynton lands east of 12th Avenue have been and are in the process of being prepared for a variety of recreation uses. This includes shaping of shorelines, stabilizing water levels, earth shaping, seeding and tree planting.

A. RECLAMATION GUIDELINES

1. SHORELINES

There are two aspects of the shoreline to be considered. The first is safety. In addition to stable soil and slope conditions, consideration should be given to shoreline slopes above, at, and below the water line. Figure 14 illustrates a suggested shoreline profile that deals with water seasonal fluctuation and below water safety ledges. Any existing shorelines can be shaped with a backhoe by pulling back the material to create the desired slopes.

A second consideration is to excavate portions of the shoreline to achieve a more irregular and naturalistic horizontal configuration.

2. USE OF WASTE SAND (FINES)

A significant amount of this material is stored on the west and southwest parts of Grand Rapids Gravel site. This material is unstable as a base for most buildings but is suitable as a base for parking lots, beaches, and other land forms. It is also an excellent material to use in filling and reshaping shallow water areas to create wetland areas.

3. TOPSOIL AND OVERBURDEN

It is in the interest of the Community and all parties involved to save ALL remaining topsoil and subsoil on the site. Even the subsoil will provide a better plant growing median than the porous aggregate base. This material should be used:

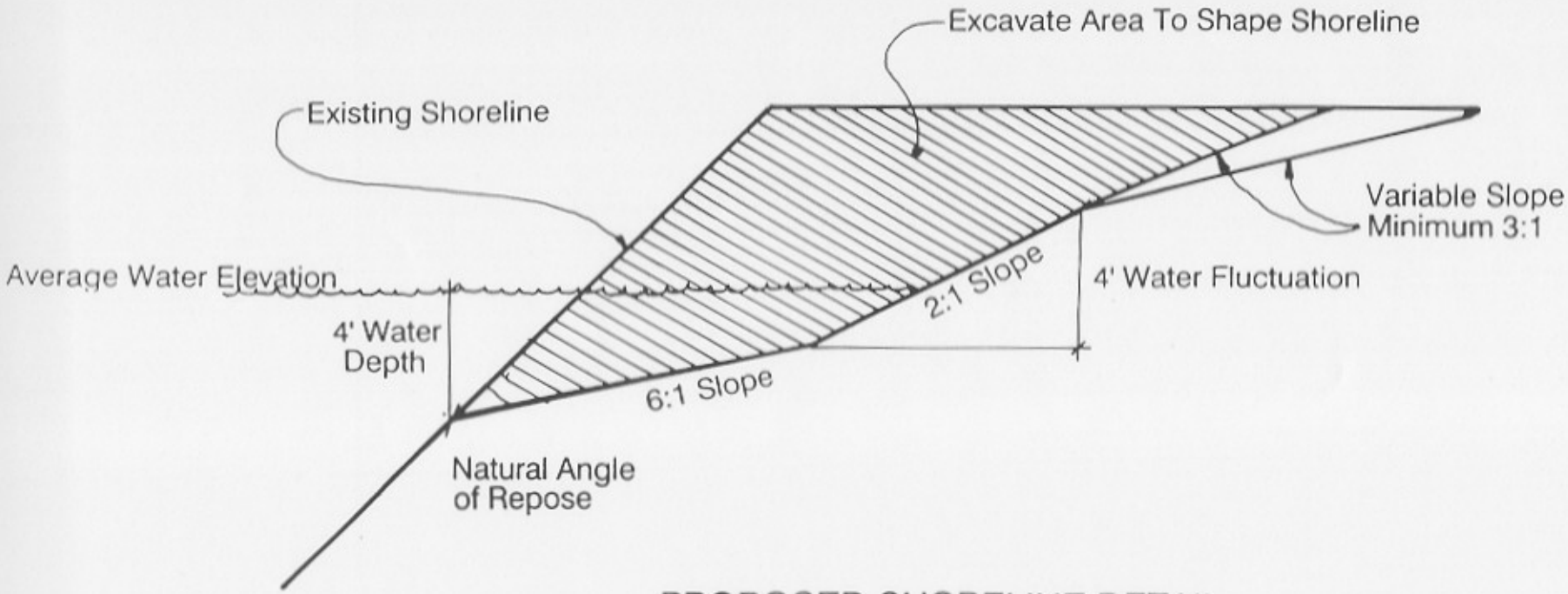
a. to cover all disturbed areas to depths of 4 to 6 inches.
b. in wetland areas under the direction of an ecologist to create special above and below water habitats.

4. WETLAND

One of the special opportunities presented by this site and these mining operations is the creation of a sizeable wetland area. These "wetlands" can be created within the context of existing mining operations taking advantage of existing on-site equipment and earth materials. While the following reclamation ideas set some specific guidelines to assure the end result, they take into account the recreational objectives of the project--specific details should be developed by an ecologist with a special background in aquatics.

- Create a series of islands that can be linked by a boardwalk and that can also be isolated from human intervention.

- Design water bottom and island elevations with consideration for the seasonal changes in the water table and in consideration of a ten-year flood frequency.



PROPOSED SHORELINE DETAIL

SCALE: 0 5' 10' 15'

FIGURE 14

- Design a boating channel of no more than two foot depth below the seasonal low water level.

- Create a variety of above and below water slope configures ranging from steep (2:1) to flat (50:1) slopes.

- Use a variety of materials to create special above and below water conditions ranging from sandy and rocky areas to nutrient-rich muck and topsoil.

- Create a wetland that provides a variety of land and water habitats at any given point of the year.

- Install a variety of fish structures throughout the wetland and lake.

- Transplant native wetland species from nearby wetlands.

5. REVEGETATION

In addition to transplanting and seeding native wetland species, a planned revegetation program should be established. Within the context of a long term sequential mining and reclamation development program, there is little need to plant large plant stock (over 18" high and 1' diameter) except in isolated situations. There are three advantages to this requirement:

a) lower cost
b) better survival rate
c) opportunity to plant a greater quantity of plants.

Recognizing the area will not be available for public use until mining operations have been removed from a major part of the site, the plant material will have an opportunity to become well established. Another factor to consider is management of a natural succession, particularly in wetland areas. The idea is to encourage natural revegetation of areas through the seed bank that already exists in some of the topsoil.

6. OFF-SITE DRAINAGE

An important issue in the reclamation process is to eliminate off-site drainage from direct access into the proposed lake. The plan illustrates that any potential off-site drainage can be directed to the proposed wetlands, which will serve as a filter for the lake.

7. TRUCK ROUTE

No gravel truck access should be permitted on 12th Avenue. Access from the Dewent property should be through the present Grand Rapids Gravel entrance on to Taylor Street.

8. SHAPING LAND AREAS FOR DEVELOPMENT

The plan developed for this site provides a general idea of how the site can be developed. More specific details related to both the horizontal and vertical configuration of the site needs to be developed. These details can only be based upon a more detailed and accurate topographic map of the site. With this information in hand, detailed grading plans can be developed and the final land form configurations of the site can be shaped by the mining companies–if this plan is available while mining operations are active on the site. The goal is to have the mining companies rough grade the site as an integral part of their

mining operations and throughout the remaining life of the operations.

B. TIMING

1. FACTORS THAT INFLUENCE TIMING

Any schedule for the mining and reclamation of this site is subject to a variety of factors that can speed up or slow down the activity. Primary factors include:

a. Production capacity of the operator.
b. Volume of remaining reserves.
c. Changes in market demand.
d. Changes in the local economy.

Other factors include:

a. Availability of mined-out areas for reclamation.
b. Mining procedures that can be used to enhance reclamation efforts.
c. County land acquisition efforts.
d. Preparation of detailed park development plans by the County.
e. Availability of funding.

2. SUGGESTED SCHEDULE

The following schedule is divided into five (5) year increments based on basic assumptions on the rate and progress of mining, upon the progress of any land acquisition agreements, and upon any landowner/county agreements regarding the development, ownership, and use of the wetlands. The schedule includes both mining company and Park and Recreation Commission activity.

a. Phase I (2000-2006)

1) Initiate discussions related to wetland banking concept.
2) Obtain detailed topographic photograph and contour map.
3) Initiate negotiations with land owners regarding the acquisition of lands (with continued rights of owners to extract sand and gravel reserves).
4) Begin mining DeWent property.
5) Prepare detailed site design, grading plans, and construction documents for Phase I and II.
6) Prepare Grant Applications for Phased Acquisition and Development Program (Annually).
7) Initiate wetland development in Boynton lands west of 12th Avenue, including planting of vegetation.
8) Initiate shoreline modifications along north side of lake.

b. Phase II (2007-2011)

1) Complete mining of DeWent and Grand Rapids Gravel.
2) Prepare Grant Applications for Phased Acquisition and Development Program (Annually).
3) Continue land acquisition efforts.
4) Complete rough grading of land areas and wetlands.
5) Initiate construction of perimeter fence.

6) Initiate construction of greenway path.
7) Initiate construction of wetland path (boardwalks) and support facilities.
8) Prepare construction documents for Phase III Development.

c. Phase III (2012-2016)

1) Complete mining of the Ottawa County Road Commission land and remove all mining equipment from the Grand Rapids Gravel and Road Commission land.
2) Construct beach, picnic areas, concession buildings, internal paths and parking lots.
3) Continue landscaping program.
4) Continue to install perimeter fence.
5) Install entrance boulevard/coordinate with Huizenga operations.
6) Complete all work in primary park area south of lake.

d. Phase IV (2017-2021) (Subject to completion of mining by Huizenga)

1) Construct nature path along west side of park through preserve and along west side of 12th Avenue south to greenway path.
2) Install culvert under 12th Avenue connecting Boynton Lake with wetland area.
3) Complete perimeter fence.
4) Complete construction of all paths.
5) Complete all landscaping.

VII. COST ESTIMATES

A. INTRODUCTION

The cost estimate for a development such as proposed in this project is affected by a variety of variables and assumptions. First, this estimate uses year 2000 costs. It is advisable for the County Park and Recreation Commission, in the development of annual budgets, to add a three (3) to five (5) percent annual inflation factor for work to be undertaken on this project. Second, it is assumed that the site, as proposed, will be rough graded and, in part, seeded by the mining companies as part of their reclamation efforts. Thus any earth work included in this estimate pertains to finish grading. Third, it is assumed all overburden, topsoil, and beach sand required to reclaim the site will be available on site. Fourth because the development of certain facilities is not likely for five to fifteen years, inflation, construction material costs, and labor cost variables can have a significant affect on the final costs; and fifth, cost efficiencies, particularly in relation to finish grading, may be negotiated with the mine operators.

B. COST ESTIMATE

The following cost estimate, based upon year 2000 costs, is divided into seven components. These include:

1. Entrance
2. Picnic Area
3. Concession
4. Beach Area
5. Wetland, including wetland path
6. Paths, excluding wetland path
7. Additional Improvements

The twenty (20) percent contingency is added to anticipate unexpected additions to or changes in the project and not a reflection of potential inflation.

The professional service fees relate to the preparation of design, engineering, ecological and permit documents. It does not include cost typically related to on-site construction; this is because the unique nature of this project makes it difficult to determine the extent and type of on-site construction inspections that will be required and who will be responsible for this work.

1. ENTRANCE

a. Road		
1) Divided 12' Lanes (5,000 SY)		
Site Preparation, base, asphalt	@ $25/SY	= $120,000
2) Curb - 1,800 LF	@ $20/LF	= $ 32,000
b. Landscaping		
1) Seeding 4.0 acres	@$2,000/ac	= $ 8,000
2) Trees & Shrubs 4.0 acres	@$6,000/ac	= $ 24,000
c. Utilities		
1) Lighting, 10 light poles	@ $2,000/ea	= $ 20,000
2) Wiring, 1,200'	@ $10/LF	= $ 12,000

d. Structures		
1) Gate House - One (1)	@ $10,000/ea	= $ 10,000
2) Entrance Sign - One (1)	@ $10,000/ea	= $ 10,000
3) Road Signs - Five (5)	@ $1,000/ea	= $ 5,000
	SUB TOTAL	**$241,000**
2. PICNIC AREA (50 Acres)		
a. Finish Grading	@ $2,500/ac	= $125,000
b. Landscaping		
1) Seeding	@ $2,000/ac	= $100,000
2) Trees & Shrubs	@ $3,000/ac	= $150,000
c. Pavement (Site preparation, base & asphalt)		
1) Roads - 8,700 SY	@ $20/SY	= $174,000
2) Parking - 15,000 SY	@ $20/SY	= $300,000
d. Structures		
1) Large Pavilion - Three (3)	@ $40,000/ea	= $120,000
2) Small Shelter - Two (2)	@ $18,000/ea	= $ 36,000
3) Restrooms - Two (2)	@ $100,000/ea	= $200,000
4) Overlook - One (1)	@ $15,000/ea	= $ 15,000
e. Equipment		
1) Picnic Tables - 300	@ $50/ea	= $150,000
2) Grills - 50	@ $300/ea	= $ 15,000
3) Trash Receptacles - 50	@ $200/ea	= $ 10,000
4) Playground - 1	@ $100,000/ea	= $100,000
f. Utilities		
1) Sewer - 4,000 LF	@ $18/LF	= $ 72,000
2) Water - 6,000 LF	@ $12/LF	= $ 72,000
3) Drinking Fountains - 10	@ $1,000/ea	= $ 10,000
4) Security Lights - 20	@ $2,000/ea	= $ 40,000
5) Wiring - 5,000 LF	@ $10/LF	= $ 50,000
g. Miscellaneous		
Signs, Barriers, Bollards	@ Lump Sum	= $ 50,000
	SUB TOTAL	**$1,789,000**
3. CONCESSION AREA		
a. Building - 10,000 SF	@ $100/SF	= $ 50,000
b. Pavements		
1) Road - 900 SY	@ $20/SY	= $ 18,000
2) Parking - 3,600 SY	@ $20/SY	= $ 72,000

c. Landscaping (4.0 Acres)		
1) Seeding	@ $2,000/ac	= $ 8,000
2) Trees & Shrubs	@ $3,000/ac	= $ 12,000
d. Miscellaneous	@ Lump Sum	= $ 15,000
	SUB TOTAL	**$175,000**
4. BEACH AREA (Includes Boat Ramp)		
a. Pavement		
1) Roads - 5,000 SY	@ $20/SY	= $100,000
2) Parking - 35,000 SY	@ $20/SY	= $700,000
b. Beach Area		
1) Bath house - One (1)	@ Lump Sum	= $500,000
2) Beach sand - 20,000 CY	@ $5/CY	= $100,000
3) Security Fence - 1,500 LF	@ $16/LF	= $ 24,000
4) Boardwalk - 1,000' x 12'	@ $20/LF	= $ 20,000
5) Lighting - 5	@ $2,000/ea	= $ 10,000
6) Equipment	@ Lump Sum	= $ 20,000
c. Utilities		
1) Sewer - 800 LF	@ $15/LF	= $ 12,000
2) Water - 1,000 LF	@ $12/LF	= $ 12,000
3) Wiring - 1,200 LF	@ $10/LF	= $ 12,000
4) Drinking Fountain - 5	@ $1,000/ea	= $ 5,000
d. Landscaping (15 Acres)		
1) Seeding	@ $2,000/ac	= $ 30,000
2) Trees & Shrubs	@ $3,000/ac	= $ 45,000
e. Boat Ramp	@ Lump Sum	= $ 20,000
f. Miscellaneous	@ Lump Sum	= $ 25,000
	SUB TOTAL	**$1,635,000**
5. WETLANDS (90 Acres)		
a. Shaping & Planting	@ $4,000/ac	= $360,000
b. Wetland Path (4,300 LF)		
1) Boardwalk	@ $80/LF	= $344,000
2) Bridges - 5	@ $30,000/ea	= $150,000
3) Overlooks - 2	@ $20,000/ea	= $ 40,000
4) Blinds - 2	@ $15,000/ea	= $ 30,000
5) Fishing Piers - 8	@ $20,000/ea	= $ 160,000
c. Miscellaneous	@ Lump Sum	= $ 40,000
	SUB TOTAL	**$1,124,000**

6. PATHS (Except Wetlands)		
a. Greenway - 10' asphalt, 10,600 LF	@ $20/LF	= $212,000
b. Interior Path - 6' asphalt, 6,400 LF	@ $18/LF	= $115,000
c. Nature Path - 13,200 LF		
1) Cinder - 6' wide, 6,200 LF	@ $12/LF	= $ 75,000
2) Shredded Bark - 4' wide, 7,000 LF	@ $8/LF	= $ 56,000
3) Boardwalks - 6' wide, 500 LF	@ $40/LF	= $ 20,000
4) Culverts - 6	@ $1,000/ea	= $ 6,000
d. Miscellaneous		
1) Rustic Benches - 200	@ $100/ea	= $ 20,000
2) Trash Receptacles - 100	@ $100/ea	= $ 10,000
3) Signs & Barriers	@ Lump Sum	= $ 12,000
7. ADDITIONAL IMPROVEMENTS	SUB TOTAL	
a. Pedestrian Culvert under Entrance Road with wing walls	@ Lump Sum	= $150,000
b. Canoe Culvert under 12th Avenue	@ Lump Sum	= $200,000
c. Boat docks - 2	@ $25,000/ea	= $ 50,000
d. Perimeter fence - 11,500 LF	@ $15/LF	= $173,000
	SUB TOTAL	**$513,000**
8. SUMMARY		
a. Entrance		$241,000
b. Picnic Area		$1,789,000
c. Concession		$175,000
d. Beach Area		$1,635,000
e. Wetlands		$1,124,000
f. Paths		$526,000
g. Additional Elements		$513,000
	SUB TOTAL	$6,003,000
	20% Contingency	$1,200,600
	SUB TOTAL	$7,203,600
	8% Professional Service Fees	$ 576,300
	TOTAL	**$7,779,900**

No land acquisition costs are listed in this report.