SITE SELECTION FOR A COMMUNITY AND CULTURAL CENTER ST. JOHN, U.S. VIRGIN ISLANDS

by

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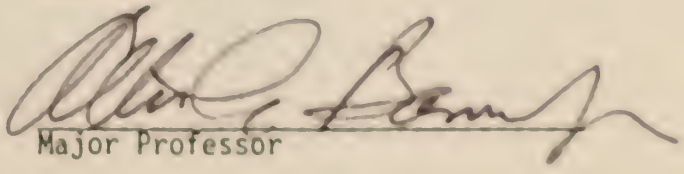

Major Professor

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INTRODUCTION

Chapter 1

INTRODUCTION

In the spring of 1979, a group of citizens from St. John, U.S. Virgin Islands presented a proposal to the National Park Service outlining major components of an island community and cultural center (see Appendix A). The desired site for the proposed facility was located within the authorized boundary of the Virgin Islands National Park, on land currently owned by the National Park Service. After reviewing the proposal, it was suggested by the National Park Service that prior to any decisions on the part of the community or the park, a study of tne proposed project be conducted and a number of site alternatives be recommended. As a result, a task directive (see Appendix B) outlining the method and scope of the study was written and a task force to conduct the study was formed.

Since the proposed facility would have an impact on the citizens of St. John, Virgin Islands National Park, and the overall planning of public facilities on St. John, the task force was composed of individuals representing these major interest groups. It was the responsibility of each task force member to provide input and guidance, as well as, the views and opinions of their respective groups.

It is interesting to note that two basic attitudes, pro-park and anti-park, were observed during the survey phase of this study conducted in the Virgin Islands. The general public attitude is not supportive of the Virgin Islands National Park. Much of this feeling stems from the

manner in which the land was obtained and donated to the Government for use as a park. The people feel that the park was created with little public awareness. Local residents of St. John feel that the park severely inhibits their overall development potential (see Appendix E).

Conversely, the pro-park contingency feels that the existence of the park preserves a small segment of the natural resources and scenic quality for the enjoyment of both visitors and residents alike.

While these attitudes did not affect the analytical portion of the survey and analysis of site alternatives and recommendations, they will have impacts on the final decisions made in site selection.

In preparing the directive, the task force realized the importance of planning beyond the development of site alternatives (encompassed in the study) and developed an overall planning and analysis framework. It has been simplified as follows:

1. Problem Identification: Based on input from each interest group, collective needs would be established and project goals established.
2. Program Development: Based on the expressed needs a program describing the facilities would be developed.
3. Resource Analysis: In order to locate potential sites, an islandwide resource inventory would be prepared.
4. Development of Site Alternatives: Based on the criteria set forth in the program and the information obtained in the resource analysis site alternatives will be generated.
5. Site Selection: Based on the alternatives, site specific analysis and impact statements would be prepared. More detailed impact statements regarding the use as related to

the site would be prepared. On completion of this phase a site can be selected.

6. Design Implementation and Funding: Based on the finalization of the design program, selection of a site, and securing of building funds, work on the physical design and method of construction can be determined.
7. Building Phase: This segment of the project is determined by the preceding phase, and would include all aspects of building the physical structure or structures.
8. Operation and Maintenance: Although this is the ultimate goal of any building project, it is important that consideration for the operation and maintenance should take place early in the project, more specifically during the final development of the program.

While the scope of the study takes the project through the fourth phase of this framework, development of site alternatives, it is important that the process of selecting site alternatives is responsive to the needs expressed in the program and the natural environment of St. John.

In order to accomplish this, the general framework was expanded and detailed in the following phases: inventory and analysis and development of site alternatives. Inventory is the gathering and analysis of facts in order to derive a program of development and site analysis. Site alternatives include areas which will need further consideration and evaluation but have presented interesting potentials for development.

To further clarify the results of this study, it is important to stress that the research and development of site alternatives was produced for and in conjunction with the National Park Service. In order to finalize the thesis document, the addition of a site alternative (the National Park Service Trade Alternative) was included and recommendations regarding site selection were made. Note that this portion of the study goes beyond the scope of the study prepared for the National Park Service and in no way represents their views or policies.

2

THE INVENTORY

Chapter 2

THE INVENTORY

The purpose of the inventory is to obtain and document basic data which will support the generation of site alternatives and future recommendations. This information falls into two major categories: social and cultural resources and natural resources.

Social and cultural resources guide the development of the preliminary program which sets forth the requirements of the proposed facility. In order to establish the parameters of the preliminary program, information from the three major interest groups was compiled and evaluated. This information is discussed in Part One under the headings of The Historic Development of St. John, Land Use and Planning in the Virgin Islands and St. John, Community Needs, and National Park Service - Land Management Policies.

The second segment, Part Two of the inventory, represents the documentation and the analysis of the natural resources of St. John. Natural resource areas fall under the headings: Geology and Hydrology, Soils, Vegetation, Slope, and Visual Resources. The analysis or summary of this data, indicates areas which possess the fewest resource limitations for development.

2

THE INVENTORY

PART ONE

SOCIAL AND CULTURAL RESOURCES

The Historic Development of St. John

Location

In order to establish the regional context of the Virgin Islands, they must first be looked at as part of the Caribbean; a general term applied to the Antilles Island chain and the Caribbean Sea. This island chain curves its way from the Yucatan Peninsula of Mexico to the northern coast of Venezuela, South America and contains two major divisions: the Greater Antilles and the Lesser Antilles (see Figure 1). The Greater Antilles, to the west and closest to the Yucatan, include the larger islands of Cuba, Jamaica, Puerto Rico, and Hispañola. To the east of Puerto Rico the Lesser Antilles begin with the Virgin Islands and include thousands of small islands and cays which curve southward to the coast of Venezuela. The Antilles form the dividing line between the Atlantic Ocean to the north, and the Caribbean Sea to the south.

The Virgin Islands rest on a great underwater shelf which extends 100 miles eastward from Puerto Rico (St. Croix is not included). The islands lie in a double chain separated by the Sir Frances Drake Channel with the 53 United States islands and cays to the south and west, and the 36 British islands to the north and east. The major U.S. islands include St. Croix (84 sq. mi.), St. Thomas (28 sq. mi.), and St. John (19 sq. mi.) (see Figure 2).

Cultural and Historical Development

The first settlers of the West Indies were Indians who migrated north by sea from South America. They pushed north, hunting and fishing, until reaching St. Thomas sometime during the 5th Century B.C. Little


ATLANTIC
OCEAN
GULF
OF
MEXCIO
MIAMI
1200 MILES
BAHAMA ISLANDS
CUBA
CUBA
YUCATAN
GREATER
ANTILLES
JAMACA
HISPANOLA
PUERTO RICO-
VIRGIN
ISLANDS
CARIBBEAN
SEA
LESSER
ANTILLES
VENEZUELA
THE CARIBBEAN
NORTH
no scale

Figure 1

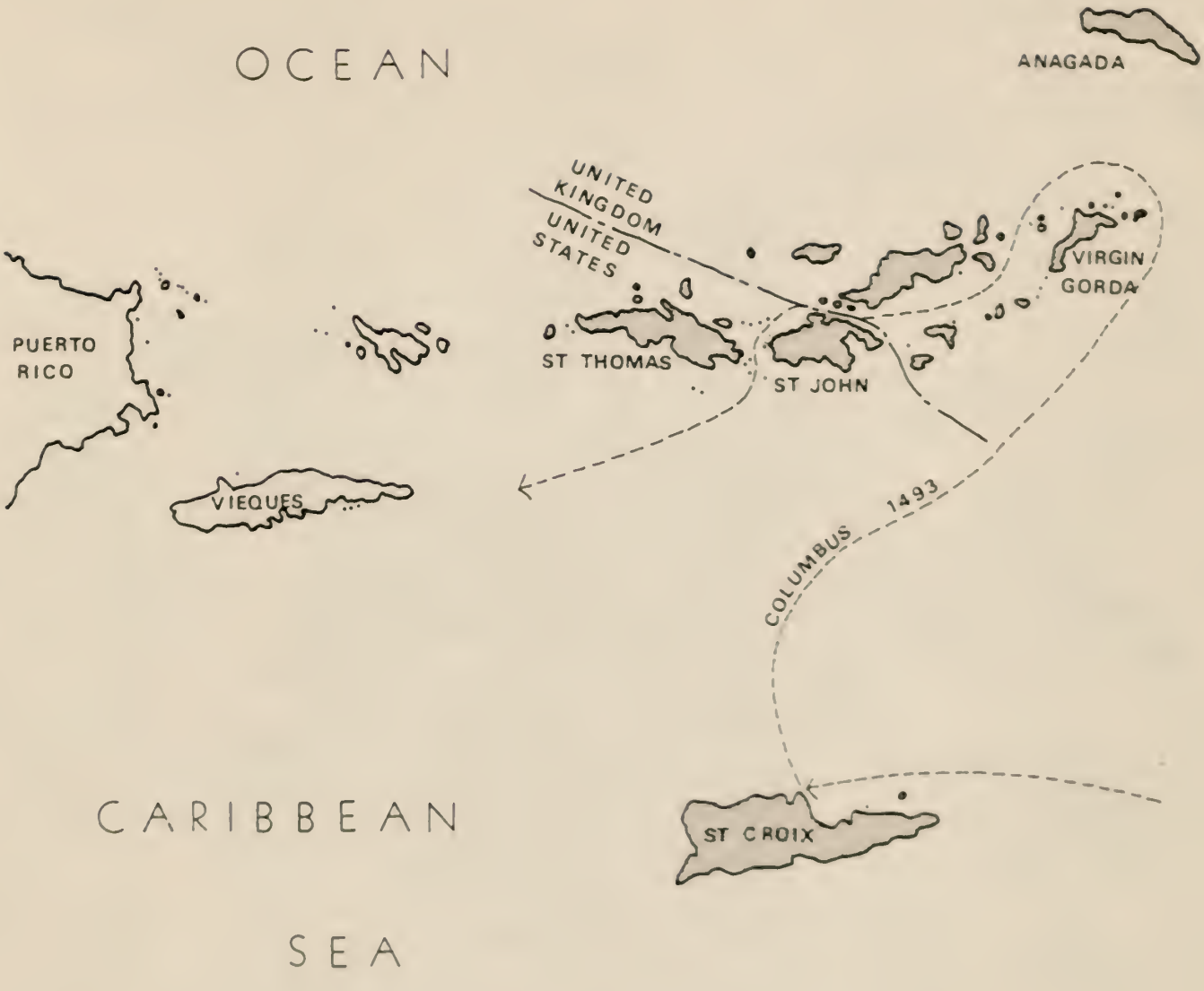

ATLANTIC
OCEAN
ANAGADA
UNITED KINGDOM
UNITED STATES
VIRGIN GORDA
PUERTO RICO
ST THOMAS
ST JOHN
VIEQUES
COLUMBUS
1493
CARIBBEAN
SEA
ST CROIX
NORTH
no scale

Figure 2

is known about these tribes or their successors the Arawaks. The Arawaks invaded the Lesser Antilles from Venezuela about the time of Christ, introducing agriculture and pottery. As they migrated to the north and west they occupied most of the islands, primarily the larger ones, by the end of the first millenium (22).

During the period 1000-1500 A.D., a third group of Indians called the Carib (from which the term Caribbean came) migrated northward. Unlike the peaceful, Arawak, the Carib tribe, was aggressive and cannibalistic. Their drive northward stopped short of Puerto Rico. Artifacts which have been found (mainly pottery) were most likely made by captive Arawak women and indicate Carib occupation approximately 100 years before the arrival of Columbus (19,22).

On his second voyage to the new world in 1493 Columbus discovered the Islands naming them the Virgin Islands "Las Once Mil Virgenes" after the legend of St. Ursula and the 11 thousand Virgins of Cologne. On arrival at St. Croix he sent a landing party ashore for water and food only to be driven back by a group of hostile Caribs (19,22).

It is not known for certain if Columbus actually landed on St. John, however, he did name the island in honor of St. John Chrysostom whose feast day had just passed (16,22).

After this first European discovery of the Lesser Antilles they were passed over in the first colonization efforts in the Caribbean and remained uninvolved during that period of history. As Columbus continued his voyage he reached the island of Hispanõla (one of the Greater Antilles, now known as the Dominican Republic) where he founded the first European settlement (22).

New settlements quickly spread to all the Greater Antilles. During the 16th century need for a homebase to support shipping and trading expeditions for tropical products or Peruvian silver was stimulated. By the mid 16th century the trading and shipping activity attracted the attention of pirates, smugglers, and privateers forcing Spain to ship in convoys and build large and powerful fortifications at strategic points. This action discouraged other Europeans from colonizing. Consequently establishment of non-Hispanic colonies did not occur until the 1630's when Dutch, French, English and later the Danes colonized the eastern Caribbean Islands not occupied by Spain (17,22).

The first successful colony was established by the Danish West Indies Company in 1672 on St. Thomas. About the same time the British were settling nearby Tortola and tried to exclude other countries from settling on other islands. In 1719 the Danes slipped settlers onto St. John's south and east sides, away from British observation. Within 10 years St. John was completely occupied by planters (17,22).

As the Danes increased their possessions, with the addition of St. Croix from the French, they invited colonization by settlers having other than Danish background. As a result, St. Croix became predominantly English and St. John Dutch (17,22).

European nations placed a high value on possessions in the West Indies. This competition caused a period of conflict. During this period, Britain utilized its naval power and obtained control of most of the islands. Since Denmark had aligned itself against Britain during the Napoleonic era, the British occupied the Danish Islands twice in the early 1800's (17).

Establishment of Plantations was extremely difficult due to the heat, disease and lack of men and tools. Those who survived the voyage from Europe often died later either from disease contracted while on board ship or from unfamiliar tropical disease. Most of the European laborers were sent to the Virgin Islands as a result of their indebtedness or crimes and had no desire to clear the jungle or raise tobacco (17).

In the mid 18th century most island planters turned to sugarcane as their main crop and used slaves imported from West Africa for their labor force. The islands became known for sugar and rum (an easily made by-product of sugar processing). They also became a major center for slave trade, exporting primarily to the U.S. and some to Europe (17,22).

On March 31, 1917, the present Virgin Islands including St. Thomas, St. Croix, St. John and other numerous islands and Cays were purchased from Denmark by the U.S. The U.S. purchased the Virgin Islands for its strategic military location and established the U.S. Naval base on St. Thomas. Most activity in the U.S. Virgin Islands was located on St. Thomas with some development on St. Croix (17).

In 1930 a National Park Service report sited the pristine beauty of St. John. In 1956, Congress established the Virgin Islands National Park and authorized acceptance of 5,000+ acres of land donated by Jackson Hole Preserve, Inc. and Caneel Bay Plantation, both owned by Lawrence Rockefeller (see Appendix D).

More recently many of the islands in the Caribbean have been promoting independence. Many have achieved their goal. Other islands have maintained ties with their mother countries while functioning under a self governing territory or commonwealth. These islands include the

U.S. Virgin Islands as well as French, Dutch, and most of the British Islands (22).

Land Use and Planning in the Virgin Islands and St. John

The current trend of development in the U.S. Virgin Islands has been that of rapid growth. This growth has taken place primarily between 1960 and 1975. It has been estimated that during this fifteen year period the population has increased 180% or more.

	1960	1975	1980
St. Thomas	16,201	44,723	50,955
St. Croix	14,973	45,611	53,764
St. John	925	2,273	2,556
	32,099	92,607	107,273

Recently this rapid growth trend appears to be stabilizing and moderate growth is expected through the year 2000. This rapid growth primarily residential, has caused a general lack of adequate schools, public facilities, public services, and utilities (10).

Immigration has played an important role in population increases. With increased tourism there have been marked increases in commercial and governmental jobs. This situation has attracted job seekers from "down island" (Tobago, Martinique, Barbados, etc.). While immigration statistics are sketchy, it is estimated by educational statisticians and island administrators (9,14,21) that at least 30% of the children enrolling in public schools are immigrants. However, it was also stated that a more realistic figure would be between 60-70%. This factor alone accounts for much of the overload on public facilities and programs. In

addition to immigrants from down island, continentals and foreign immigrants also make up a large segment of newcomers. This particular segment tends to be made up of older, retired people without children of school age (14,23).

In order to better plan for future growth, the Virgin Island Government has begun to prepare three separate, yet integrated, comprehensive plans; one for each island. These plans are scheduled for completion in three years (mid to late 1982) (18). In June, 1977, Land Use and Housing Elements (10) was published providing the groundwork for preparation of the comprehensive plans. This document outlines the basic development concepts which are utilized at the present in making planning decisions. It has been noted that the Virgin Island Government advocates "land capacities" (the capability of land to accommodate development). In the past, there has been intensive development on agriculturally zoned lands. Areas possessing delicate resources have been rapidly developed in a disorganized and sporadic manner creating conflicts between development and natural features. Development activities have caused irreversible damage to delicate marine areas by creating runoff and siltation (10,19). Since land which is capable of supporting development is scarce, cluster development is encouraged (10).

Due to the unique planning situation, dealing with three islands and one government, planning districts have been established. These planning districts are sub-planning areas within each island. They encompass, as closely as possible, geographic areas with related growth and development characteristics and form a smaller aggregate for evaluation and planning.

St. John

St. John has four sub-planning districts. Each of these areas, while being an important part of the island system, have certain unique aspects (10).

1. Cruz Bay Planning District

Cruz Bay is the port of entry on St. John and largest of the two main population centers. The district contains 1,871 acres and a population of 1,800 to 2,000 (10).

Existing facilities include (13):

1 - park (Cruz Bay Park)
1 - beach
2 - playground (school - NPS)
2 - baseball diamonds
2 - tennis courts (lit)
1 - grade school
1 - jr. high school
1 - police station
1 - fire station
1 - post office
1 - health clinic
- St. John government house
- U.S. Customs House
- other Virgin Island Governmental offices (scattered)
- solid waste disposal area and public works

Utilities include electricity from St. Thomas by cable and an auxiliary backup generator on St. John. The public water and sewage disposal systems are limited. Solid waste on St. John is currently being disposed of by an incineration and landfill operation at Guinea Gut. Since facilities on St. John are limited most business is conducted on St. Thomas (10,14,18).

Building permits issued from 1970 to present indicate the growth trend is continuing with much residential growth occurring to the south of Cruz Bay at Chocolate Hole and Great Cruz Bay. Signs of new development are also visible as far south as Cocoloba Cay, Fish Bay and Reef Bay (19).

In addition to single family residential development a condominium development has been proposed on Gallows Point in Cruz Bay (18).

2. Coral Bay Planning District

Coral Bay, the second largest area of concentrated population, contains 1,223 acres and has a population of between 250 to 300 persons (10).

Existing facilities include (14):

1 - grade school

1 - police station

1 - mobile health care unit

1 - fire station

1 - recreation complex with
  1 baseball field - seating approximately 250
    toilet and shower facility
  1 lit basketball court with bleachers
    (all facilities designed for the physically impaired)

no public sewage disposal or water

3. East End Planning District

East End Planning District is the smallest district with only 647 acres and an estimated population of 30. East end has no schools, public facilities or utilities (10).

4. Central Planning District

This area is the largest single district, including 8,741 acres of land and 49 permanent residences. There are no schools, public water

or public sewage disposal systems. Electricity is available throughout (10,22).

With major growth occurring in Cruz Bay, it is estimated that the overall population in Coral Bay is dropping slowly (10). Many local St. Johnians remember when Coral Bay and Cruz Bay were similar in population and commuting between the two communities was by foot and donkey. Commuting to St. Thomas was by small boat (14). However, with the introduction of the ferries, automobiles and the consequent surfacing of roads, travel time between the two centers has been reduced to only 20-30 minutes. Cruz Bay has grown quickly as a result of being the initial contact point of visitors. Coral Bay has experienced a slow population drain.

Coral Bay is rural in character and possesses beautiful views of Coral Bay Harbor and the surrounding mountainsides. It is foreseen that as Cruz Bay reaches its growth zenith, Coral Bay will begin to see increases in development (14).

The entire central district is located within the boundaries of the Virgin Islands National Park. In 1975, 6,093 acres were federally owned, 10 acres were owned by the Virgin Island Government (22) and 2,638 acres were privately held. These figures have not significantly changed. All federally owned lands are accessible to the public and provide the following public facilities:

- camping - Cinnamon Bay
- hiking trails
- nature study programs
- historic programs at restored sugar mill ruins
- management and maintenance of park lands and roads

- sewage and solid waste disposal
- water
- law enforcement of park lands and waters (5,11,19,22)

Transportation. As mentioned earlier, Cruz Bay is the port of entry for St. John and the initial contact point for anyone arriving or departing by public transportation. Transportation between St. Thomas and St. John is limited to public ferry or privately owned boats. Island residents and park visitors make up the primary users of public transportation. Other visitors to St. John include day visitors from cruise ships and tours out of St. Thomas. They arrive by boat at the National Park Service dock and are transported to Trunk Bay by prearranged taxi. They return to St. Thomas in the same fashion (12).

Transportation on the island is provided by public taxis which are either open safari type trucks, or smaller taxis for hire by groups (2-4). The safari busses run on an hourly schedule during daylight hours between Cruz Bay and Maho Bay and Cruz Bay and Coral Bay. They serve the bulk of public transportation needs on St. John, as well as, transporting island children to and from school. Other means of travel on St. John are limited to personally owned vehicles.

Summary

Growth on St. Thomas has rapidly spread east to Tutu and Red Hook. As rural areas for development become scarce on St. Thomas, it is predicted that St. John will experience the overflow. Some evidence of this has already been experienced in the relocation of St. Thomaians to St. John in order to escape the more urban environment (10).

authorized park boundary
federal land
offshore sea area
public land
waterfront
private land
r1 r2 r3 B

1 planning districts

Zoning & Land Use
St. John
Plate I

It is realistic to conclude that growth on St. John will continue at a slower rate than on St. Croix or St. Thomas due to its geographic and economic isolation. However, growth is predicted to slowly increase placing additional demands on St. John's environmental and community resources. Community needs are increasing and resulting in inadequate facilities. It is the concern of the Virgin Islands Planning Office that the location of any proposed facilities be mindful of future growth and population distribution, as well as, of limited land resources (see Plate I).

Community Needs

Background of Planning on St. John

In 1975 a group of St. Johnians joined togetner to form the Overall Planning Committee of St. John. Their planning effort was directed towards two basic concerns: to encourage controlled development and growth and provide needed community facilities and services for St. Johnians (13). A consultant from the Virgin Islands Department of Conservation and Cultural Affairs assisted in the community planning effort. While much of the information gathered is now outdated, many community needs sited at that time still prevail.

More recently, another group of citizens formed a committee to study community needs. The major objectives of this committee, the Citizens Ad Hoc Planning Committee, include: 1) Identify and define major community needs; 2) Establish the scope of needed public facilities, and 3) Secure adequate sources of funding for project implementation (see Appendix A). Based on information obtained from the 1975

effort the committee proposed a multi-use facility focusing on educational, cultural, and social services. In order to more accurately identify the type and location of the facility, it was determined that updated information was needed. The task force contacted representative groups, organizations, and agencies in order to acquire the necessary data.

Education on St. John. Currently 616 students from St. John are enrolled in public schools (9). A total of 550 students attend grades kindergarten (hereafter referred to as "K") through ninth grade in St. John schools and 66 students attend grades 10, 11, and 12 in St. Thomas (9) (see Appendix D). They commute daily by ferry to high school in Red Hook. In addition, 6 students attend private schools on St. Thomas and either commute daily or live at school (9).

Currently, four new schools are being planned by the Department of Education; two for St. Croix and two for St. Thomas. No new educational facilities for St. John are currently planned. However, once the proposed schools have been completed, a facility for St. John may be possible (9). Mr. Komives, a representative of the Department of Education felt that within a proper timeframe a new school for St. John was feasible. This positive attitude is due to two major factors:

1. Adverse effects on high school students who must commute each day to St. Thomas.
2. The existing structure and adjacent uses present serious problems which hinder effective use. They include (2,9,13,14):
   a. Excessive noise created by activities outside buildings.

b. The current deteriorated condition of buildings.

c. Location adjacent to two thoroughfares.

d. Overcrowding with no room for expansion.

While numbers of students attending high school lack the significance to warrant a separate facility, the Department of Education has indicated that they would support a single facility housing grades K through 12. This approach is responsive to both areas of need.

Vo Tech and Adult Education Programs. Currently the Department of Education conducts a small adult education program on St. John. Programs consist primarily of basic training for the GED exam (certificate of high school graduate competency). Vo-Tech operates out of the high schools and therefore has no direct effect on existing school facilities. If a high school were built on St. John, Vo-Tech programs would most likely continue to operate through St. Thomas high schools (9).

Social Welfare. Social Welfare is currently involved in socio-recreational programs for the elderly and handicapped. They include activities for the visually impaired, instruction in nutrition, a hot meals program, and handicrafts (21). Social Welfare programs are experiencing difficulty mainly related to availability of facilities (13,21). Currently islanders are transported to the Horace Mann School (Head Start Center) at Calabash Boom for the programs (13,21,23). Attendance has been hampered due to difficulty in getting there (21). Other problems include lack of space and inadequate cooking facilities. The hot meals program is the same as "Meals on Wheels" however, the food is transported to Calabash Boom and served there instead of being

delivered to individual homes (21,23). Accessibility is the lingering problem compounded by inadequate kitchen facilities. Existing cooking facilities are also inadequate for existing headstart programs (Community Action Agency) (23).

In addition, Social Welfare is involved in an active counseling program and finds it's hampered due to lack of facilities such as counseling rooms and office space for administration and safe keeping of confidential files (21).

Community Action Agency Programs. In addition to programs conducted by the Department of Social Welfare, the Community Action Agency provides many programs which include: Headstart, Youth Development, Office of Volunteer Services, Health Outreach, Family Education, Alien Emphasis, Information and Referral, Senior Community Services Employment, Retired Senior Volunteers, Homemakers and Energy (23).

As cited by the St. John Director of Community Action, two major program areas are in need of facilities; the programs for Senior Citizens and Youth Development (23).

Senior Citizen Programs. Presently there are an estimated 200 senior citizens on St. John. A fluctuating 20-40 people are actively involved in senior citizens programs and activities held at the Horace Mann School (Head Start Center) at Calabash Boom. The number fluctuates with relationship to the particular activity (23). The senior citizens travel to Calabash Boom from all parts of the island (21,23).

Problems surrounding the Calabash Boom facility include poor accessibility due to limited transportation and remote location, lack of space for many activities, inadequate kitchen facilities, and lack of

space for growing and cultivating garden plots and flower beds (21,23). There has been an expressed interest, by program participants, in expanding gardening activities (12) (see Appendix A).

Youth Development Programs. Youths between the ages of 4 and 19 may enroll in Youth Development Programs. Activities range from educational and recreational to field trips. Participation ranges from between 60 to 100 persons and are conducted by youth directors (usually high school students) (23).

Currently, facilities such as playgrounds and surfaced areas for sports activities are limited to an asphalt area adjacent to the Community Action offices and Fire Station in Cruz Bay. This area also doubles as a parking lot and has no shade, shelters, or play equipment of any type. The current Community Action administrative offices are located next to the tennis courts, Julius Sprauve School and the Fire Station. In addition to offices, the semi-temporary structure houses the crafts area and a sewing room for homemaking activities.

The director of the agency in St. John felt that adequate facilities would eliminate many constraints, strengthening an already active program (23).

Recreational Programs. Organized recreation programs include those mainly related to school, church, and community youth programs. Little League Baseball, and an adult baseball team are fairly active (2). A volleyball group, not connected to any organization, meets on Sundays at Honeymoon Beach near Caneel Bay (2).

Existing public facilities include (13) (see Appendix D):

2 tennis courts - Cruz Bay

2 basketball courts - 1 Cruz Bay, 1 Coral Bay (near completion)

2 softball fields - 1 Cruz Bay, 1 Coral Bay (near completion

1 Little League baseball field - Cruz Bay

The new Coral Bay recreational complex nearing completion will include the above mentioned basketball and softball fields. In addition a restroom and shower facility is located adjacent to the facilities and covered bleacher seating for approximately 200-250 is located at the softball field and a smaller seating area at the lighted basketball facility (21).

Cruz Bay Park is in the process of being improved with the redesign and landscaping of the entire area. It provides a passive "seating" area with shade and benches for incoming and outgoing tourists as well as relaxing St. Johnians.

It is the general consensus of educators, youth program directors and the island administrator that a greater variety of facilities is needed. Specific needs cited include (21):

a gymnasium

swimming pool (training facility)

a track

passive recreational areas, picnic areas and shelters

Many passive recreational areas now exist on the National Park beaches along the north shore. However, other facilities mentioned above are not available on St. John.

Cultural Arts Programs. The availability of cultural arts programs on St. John is limited. In the past, performing groups such as choral, instrumental, and theatrical companies have been well received.

However, certain restraints have limited attendance, as well as deterred performing groups from visiting St. John. Two major problems have been identified as the lack of adequate performing and rehearsal areas and inadequate availability of short term housing (2) (see Appendix A).

In the past, areas which have been used for performances include the junior high school auditorium, Cruz Bay Park, and the Lutheran Church. Each of these areas are located in a three block radius within the community of Cruz Bay. While accessibility is not a problem, severe space limitations for both performers and audience, and excessive outside noise exist. In addition, rain limits the use of the park and often results in the cancellation of programs (2).

Since the programs have been dwindling, local residents have found it necessary to travel to St. Thomas to enjoy the cultural arts. In order for them to attend programs on St. Thomas, they must arrange a special ferry (the scheduled ferry stops running between the islands at 6 o'clock p.m.) to shuttle interested participants to and from St. Thomas in the evening (2).

The arts program is supported by two groups, the Virgin Islands Arts Council and a St. John arts organization. Funding to bring the performing arts to St. John is available, however, groups refuse to visit due to inadequate facilities and adverse performing conditions (2).

Housing for performers has been provided in the past by local residents and rooms in guest houses. Both of these sources are limited. However, if groups could be scheduled to perform, the local organizers feel that adequate housing could be arranged (2).

It is the hope of the arts council that an appropriate area be

developed for such activities. They strongly felt that if facilities were developed, an active arts program could be established (2).

Agricultural Programs. By being geographically isolated, St. Johnians have difficulty in obtaining fresh fruits and vegetables. Availability of areas with suitable soils for agricultural activities are limited. Consequently, residents are forced to pay premium prices for produce in poor condition as a result of shipping from the mainland (13).

It is felt that an area or areas should be designed for agricultural use in the form of small plots. If plots were available to local residents, fruit and vegetable production for both home and commercial consumption could take place. In addition, a youth training program could be initiated, familiarizing young people with agricultural and horticultural practices (13,22,23).

Summary of Community Needs

In order to accurately identify the specific nature and location of the proposed facilities, the "user groups" have been identified, and their particular needs documented. These needs have been listed in two general categories: educational needs and community (social) needs.

While both educational and community facilities are needed, a higher priority has been placed on community facilities. This is due to the fact that educational needs are now served, whereas, the lack of community facilities presents an immediate need.

In looking at overall needs, the most desired facilities (based on repetitive mention by user group representatives) include office space, work areas such as rooms for crafts, sewing, counseling, etc.,

agricultural plots, and an amphitheater or auditorium for performing arts. In addition, kitchen facilities for nutritional programs and meals on wheels have been identified.

National Park Service - Management Policies

In 1916, the Congress of the United States passed the Organic Act establishing the National Park System. According to this Act, it is the charge of the National Park Service to preserve and protect areas possessing outstanding natural and cultural resources of National importance.

National Park Service Policy

General management objectives are set forth in a General Management Plan (GMP). Virgin Islands National Park presently has no adopted GMP, however, management decisions are guided by a Statement for Management (16) specifically prepared for the park and the more general National Park Service Management Policy (Appendix C). The following presents portions of these policies which directly affect this project.

The Planning Process

Each area within the park is zoned. Each zone designation identifies the scope of use which will meet management objectives in order to achieve the purposes of the park. Development of park zones, must be consistent with capabilities of the land to support intended uses. Four zone designations are used: natural, historic, park development, and special use zones (see Appendix C).

Natural zones. These zones are managed to protect resources from alteration by human activity. Development is limited.

Historic zones. These areas are managed to protect and preserve cultural resources. Most often, they are those eligible for listing on the National Register of Historic Places. Development is limited to preservation and interpretive uses, however, some adaptive uses are allowed.

Development zones. In order to manage non-historic and intensive public use, limited areas of the park will be developed. Development will be limited to the smallest area necessary in order to accommodate required development and intensive uses.

Special Use zones. These zones include lands and waters used by others for purposes not permitted in natural, historical, or development zones. Examples include: reservoirs, non-Federal open space, areas supporting or proposed for mining, ranching, and lumbering.

Cooperative Regional Planning

Cooperative planning is needed to insure that regional and park planning coincides, avoiding potential conflicts. This action promotes the integration of future plans into the regional environment. The National Park Service supports joint planning efforts and promotes public participation in the planning process.

Park Facilities

> Only those facilities needed for management and appropriate public use and enjoyment shall be provided in a park area (see Appendix D).

The quality of all development within the park will be of high aesthetic and functional caliber.

Use of the Park

> The Service's mandate requires that it carefully plan and regulate the use of the parks so that park resources are perpetuated and maintained unimpaired for future generations (see Appendix D).

The use of land by the National Park System is resource based, not consumptive, therefore, limits and kinds of uses are set forth by requirements of resource management and protection. Interpretive presentations, environmental education and nontraditional uses fall under the requirements of management.

Activities and Facilities for Arts and Culture. The National Park Service does not support the establishment of facilities for the specific use of the performing arts. However, various cultural facilities and events do occur in the national parks. Cultural programs are permissible as long as they are consistent with each park's purpose and objective.

Interpretive Presentation and Environmental Education. Interpretive presentations including living history farms and interpretive demonstrations which enhance the understanding of park resources and enrich the experiences of the visitor are acceptable within the park. The dual mandate of the Park Service provides for the preservation of resources, as well as, for the enjoyment of the visitor. The Park Service plans and carries out such activities and programs enabling visitors to learn about the resources of the park. In addition, the

National Park Service encourages and aids environmental study program through the support of programs as:

- The National Environmental Education Development (NEED) Program
- The National Environmental Study Area (NESA) Program
- The National Environmental Living Program

The Service also provides technical assistance and information to others in development of study areas and programs.

Traditional and Non-Traditional Recreational Activities. The National Park Service encourages uses which draw their meaning from or have a direct relationship to park resources as long as those uses are consistent with the protection of such resources. Recreational uses which do not meet this criteria may be provided for in certain areas under careful supervision. Outdoor recreational activities which do not fall into the category of traditional uses or do not depend on park resources for their realization may be permitted when they do not:

- interfere with normal park usage
- constitute a consumptive form of use
- have an undesirable impact on park resources
- compromise the historic or natural scene or
- present a danger to the public welfare and safety, including safety of the participants.

These are the basic factors which govern uses within the park. The National Park Service will make final interpretations and final decisions on traditional and non-traditional uses in the park.

Summary - Social and Cultural Resources

Preliminary Program

Development of the preliminary program is dependent on a careful summary of the input from each interest group. This information is combined to form the preliminary program which will serve as a guide for the development of the community and cultural facility. In doing so, the role of each group must be identified in order to establish the nature and direction of their input.

The information provided by the Virgin Islands Planning Office and the National Park Service provides the established requirements of development. Their input directs the nature of the proposed facility and provides policy on land use rather than defining the type of facility. While both organizations are concerned with public needs (the Planning Office; local, and the Park Service; general), identification of actual needs is drawn from the community. Therefore, the involvement of these two groups is a direct result of expressed community need and their role is providing guidance for orderly development.

The Virgin Islands Planning Office has expressed a major concern relative to the need for thoughtful planning of future facilities. They feel that proposed facilities must be responsive to the social and physical structure of the community.

The National Park Service operating under the mandate of congress is charged with preserving and maintaining the natural and scenic resources for the enjoyment of future generations. Since the National Park Service operates within this mandate, any development on park lands must be consistent, allowing only those facilities which enhance the

interpretation of the parks resources. As outlined in the National Park Service - "Management Policy" (this chapter), these uses may include resource oriented educational programs, living history farms, and some forms of recreational use. However, it is unlikely that large scale development and heavy use areas such as swimming pools, game fields and schools would fall into this framework.

While these factors will guide management decisions, the major factors in establishing the program during the preliminary phase is expressed community need. In order to develop a more complete understanding of these needs and where possible priorities lie, the following matrices have been developed (see Figure 3).

USER GROUPS / PROPOSED FACILITIES	ACTIVE RECREATION	Swimming Pool	Track & Field	Tennis Courts	PASSIVE RECREATION	Auditorium	Gymnasium	PROGRAM FACILITIES	Offices	Cafeteria/Kitchen	Work areas/Classrooms	Agricultural Plots	TOTAL (Group needs)
COMMUNITY PROGRAMS													
Foundation for the Arts						X	X		X				3
Dept of Social Welfare						X	X		X	X	X	X	6
Community Action Agency						X	X		X	X	X	X	6
Public Recreation		X		X								X	3
EDUCATIONAL PROGRAMS													
Grades K-12		X	X			X	X		X	X	X	X	8
Vo-Tech Progam									X		X		2
Adult Education Program									X		X		2
TOTAL (Facilities needed)		2	1	1		4	4		6	3	5	4	

Figure 3

The first matrix, or summary, represents community needs as expressed by each community group interviewed. It indicates the facilities needed and the number of times it was indicated as a need. For example, six of the seven groups expressed a need for offices and five for work and classroom areas. The overlapping needs indicate the potential for developing a multi-purpose facility. However, in addition to expressed needs, the nature of each use, as well as, time of use must be studied to determine their compatibility.

User groups fall into two general categories; community and educational. With this in mind the following matrices were developed as a study guide to determine the compatibility in time of use (see Figures 4 and 5).

		ACTIVE RECREATION	Swimming Pool	Track & Field	Tennis Courts	PASSIVE RECREATION	Auditorium	Gymnasium	PROGRAM FACILITIES	Offices	Cafeteria / Kitchen	Work Areas / Classrooms	Agricultural Plots
COMMUNITY PROGRAMS	day												
	nite												
EDUCATIONAL PROGRAMS	day												
	nite												
(Time when joint use occurs) DAY	day	d					d	d		d	d	d	d
	nite						n	n					

Figure 4

		ACTIVE RECREATION	Swimming Pool	Track & Field	Tennis	PASSIVE RECREATION	Auditorium	Gymnasium	PROGRAM FACILITIES	Offices	Cafeteria / Kitchen	Work Areas / Classrooms	Agricultural Plots
COMMUNITY PROGRAMS	sum												
	win												
EDUCATIONAL PROGRAMS	sum												
	win												
(Time when joint use occurs) SEASON	sun									S			
	win	W	W				W	W		W	W	W	W

Figure 5

School uses tend to occur during the day and on weekends between the months of September and May, whereas, community uses vary greatly in time of day and season of use. This indicates community uses are more flexible in their scheduling, in most cases, than educational uses.

In developing the preliminary program each facility has been evaluated as follows:

Swimming Pool. The need for a swimming pool has been expressed by two groups. Community use of such a facility may occur both day and evening year round. In terms of educational needs, times of joint use would occur during the day between September and May. Since school age children generally make up the bulk of day users, a serious conflict is not foreseen. However, adults who wish to use the facility during the day while school is in session, would need to have a schedule prepared to set aside a time for pool use. If a pool is planned, it should be large enough to accommodate community use, as well as, educational use.

Based on current school enrollment a pool ranging in capacity from 200 to 600 users is recommended. The total size of this type of pool would range from 4,000 to 12,00 square feet in size.

Track and Field. Based on user group input, the need for a track and field facility was expressed by education. No other groups have pressing needs for this type of facility and use conflicts are not expected. Based on standard dimensions, a quarter mile track encircling a field would require approximately 4.7 acres of land.

Auditorium and Gymnasium. Both the community and education have expressed a severe shortage of gymnasium and auditorium facilities. In order to more economically satisfy both needs, a multi-use facility should be considered.

Based on use potential, it is recommended that an auditorium seating a minimum of 600 be furnished. If a gymnasium were constructed to satisfy the needs of 600 students the same structure would provide between 700 and 900 seating capacity when converted to an auditorium. With the addition of an approximately 2,500 square foot stage area, a gymnasium could successfully become a multi-use facility. The gymnasium locker room facilities could also serve as dressing rooms for the auditorium and as change rooms for the swimming pool. Total square footage of such a facility would range from 9,300 to 11,300 square feet for 600 to 800 students respectively.

Offices. The need for offices has been expressed by six user groups. While this appears as a likely area to combine facilities, potential use conflicts indicate that a variety of groups could not

easily share the same facility. However, offices could be housed separately in the same structure, depending on final location of the facilities. Total office space has been estimated between 1,200 and 1,400 square feet. Administrative needs of the school would require approximately 600 square feet while community offices would require approximately 600 to 800 square feet.

Cafeteria and Kitchen Facilities. School hot lunch, hot meals, and nutritional programs all indicated a need for kitchen facilities. Using the school lunch program as a basis for analysis, it appears that other programs such as the hot meals (meals on wheels) and nutritional programs could be coordinated with the school lunch program. For example, the hot meals prepared for the students could also be prepared for the hot meals program. Those involved in the community action nutrition programs could work with the school staff in preparing the meals. A sizable modern kitchen would be needed to provide adequate working facilities, as well as, storage and other support facilities. The cafeteria area would be a flexible area used for dining during the lunch hour and scheduled for other uses such as study hall or informal group meeting areas at other times of the day.

Facilities serving approximately 300 persons at one time would be required. Split lunch hour in either two or three shifts could be accommodated by this facility bringing the total number served during a one meal period to 900 if needed. Kitchen and cafeteria facilities combined, as described, would require approximately 4,500 square feet.

Classrooms and Work Areas. These rooms would include classrooms, as well as, rooms with multi-purpose uses. Uses would include

crafts, counseling, sewing and other related activities. While multi-purpose rooms could easily serve both community and educational needs, conflict in the time and nature of use would be difficult to resolve. Separation of these facilities is recommended in order to preserve an educational atmosphere, as well as, provide a relaxed atmosphere for recreational users. Based on an average figure of 20 users per room the community programs would require 5 to 10 rooms totaling 4,250 to 11,500 square feet, and the school would require approximately 20 rooms ranging from 17,000 to 23,000 square feet depending on the size and use of each room.

Agricultural Plots. The need for agricultural plots as other needs can be divided into the two basic groups of educational and community, or, those areas needed for study purposes and those needed for recreational gardening and production. Conflicts in time of use may occur during the school year if the facility were a joint endeavor, however heavier use is expected by the community. In this case scheduling could remedy any potential conflicts. Details presented by the user groups are not specific enough to design such an area. However, it is estimated that between one half to two acres of land would satisfy agricultural requirements for such crops as annual and perennial flowers, fruits and vegetables and some fruit trees. If demand warrants, additional areas for agricultural activities should be provided.

Summary of Spacial Requirements

The following is a list of areas representing the approximate spacial requirements for all facilities mentioned. A figure for parking

has been included. It represents the surface area needed to park between 300 to 400 cars. This number of cars would be primarily generated by use of the athletic facilities and/or the auditorium.

Building Requirements

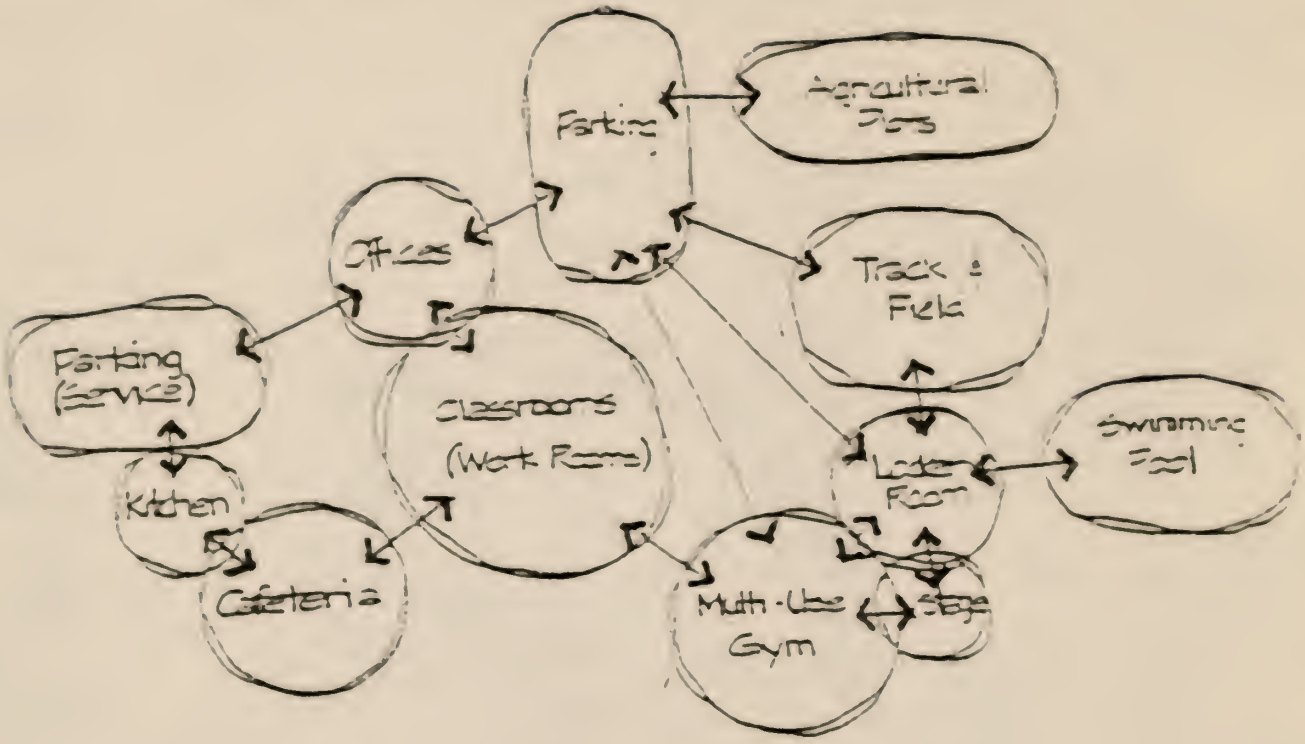
Multi-use Gymnasium	9,300-11,300 sq. ft.
Kitchen & Cafeteria	4,500- 4,500 sq. ft.
Classrooms	17,000-23,000 sq. ft.
Multi-use work rooms	4,250-11,500 sq. ft.
Offices	1,200- 1,400 sq. ft.
TOTAL	36,250-51,700 sq. ft.

Grounds Requirements

Parking	2.00-2.50 acres
Track and Field	5.00-5.00 acres
Pool	0.09-0.28 acres
Agricultural Plots	0.50-2.00 acres
TOTAL	7.59-9.78 acres

Based on the preceding figures a total combined area of building and grounds together would require a site ranging from nine to twelve acres.

While all uses may not be built on the same site, a diagram indicating the relationships between proposed uses has been developed in order to gain an understanding of how they will relate to each other.



Functional Relationships Between Uses

As site alternatives are studied, this model or analysis of program requirements will be used as a guide to insure proper use relationships.

2

THE INVENTORY

PART TWO

NATURAL RESOURCES

Geology and Hydrographics

Geology

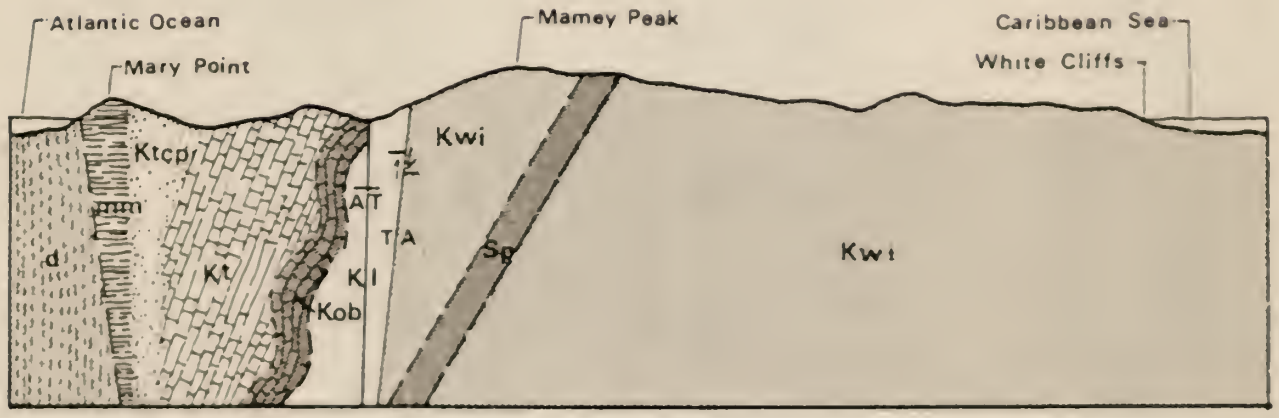
The origin of St. John is volcanic. The volcanic formations are situated in such a way that they dip steeply to the north forming a monocline (see Figure 6).

The oldest rocks, the Water Island Formation, are found along the southern slopes and are evident in rock outcroppings particularly along the shoreline. It is thought that these formations were formed during the initial stages of the island building process. They were deposited on the ocean floor by volcanic activity and are made up of underwater lava flows and related volcanic debris. These formations were affected by erosion, tilting and emergence or lifting. After this period of change a second formation (Louisehoj Formation of Donnelly, 1960) occurred. Unlike the submarine deposits of the Island Water Formations, Louisehoj rocks were a volcanic rock deposited on the flanks of a volcano. From the character of some of these deposits it is thought that the vent is located nearby in Pillsbury Sound. Erosion followed which leveled the volcano, and the land mass became submerged forming a shallow underwater plane (8).

Additional debris accumulated, forming the Outter Brass and the Tutu Formations of Donnelly (1960) which can be found in many of the younger formations in northern areas of St. John and in the British Islands (8).

After another period of lifting, folding and faulting the tilted rocks reached their present elevation. It is thought that during

GEOLOGIC CROSS SECTION OF ST. JOHN



EXPLANATION

d — Dioritic rocks

mm, Ktcp, Kt — Tutu Formation of Donnelly (1966)
Kt, volcanic wacks; mm, metamorphosed; K+cp, Coki Point megabreccia

Kob — Outter Brass Limestone of Donnelly (1966)
Siliceous ls.

Kl — Louisenhoj Formation, augite andesite, volcanic breccia and tuff, with minor conglomerates

Sp, Kwi — Water Island Formation, quartz keratophyre flows, flow breccia and tuffs, Radiolarites; Sp spillite flows

A T — High-angle fault. Horizontal movement shown by "A" relative movement away from observer, "T" towards observer. Arrow shows relative direction of vertical movement

Geologic contact

source (6)

Figure 6

EXPLANATION

—6— Contour showing depth below mean sea level, in thousands of feet

..... 100 fathom line = 600' depth

Closed depression

Depth less than 600'

BATHYMETRIC CHART

Figure 7

this period of crustal movement the Puerto Rican trench to the north and the Anegada trough to the south were formed (see Figure 7).

Summary

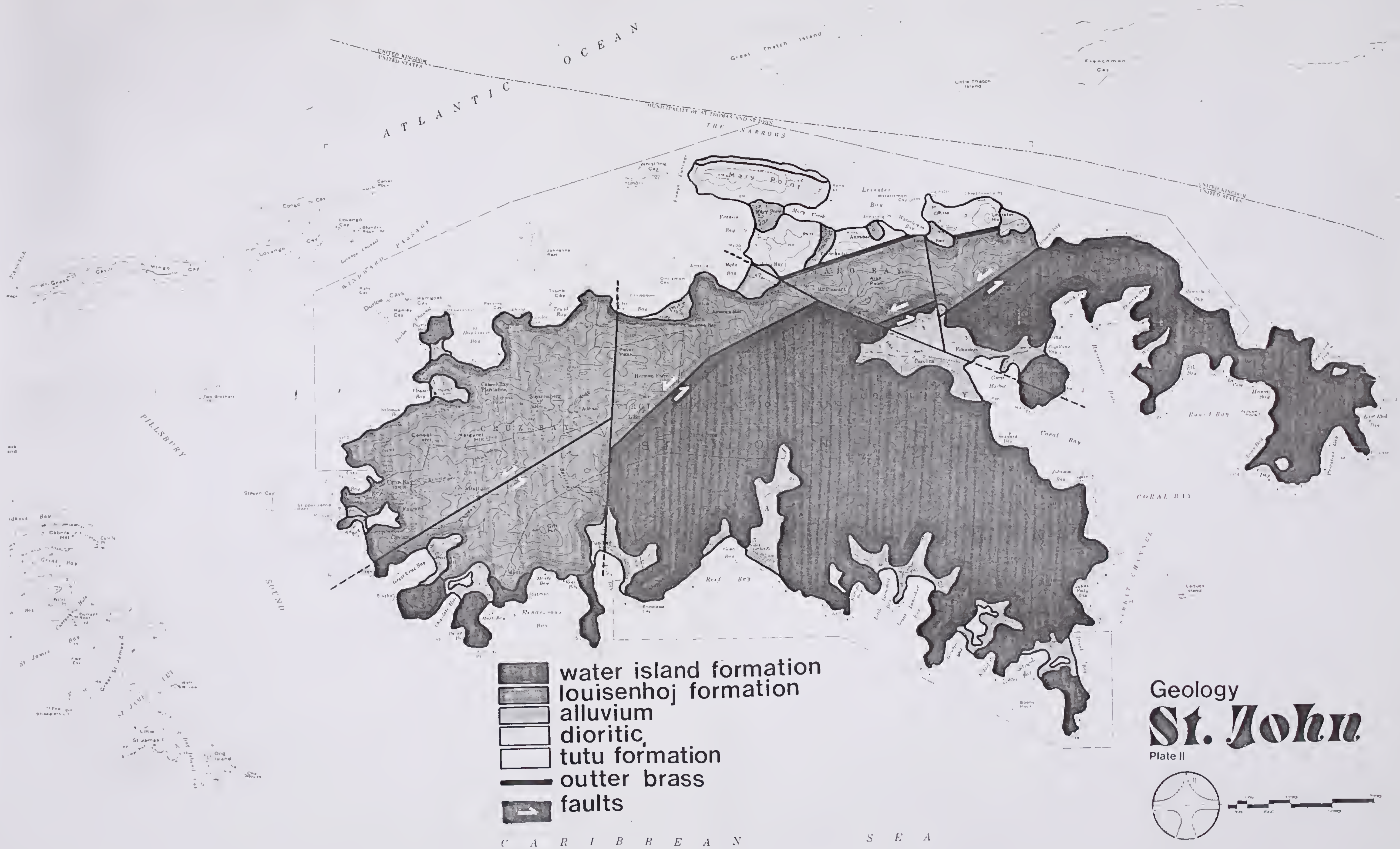
Geologic formations have a marked effect on the island's soil formation and water resources. There is a significant correlation between ground water, soils, and the geologic formation on St. John. Aspects of this situation are discussed in greater detail in their respective sections (see Plate II).

Hydrographics

St. John has always experienced a short supply of fresh water. Until the increase in tourism and population, enough water to serve the island has been available. With these recent demands on water resources, availability has become a major concern. According to a study by the Water Resources Division of the United States Geologic Survey in 1968 up to 1 to 3 million gallons per day are available in ground water reservoirs. These reservoirs are being tapped and will be discussed later in this section (6).

In order to better understand the overall context of how water moves on St. John it is important to study the natural influences such as climate, topo, and soils. The following is a brief summary of these influences.

Climate/Tides and Ocean Currents. Tidal changes in the Virgin Islands are minimal, ranging from one to two feet. This slight difference is due to two primary factors: 1) the enclosed nature of the region and 2) the close relationship of the islands to the equator (19).


ATLANTIC OCEAN
THE NARROWS
Mary Point
Coral Bay
CORAL BAY
Reef Bay
water island formation
louisenhoj formation
alluvium
dioritic,
tutu formation
outter brass
faults
CARIBBEAN SEA
Geology
St. John
Plate II

The Lesser Antilles are in the path of the North Equatorial Current which moves across the Atlantic Ocean from the northern coast of Africa. The combination of these currents swept in the same direction by the prevailing Trade Winds have more of an effect on the islands than do the tides. This combination of wind and current pushes the waters of the Atlantic against the Lesser Antilles and through the narrow straights and channels. These major east to west currents are then broken up into smaller currents and counter currents as they pass. Once the surface currents move through the Caribbean Sea, they flow west to the Yucatan Channel, then back to the east, before turning west merging with other currents to form the Gulf Stream (22).

As the east to west currents flow by St. John, they gain significant velocities of two to four knots (sometimes more) creating waves averaging one to three feet on the north shore and two to four feet on the more exposed south shore. The beaches on the north shore receive little significant surf (22).

The climate is physically comfortable during most of the seasons. Unlike weather systems affected directly by the heat loss and topographic features of large continental land masses, the Virgin Islands climate is subject to slightly different influences including: geographic location, small size of land mass, the generally elongated form of the islands, steep topography, and their location in an expansive body of warm water. These factors create certain types of precipitation, winds, cloud cover, humidity and evaporation, which collectively produce the climate (22).

Very little fluctuation in temperature occurs between the coldest month of February (mean high of 76 1/2°F) and the warmest month of

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S E A

FOLDOUT
HERE

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Very little fluctuation in temperature occurs between the coldest month of February (mean high of 76 1/2°F) and the warmest month of

August (mean high of 81°F) - only a 5° difference. Normal daily fluctuation (mean daily maximum and minimum) in Cruz Bay on St. John being 70-83°F in February, 76-89°F in August. These temperatures are comparable to Miami, Florida whose maximum and minimum temperature is 8-9°F cooler during the winter (22).

The most noticeable seasonal aspect of the Virgin Islands is the wet and dry seasons. The average annual rainfall at Cruz Bay (on the sheltered west side) is 41.9 inches a year, with September being the wettest month (5.9 inches) and March the dryest (1.6 inches) (22).

Average annual relative humidity of the islands is near 80%. It ranges from an afternoon low of 60% in March to 90% on an October night (corresponding to rainfall). Two factors diminish the potentially uncomfortable effect of high humidity in combination with high temperatures; the trade winds which provide comforting air circulation especially during the afternoons when temperatures are highest, and the times of higher humidity occur when temperatures are lowest and vice versa (22).

Tropical storms do not occur with any frequency in the Virgin Islands. However, hurricanes originating in the Atlantic pose the greatest threat and have caused extensive damage in the past. Records show that about a dozen destructive storms occurred during Danish occupation. Storm frequency is one every 23 years with two occurring in this century - the last in 1932 (22).

Topo and Drainage. St. John possesses a main ridge extending from east to west with steep slopes extending to the sea on the north. South of the main spine several prominent spur ridges exist. The

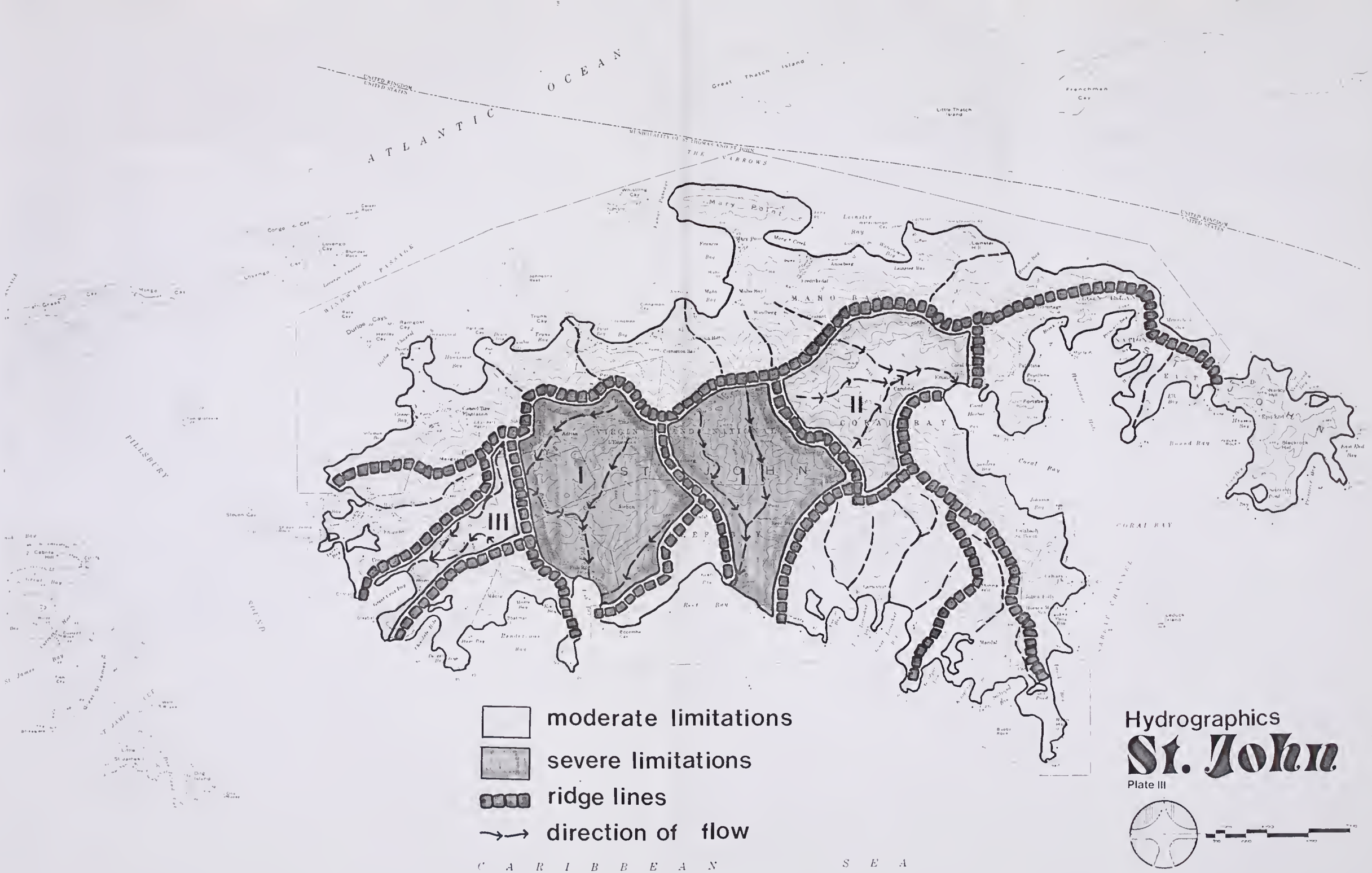
highest point on the island is Bordeaux Mountain (elevation 1,277 feet above sea level) and it forms one of the spurs. Another spur is formed between the main ridge and Camelberg Peak (1,193 feet). Mamey Point (1,147 feet), the third highest point, is located directly on the main ridge. East End is a long irregular peninsula which extends 3 miles south and east of the main ridge (6).

Major drainage basins are located on the south side of St. John and include: Reef Bay Gut with an area of 1.77 square miles, Fish Bay Gut with 1.77 square miles, Coral Bay Gut with 1.69 square miles and Guinea Gut with 0.72 square miles (6) (see Plate III).

"Hydrologic Cycle". The hydrologic cycle is clearly observable on St. John due to its small self-contained environment. The cycle is repetitive with three storage areas: the land, the sea, and the atmosphere. The energy behind the cycle is provided by gravity and the sun, solar being the major force. The process and storage characteristics of the area directly affects the availability of water (see Figure 8).

Forms of water which directly relate to the cycle are rainfall, soil moisture, evapotranspiration, stream-flow, and ground water.

Rainfall is the only natural source of all fresh water on St. John. Average islandwide rainfall on St. John is 44 inches per year (6). Showers of short duration provide a few hundredths to a few tenths of moisture. Rainfalls of one to two inches can be expected about six times yearly, showers of three inches three times a year, and showers yielding over three inches may occur only once a year. Catchments on rooftops provide the bulk of domestic water supply under normal rainfall conditions. Supplemental water is brought to St. John by



moderate limitations

severe limitations

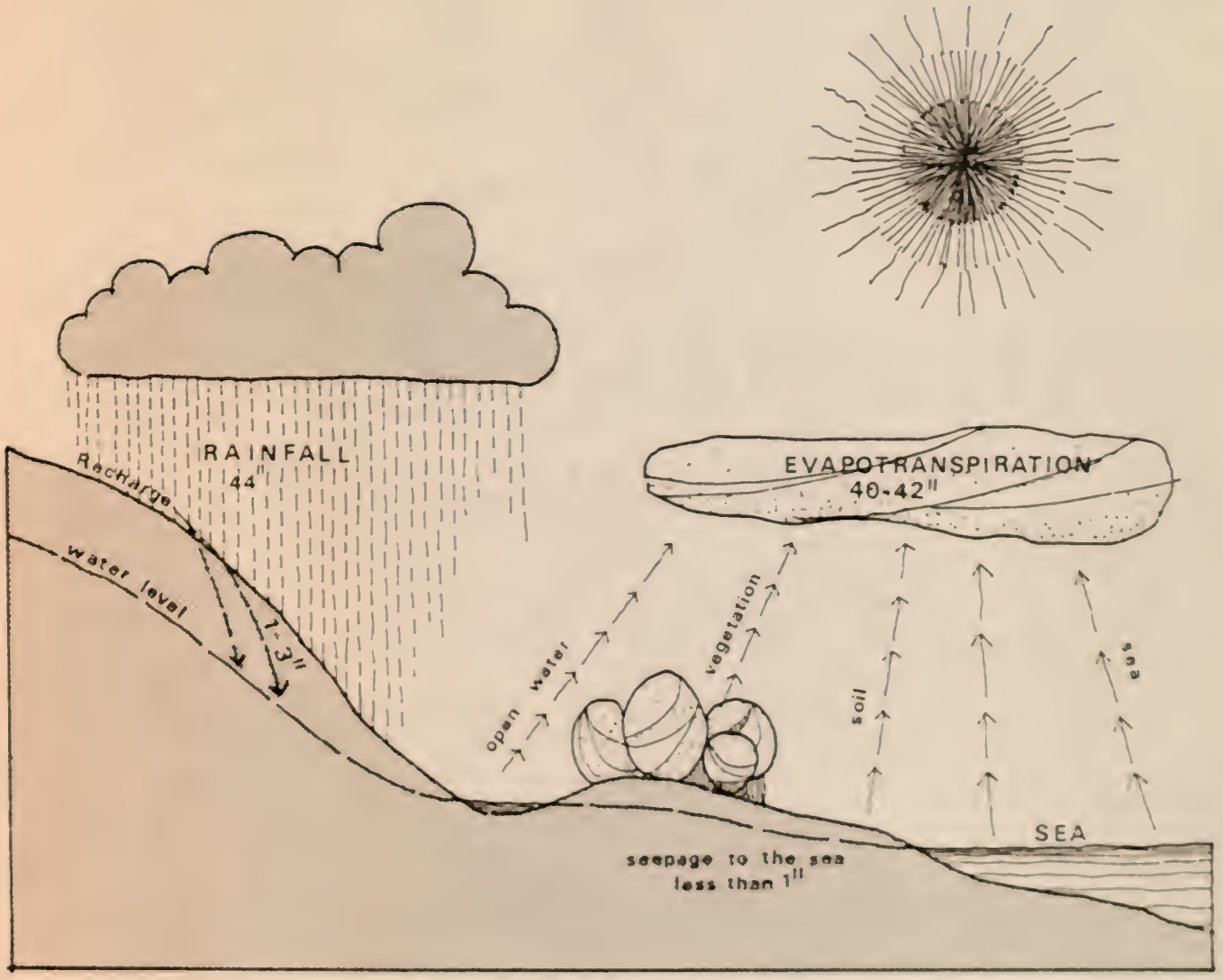
ridge lines

direction of flow

Hydrographics

St. John

Plate III



THE HYDROLOLOGIC CYCLE

Figure 8

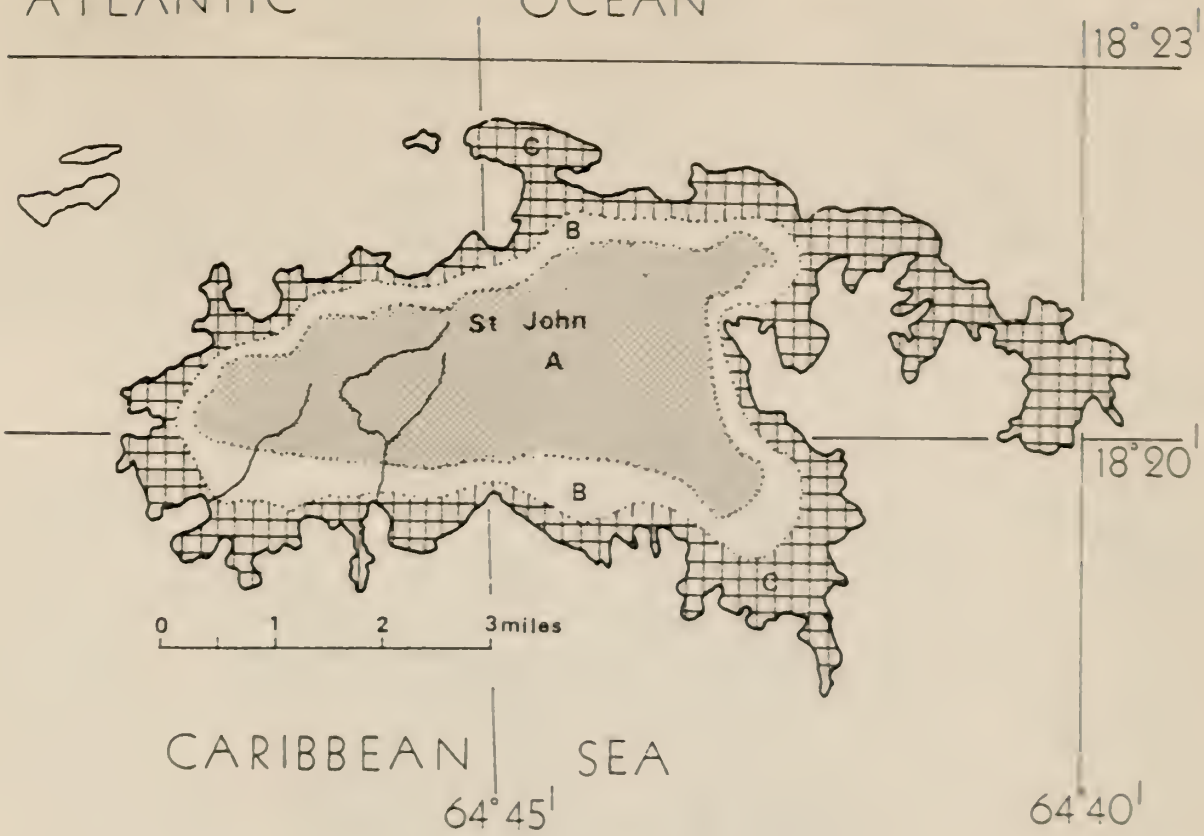
tanker from St. Thomas or Puerto Rico during drought periods. All homes are required to have catchments and cisterns for water storage. These systems generally yield 50 gpd (gallons per day) for every 1,000 square feet of catchment area (17).

Evapotranspiration is an important factor influencing water resources on St. John. It is active during all seasons accounting for loss of 90-95% of the total annual rainfall. Transpiration returns moisture to the atmosphere mostly through plants at the average rate of 100 gal. daily for an average sized tree (7).

Two to four inches of the annual rainfall are left after transpiration and evaporation for the fresh-water supply in the form of ground-water. Less than one inch enters the sea as streamflow, with the exception being streamflow resulting from severe storms (6).

A remaining one to three inches of the annual rainfall enters the soil and stream channel deposits and percolates downward through loose subsurface material and openings in the rock to the water table. General movement of this water is seaward. At points the water table is as much as 100 feet below land surface but generally is less than 50 feet. By the sea it's only slightly above sea level (see Figure 9). Aside from rainwater, ground-water makes up the second major source of fresh and brackish water on St. John.

All water has some mineral content. As water evaporates into the atmosphere it condenses around small dust and chemical particles producing raindrops. In this area a great quantity of salt particles suspended in the atmosphere. These salt particles accumulate on land masses. As rain falls, it absorbs salt particles, creating a "washing" effect. Vegetation and other land surfaces also benefit from this



Area A.--Island interior, generally above 200 ft altitude. Drilled wells 100 to 300 ft in depth, bottomed not less than 50 ft below the water table and above sea level, will produce from 500 to 5,000 gpd of water having up to 1,000 mg/l dissolved solids. In the most favorable valleys, such as at Reef Bay and Coral Bay, a few wells may produce up to 10,000 gpd. Locally, where the water table is less than 20 ft below land surface, dug wells will produce up to 500 gpd. (A few drilled wells will be dry or will produce poor-quality water.)

Area B.--Island perimeter, generally at least 50 ft above sea level and up to 200 ft above sea level. Drilled wells 50 to 200 ft in depth, bottomed not less than 20 ft below the water table and generally above sea level but in some cases can be as much as 50 ft below sea level, will produce 500 to 2,500 gpd of water having 1,000 to 2,000 mg/l dissolved solids. Locally, where the water table is shallow, dug wells will produce up to 500 gpd. Pumpage must be controlled to avoid sea-water encroachment.

Area C.--Island perimeter, generally less than 50 ft above sea level, but includes high ground on peninsula. Drilled wells generally will be subject to sea-water encroachment, and water contains more than 2,000 mg/l dissolved solids. Water generally suitable for sanitary purposes only. Locally, dug wells will produce small quantities of better quality water.

source: (6)

GROUND WATER IN FRACTURED VOLCANIC ROCK

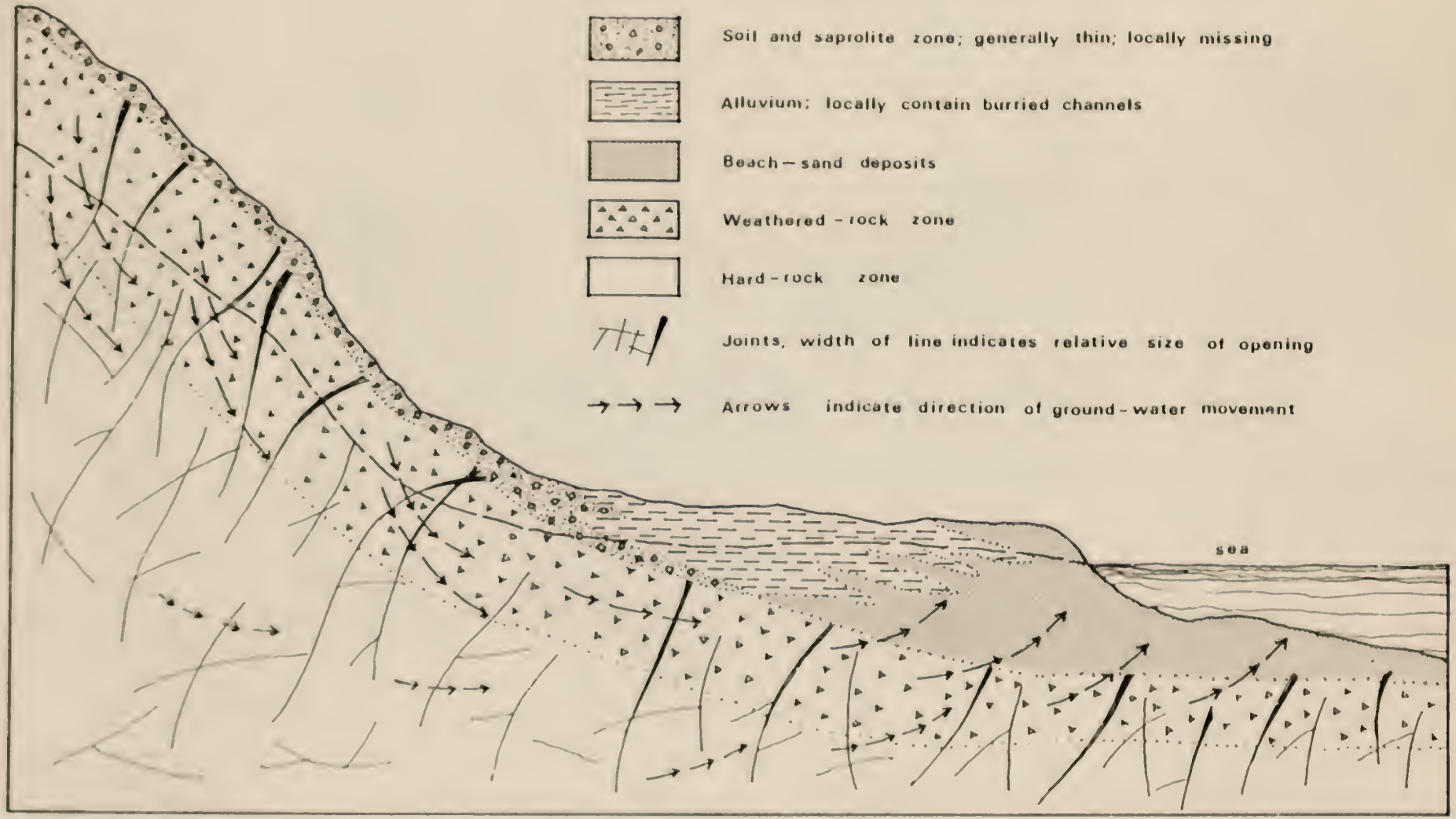
Figure 9

washing effect. Heavy rainfalls which pass quickly over and through soils have a marked leaching effect returning minerals to the ground-water and the sea (6).

Ground-Water Sources. Three types of aquifers can be found on St. John and include: beach sand, alluvial filled valleys, and fractured volcanic rock formations. These aquifers coincide closely with the geologic structure of the island. The following explains the water availability in each of these aquifers.

Water in Fractured Volcanic Rock. The fractured volcanic rock formations are the most significant sources of ground-water on St. John. These formations include lava flows, water laid tuffs, breccia's, flow breccia's and interbedded limestone. Angular volcanic rubble became tuff and breccia, which had much pore space originally than exists now. Now the abundance of open spaces are located along joints and openings caused by weathering. The fractured volcanic rock formation can be broken down into three geohydrological zones: soil, weathered but recognizable rock, and unweathered rock. Figure 10 shows a section of volcanic rock aquifer and its relation to hydrologic units.

Soil. Soil is the first zone to receive rainfall. If this layer is thick and permeable it will assist recharge of the ground-water reservoir. If it has low permeability the storage capacity will be low and runoff will enter streams. Soil on steeper slopes is generally thin but has high permeability, whereas valleys possess thicker less permeable soils. A secondary soil layer or saporlite zone generally not found on St. John. Soil mostly lies over the weathered rock zone (6,8, 15).



GEOHYDROLOGIC ROCK UNITS AND GROUND-WATER MOVEMENT

source: (6)

Figure 10

Weathered Rock Zones. These zones range in thickness from a few feet to 50 feet. The particular importance of this zone is the subsequent solutioning of these rocks as water passes through them. This process tends to open joints and promote ground-water movement (6).

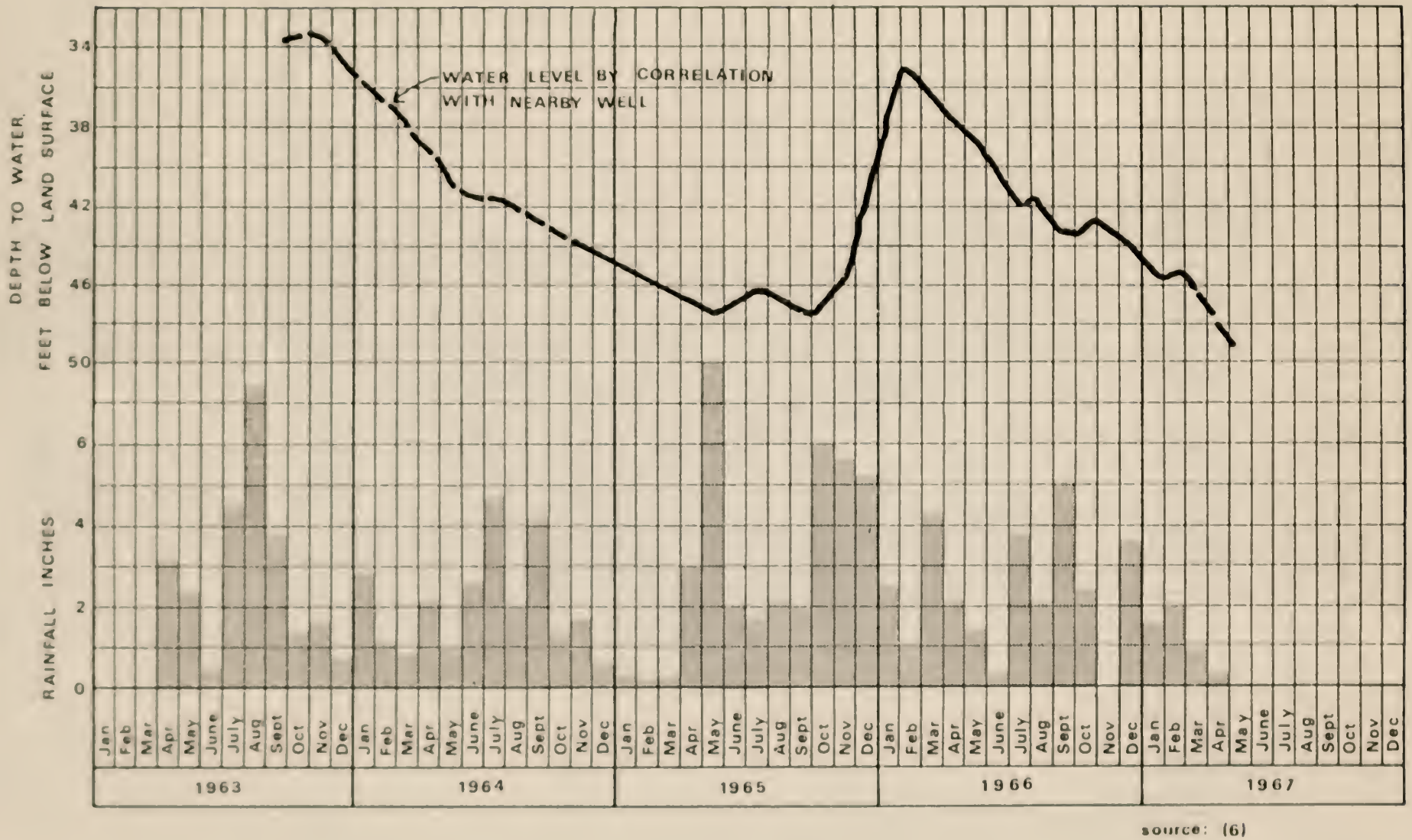
Unweathered Rock or Hard Rock Zone. This zone contains water along joints which occur more numerously at the surface (6).

Major drainage basins formed along fault zones and minor basins along lesser faults and joints. These faults or joints act as conduits for ground-water movement from the head to the mouth of valleys (6,15).

Recharge to ground-water reservoirs moves through the soil into fractured rock zone and downward into the water table. During periods of heavy rainfall there is more runoff into the less permeable soils in stream beds. As it gradually seeps downward water enters into the gravel beneath the stream bed soils into the water table. Recharge through stream beds is most frequent but the total recharge through the soil is probably greater due to the fact that the greatest quantities of recharge to ground-water reservoirs takes place after heavy rains that saturate soils (6).

Soil moisture conditions at the time of a rainfall directly affect the amount of moisture received by the soil and conveyed to the water table. If soils are moist prior to rainfall their ability to allow water to pass into and through them is greater (6,15).

During the charted period (see Figure 11) St. John had a severe drought. Ground-water levels in May 1965 indicate the lowest readings in many years. Small rises indicate that most of the rainfall did in fact replenish soil moisture. Lesser rains later in 1965 had a greater



source: (6)

HYDROGRAPH OF WELL USGS-16 AND RAINFALL AT BETHANY CHURCH

Figure 11

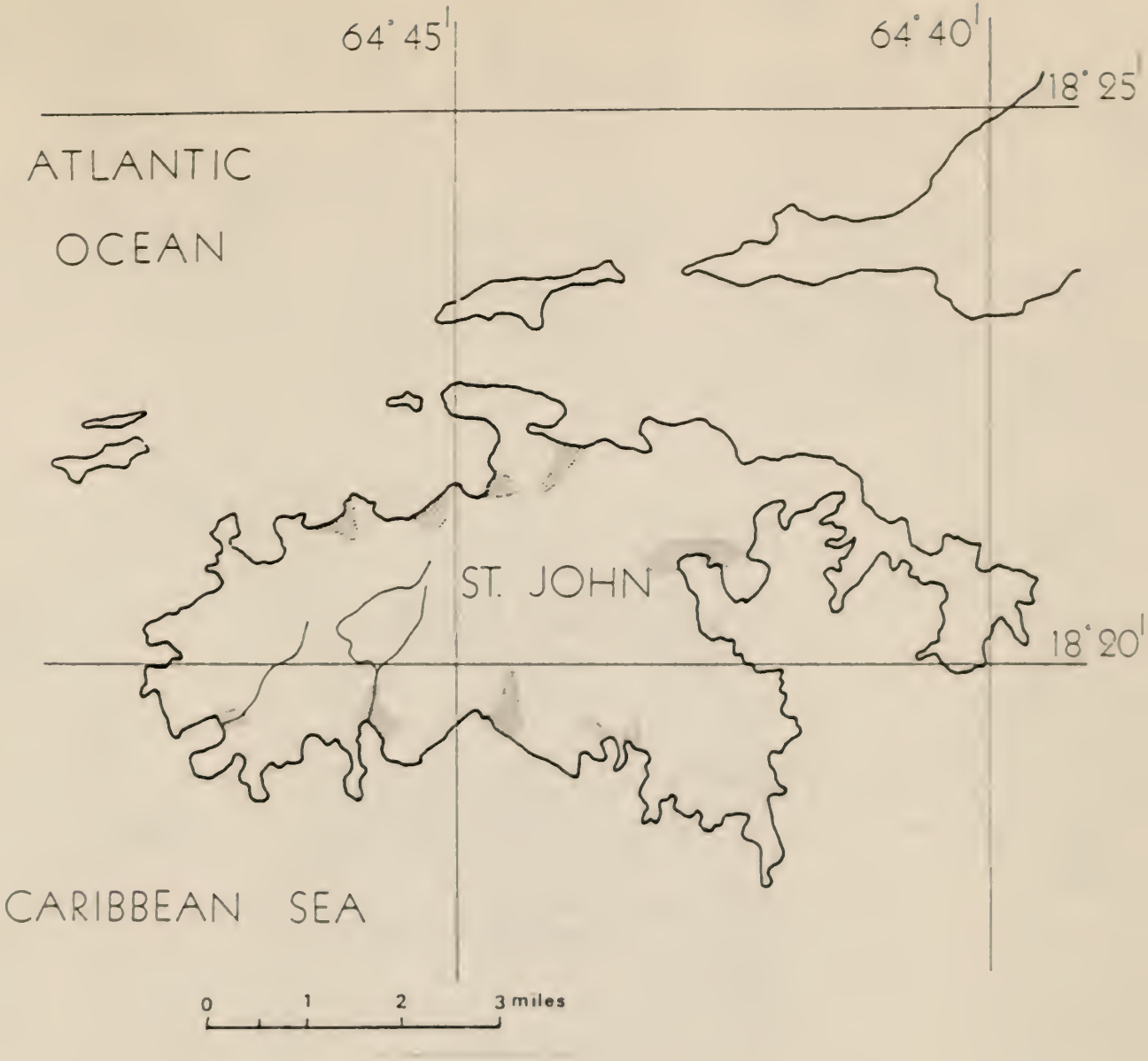
effect on the water table due to the moist soil conditions caused by earlier rains (6).

Water in Alluvial Deposits. Alluvial deposits on St. John are small, generally located at valley mouths and are made up of sediment over gravel (see Figure 12). Upper stream channels tend to be steep, very narrow, cutting into bedrock. One to three foot boulders over gravel are common. Between the altitudes of 60 to 160 feet a break in grade is common. At this point the channel begins to level out, widen, and thicken. This trend continues as it progresses downstream.

Data on the alluvial water table is vague. It is located near sea level at the mouth and extends upward at a lesser grade than the land surface. Recharge takes place through the stream channels, the fractured rock aquifer, and the flood plane which exists as a result of heavy runoff from previous severe storms.

Quality of the water found in these areas varies and is greatly affected by the occasional encroachment and mixing of seawater. This can occur if fresh water is removed at a faster rate than recharged, drawing brackish or salt water into the area (6).

Water in Beach Sand. The configuration of beach sand in relationship to alluvial deposits and fractured volcanic formations is shown in Figure 13. The sand is almost entirely made up of shell and coral fragments ranging from very fine to very coarse. The water table is subject to rapid change due to high surf, tides, and rainfall. It is situated one foot above sea level and may reach three to four feet after a heavy rainfall (6).

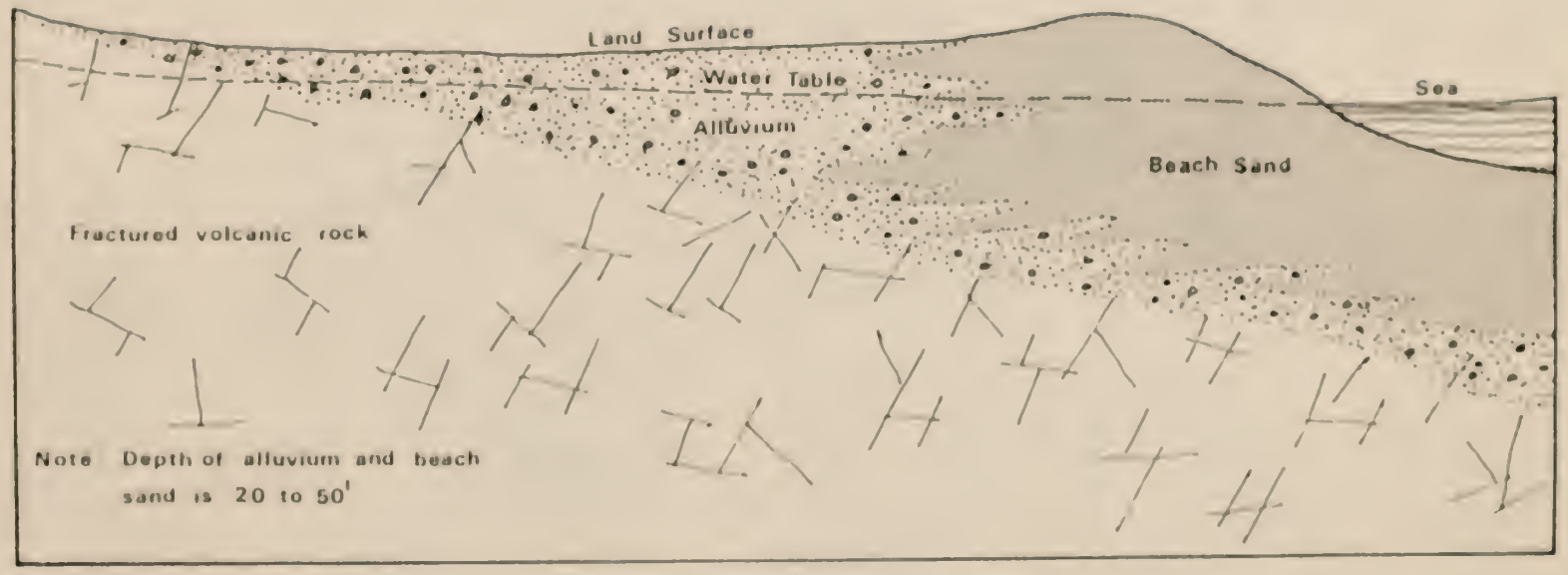


Dug wells will yield 500 to 2,000 gpd of good-quality water away from the sea. Drilled wells that penetrate alluvium or beach sands to depths greater than 5 to 10 ft below water table will yield up to 2,000 gpd. Quality will be variable in the beach sands and adjacent alluvium. Wells that bottom at or below sea level are subject to seawater mixing and, if overpumped, to seawater encroachment.

source (6)

ALLUVIAL AND BEACH-SAND THAT CONTAIN GROUND WATER

Figure 12



SECTION OF TYPICAL VALLEY AND BEACH AREA

Figure 13

A very thin layer of fresh water ranging from a few inches to a few feet thick overlays a layer of brackish water which is above sea water. Pumping of water too quickly causes the same effect as in alluvial areas: encroachment of brackish and/or sea water (6).

Summary

Until new water sources are available to St. John, primarily desalinization facilities, current water resources must be carefully used, managed and protected. Six wells have been recently established on St. John. Their ability to produce water at the rate of 130,760 gallons per day (7) is significant. However, amounts of rainfall will have the ultimate effect on productivity. This factor is virtually unpredictable. In order to maintain pure water quality, the watershed which supplies the aquifer must remain unpolluted. To achieve this, the major watersheds along the south shore must be protected from undesirable surface uses including; the introduction of nutrients from farming, septic field waste disposal, and excessive runoff from surfaced areas, such as, parking lots. In addition, removal of large quantities of water from the wells located along Centerline Road may endanger the existing plant life by decreasing the amount of available water. Evidence of this has been noted by residents in the Cinnamon Bay area.

Major watersheds have been identified and ranked in size as follows: 1) Reef Bay Gut and Fish Bay Gut (both equals), 2) Coral Bay area and 3) Guinea Gut. Plate III indicates the location, approximate ridge boundaries and the direction of surface drainage. While the landfill and increasing residential development exists in the Guinea Gut

watershed, any future development in the remaining three should be carefully analyzed and protective measures employed.

Soils

The Virgin Islands has seven basic soil associations. Only one major association, Cramer-Isaac, is found on St. John. This association is generally characterized by very steep to strongly sloping lands which are well drained, clayey in subsoil and shallow to moderately deep over volcanic rock. They can be found on mountain sides and foot slopes ranging from a 50 to 70% slope. The soil tends to be reddish in color with rock outcrops and boulders mixed with stone and gravel in the surface layer (15) (see Figure 14).

Soil associations having similar profiles except for differences in surface textures are grouped together into soils series. Each series is further divided into soil types and subtypes.

Cramer Soils Series. There are six soil types in the Cramer Series, all found on St. John. These soils are typically characterized by steep to very steep slopes. They are generally shallow red or reddish brown soils formed over partly weathered volcanic rocks. Cramer soils are well drained and moderately permeable with a gravelly and stoney surface layer (15,20).

Isaac Soils Series. The Isaac series is made up of three types, two occur on St. John. Isaac soils compose much less of St. John's soils than the Cramer Series. They are generally found on strongly sloping foot slopes and are moderately deep and well drained. These soils, as those in the Cramer Series, were formed in place over

SOIL SUITABILITY SUMMARY

Symbol	Soil Type / Soil Name	Locations on St. John	Per cent Slope	Agri. Suitability See Note	Engineering Properties: Foundations Dwellings	Engineering Properties: Roadbeds	Engineering Properties: Septic Systems	Recreational Suitability	General Comments
CrC		Anneberg, Caneel	5-12	VI	severe	severe	severe	severe	
CrE	Cramer Gravelly Clay Loam	Slopes	12-40	VI	severe	severe	severe	severe	
CrF		Slopes	40-60	VII	severe	severe	severe	severe	
CsE ?		Slopes S.W. St. John	12-40	VII	severe	severe	severe	severe	Soils generally shallow - bedrock at 10-20"
CsF	Cramer Stony Clay Loam	Guts	40-60	VII	severe	severe	severe	severe	
CtE	Cramer Isaac Gravelly Clay Loam	Bordeaux, Adrian	12-40	VI	severe	severe	severe	severe	
IsD *	Isaac Clay Loam - Saprolitic	West St. John	12-20	VI	mod.	mod. sev.	severe	mod.	Bedrock at 20-72"
IsE	Substrate	Gift Hill	20-40	VI	severe	mod. sev.	severe	severe	
AgE	Aguilita Gravelly Clay Loam	Mamey Peak	20-40	VII	severe	mod.	severe	severe	Erodable if exposed
Cb	Cobbly Alluvium	Lameshur		VI	severe	mod.	severe	severe	Stones hinder use
DcE	Descalabrado Clay Loam	Mary Point	20-40	VI	severe	severe	severe	mod.	Shallow soils over bedrock
GyB	Glynn Clay Loam	Bays E. St. John	2-5	II	slight	mod.	mod.	mod.	High shrink - swell
JaC	Jacana Clay Loam	Mary Point	5-12	IV	severe	severe	severe	mod.	Bedrock at 20-36"
JaB	Jaucas Sand	Beaches	0-5	VII	severe	mod.	severe	severe	Subject to flooding
PbC	Pozo Blanco Clay Loam	NE St. John	5-12	IV	severe	mod. sev	mod.	mod	Highly erodable
SaA		Valley Bottoms	0-3	II	mod.	mod. sev	mod. sev	mod. sev.	
SaC	San Anton Clay Loam	Fredriksdal, Coral Bay	5-12	III	slight	mod. sev	mod. sev	mod.	Subject to flooding
SmE	Southgate - Rock Land Complex	East End	20-60	VII	severe	severe	severe	severe	Bedrock at 10-20" erodable
Ts	Tidal Swamps	Bays	--	VIII	severe	severe	severe	v. severe	High water table - flooding
Tf	Tidal Flats	Bays	--	VIII	severe	severe	severe	v. severe	High water table - flooding
Vr	Volcanic Rock	Headlands	--	VIII	severe	severe	severe	severe	Bedrock at surface
Sp	Salt Ponds	Bays	--	--	severe	severe	severe	v. severe	

* Source: USDA - Soils Survey USVI

Figure 14

weathered volcanic rock and contain many angular volcanic rock fragments on the surface (15).

Minor soils associated with the Cramer-Isaac Association include:

. San Anton . Glynn	found on narrow alluvial fans and flood plains below Cramer and Isaac soils
. Aguilita	located on low hills and foot slopes
. Cobbly Alluvial Land	found on narrow flood plains

The Cramer-Isaac Association has severe limitations, mainly shallowness over rock and steep slopes. They are unsuitable for cultivation and most agricultural uses and have severe engineering limitations for development. These soils are generally best suited for limited recreational uses and wildlife habitats (15).

The following capability classes are designated by the Soil Conservation Service, United States Department of Agriculture, and describe agricultural suitability of soils on St. John (see Figure 13). Soils are classified by Roman numerals I through VIII and indicate the degree of limitations for use as the number increases. They are as follows (15) (see Plate IV):

Class I. Class one has few limitations that restrict their use. No class one soils exist on St. John or any of the United States Virgin Islands.

Class II. These soils have moderate limitations which reduce choice of plants or that require moderate conservation practices. Class II makes up only 4.9% of the total soils on St. John and can be found generally in valley bottoms.

ATLANTIC OCEAN

UNITED KINGDOM
UNITED STATES

THE NARROWS

UNITED KINGDOM
UNITED STATES

CORAL BAY

CARIBBEAN SEA

soil classification

- II
- III
- IV
- VI
- VII
- VIII

Soils

St. John

Plate IV

Class III. Class III soils have severe limitations restricting the choice of plants and/or require special conservation practices. Only .6% of all soils on St. John fall into this class.

Class IV. These soils have very severe limitations which restrict plant selection and/or require very careful management. 1.2% of St. John is made up of Class IV soils.

Class V. These soils are not likely to erode but have other limitations restricting their use largely to pasture or range, woodland, or wildlife habitat. There are no class five soils on St. John.

Class VI. Class VI soils have severe limitations making them generally unsuitable for cultivation. Their use is limited to pasture or range, woodland or wildlife habitat. Soils in this class make up 39.8% of St. John.

Class VII. Class VII soils have very severe limitations making them generally unsuitable for cultivation and limit their use largely to pasture or range, woodland or wildlife habitat. Soils in Class VII make up 48.7% of St. John.

Class VIII. These soils and landforms have limitations which preclude their use for commercial plant production and restrict their use to recreation, wildlife habitat, water supply, or aesthetic purposes. 5%

of St. John is made up of Class VIII characteristics.

Summary

Generally, all soils on St. John have severe use limitations with regard to development including; foundations, roadbeds, septic systems, as well as, recreational and agricultural use. However, development with care is possible but costly on most soils. Since the majority of soils on St. John pose severe limitations development should be carefully located.

Vegetation

Clearing and cultivation practices during early European occupation of the 17th and 18th centuries, destroyed original vegetation, which was thought to have been tropical rain forest (24). Vegetation was almost completely stripped from St. John and replaced with sugar cane. After the emancipation of the Caribbean slaves (much earlier than in the U.S.) grazing and homesteading was established allowing the forest to slowly reestablish (14,24). Consequently, little information is available describing the character of the original vegetation (24).

Today specific classification of plant material is difficult due to current land use practices and the extremes in existing microclimates (24). Land patterns, rainfall, wind, slope orientation, and soils are the best indicators available in understanding today's plant communities. Of these factors, wind is the single major influence, having a profound effect on rainfall, soil moisture, and distribution of plant materials (24).

moist forest

dry forest

dry forest with cactus & agave

croton-acacia

cactus woodland & wind flattened scrub

Vegetation
St. John
Plate V

In order to map vegetation, general families have been established and are referred to as "groups". These groups reflect plant communities which grow in similar situations (see Plate V).

Moist Forest

The "Moist Forest Group: is largely characterized by an evergreen hardwood forest located mainly in protected areas along the north shore and in the interior highlands. These areas have high rainfall and rich soils (see Figure 15). Higher moisture conditions and deeper soils located in guts provide the most prolific growing conditions (see Figure 15). Vegetation which more closely resembles the tropical rain forest can be found only in these isolated areas. Basic plant communities for the "Moist Forest Group" have been outlined by Zube (24) and contain such plants as: Bay Rum, Trumpet Tree, Cabbage angelin, and Maneyuelo (11,24).

Dry Forest

The "Dry Forest Group" includes an extensive range of plant materials, climatic situations, and ecological changes. For this reason it has been broken into the sub-groups which more accurately reflect existing micro-climates and include; dry forest, dry forest with cactus and agave, croton acacia, and cactus woodland-wind flattened scrub. Moisture requirements for this sub-group are greatest for the dry forest and diminish respectively (see Figure 16).

Dry Forest. Location of this sub-group coincides with the less protected and varied ridge crests, as well as, the less exposed and

CHARACTERISTIC MOIST FOREST VEGETATION

Figure 15

CHARACTERISTIC DRY FOREST VEGETATION

Figure 16

lower interior south and east slopes. Plants in this sub-group require a greater degree of moisture than any others in this group. Plants typically found in this classification include: Stink Casha, Common Calabash tree, Pricklypear, Frangipani, and Box Briar (19,22,24).

Dry Forest with Cactus and Agave. This sub-group consists mainly of those plants in the dry forest sub-group and are found in similar areas. However, these areas receive less rainfall resulting in more prolific growth of cactus and agave (19,22,24) (see Figure 17).

Croton-Acacia Scrub. Croton-acacia scrub is secondary vegetation typically reestablishing after clearing and overgrazing. Plants included in this group are dense growing small trees and shrubs which are difficult or impossible to penetrate on foot. They include; Wild Tamarind, Catch and Keep, White Maran, and Box Briar (19,22,24).

Cactus Woodland and Wind Flattened Scrub. Cactus woodland is located primarily on low east and south facing slopes and wind flattened scrub on low east facing exposed slopes. Agave and cactus are prevalent with some small trees which are greatly altered in size and form by constant exposure to winds and less fertile soils (19,22,24) (see Figure 18).

Mangrove. Mangroves are found in restricted areas of St. John. Characteristically, they are located in areas where guts empty into bays and in the shell and coral debris which dam the flow of water towards the sea. This produces a swamp-like condition with brackish waters (19,22,24).

CHARACTERISTIC DRY FOREST WITH CACTUS

Figure 17

CHARACTERISTIC WIND FLATTENED SCRUB

Figure 18

Beach Vegetation. A linear forest is located along the edge of the beach. The location of this linear forest is generally defined as the area between storm tide (highest tide) and the point where sand (coral and rock granules) end. This distinct hedge is narrow as compared to other vegetation zones. Located at low elevations along the island's seaward edge, beach vegetation grows taller toward the landward edge holding the highly errodable beach in tact. Vegetation is generally dense, gnarled and capable of withstanding the adverse conditions posed by wind, waves, and salt spray and includes Seagrape and many palm species (19,22,24) (see Figure 19).

Summary

It has been established that at one time St. John had been almost entirely denuded of native vegetation for agricultural purposes and has since reestablished. While this type of severe alteration is not likely to occur again, much care should be taken in clearing areas for any type of use to avoid negative impacts. Soils tend to be thin and permeable. Loss of vegetation dramatically increases runoff and siltation. Since St. John is an island environment, silt flows towards the sea and is eventually deposited in bays. This results in severe damage to delicate coral reefs and a needless loss of precious top soil (19,20, 22). With such a broad range of vegetation types and lack of specific data on location of each, a detailed inventory should be executed prior to locating any use or structures.

CHARACTERISTIC BEACH VEGETATION

Figure 19

Slope

St. John is made up primarily of steeply sloping terrain. Plate VI, relief, indicates the elevational changes of St. John and where the highest and lowest points occur. Thicker bands of color represent flatter slopes, thinner bands, steeper slopes. While the sharp contrast between the steeply sloping hillsides and the flat surface of the ocean provides a pleasing visual contrast, it poses many difficult problems for development on St. John. In order to more closely study these limitations, a slope analysis has been prepared (see Plate VII). The slope analysis indicates ranges of slope percentages and their suitability for development as follows:

0-10% Slopes. These gently sloping areas generally occur in low alluvial areas and along ridge tops. Alluvial areas are small in area as compared to other more steeply sloping areas, however, they provide acceptable slopes for development with a minimum of impacts. Areas along ridge tops tend to be narrow and linear in form, posing special design constraints. While the 0-10% slopes present the fewest limitations on development, only 14.3% of St. Jonn has areas which fall into this classification.

10-20% Slopes. These slopes are still considered buildable yet require special considerations in design. The potential of severe erosion is increased when developing these slopes due to the increased velocity of runoff when vegetative cover is disturbed. In addition, excavation and difficulty in building on steeper slopes increases construction costs. Environmental impacts, as well as increased

Relief

St. John

Plate VI

ATLANTIC OCEAN
CARIBBEAN SEA
Coral Bay
CORAL BAY
0 - 10 %
10 - 20 %
20 - 40 %
40 + %
Slopes
St. John
Plate VII

construction costs should be seriously evaluated when developing on 10-20% slopes. Only 5.4% of the island's surface falls in this category.

20-40% Slopes. 20.5% of St. John has slopes in this range. Development in these areas should be limited to passive uses such as hiking or preservation in order to avoid severe impacts of development. Such impacts would include erosion resulting from increased runoff and clearing of vegetation, as well as, possible pollution of the potable water supply resulting from runoff and seapage from septic systems. Both forms of pollutants potentially endanger the quality of ground water, as well as, bays surrounding the island which possess delicate coral reefs.

40%-over Slopes. Almost 60% (59.8%) of St. John has slopes forty percent or greater. These areas do not occur in any particular section of the island but are found evenly distributed throughout. Severe environmental impacts result when these areas are developed and should be pronibited. Impacts on 40% and over are similar to those on 20-40% slopes, yet more severe. These areas are recommended for limited passive uses or preservation.

Summary

In order to avoid negative environmental impacts, development should be limited to slopes of less than 20%. The total area which falls within the range of 0-20% makes up 19.7% of St. John's 19 square miles. Since buildable land is limited, development should reflect careful planning.

Visual Resources

The Virgin Islands possess a unique and outstanding visual character. The contrasting colors and forms of the green mountainsides against the everchanging blues of the Caribbean Sea are forgotten by few. It is undoubtedly one of the outstanding natural resources of the area, and is responsible for drawing visitors from the world over.

While the quality of aesthetics is perceived and judged by the individual viewer, certain features can be identified as characteristic of an area. This section will not attempt to evaluate the aesthetic quality, rather it will identify the character of the visual resources of St. John, as well as, exemplify the effects of man imposed alteration on these resources. In generating site alternatives, an important factor in determining location will be potential visual impacts of development. In order to accomplish this, a vocabulary, as well as, a method of establishing areas possessing similar visual characteristics has been established.

As a viewer perceives a scene, the mind automatically interprets colors, textures, shapes and sizes into a total composition. The scene is generally interpreted by the viewer as having a certain quality ranging in varying degrees of good to poor. Items which make up the total are referred to as the basic elements or units of the landscape. For example: the color and texture of vegetation combined with the shape of existing land forms may produce the overall appearance of lines as viewed against the sky or sea. Lines may be created by an infinite combination of these units. We see or interpret line as a result of contrast between landscape units. Other factors which influence the

perception include the location of the viewer, atmospheric conditions, and lighting conditions. Since this section presents a general overview of visual resources, the survey was conducted primarily by boat, fixing the location and the distance of the viewer from the area being viewed. The survey was conducted during a one day period, greatly reducing major changes in atmospheric and lighting conditions.

After careful evaluation, it became apparent that major factors influencing the overall visual character include slope (land form) and vegetation patterns.

MAJOR FACTORS

	Slope	Vegetation	
impacts increase ↓	- 10-20% slope	- forest	
	- 20-40% slope	- arid woodlands	
	- slopes over 40%	- wind flattened scrub	impacts increase ↓

Development becomes more visible as the degree of slope increases and the ability of the vegetation to screen development decreases. Forest vegetation on steep slopes has a greater ability to screen development than wind flattened scrub on the same slope. In addition, forest vegetation reestablishes more readily after development, therefore decreasing the overall long term impact.

Slopes	VEGETATION TYPE		
	Forest	Arid Woodlands	Wind Blown Scrub
10-20% slopes	min.	min.	mod.
20-40% slopes	min.	mod.	max.
over 40% slope	mod.	max.	max.

NOTE: min., minimum impacts
mod., moderate impacts
max., maximum impacts

Based on the correlation between slope and vegetation, three categories of impacts have been established: minimum, moderate, and maximum impacts.

Minimum Impacts. Areas possessing gentle slopes and substantial screening vegetation (forest and arid woodland), would be impacted by development (one to two story buildings).

Moderate Impacts. Areas possessing steep slopes and more delicate vegetation would experience moderate alterations in visual character if developed (one to two story buildings). Development in this situation would have a lasting effect on visual resources and would not fully recover to its original character over time.

Maximum Impacts. Areas experiencing maximum impacts as a result of development would include very steeply sloping lands with any type of vegetation. As mentioned previously, development should be restricted on these steeply sloping areas due to environmental complications which may result. Some exceptions to this may be found on St. John however

they are scattered and few. Overall, development of any type should not occur in these areas.

Site Analysis

Each resource and site influence presents special limitations, as well as, opportunities for development. The site analysis, or summary, illustrates the correlation between each of the resource inventories. This comparison results in the identification of potential development cells or areas which reflect the fewest development limitations (see Plate VIII).

All areas of the island possess characteristics which influence the ease or difficulty of development. On St. John three areas emerged as a result of resource evaluation: 1) Areas indicated by Roman numeral I which possess the fewest limitations for development. 2) Areas designated by the number II have moderate limitations. This may include only one major limitation or two moderate. Special considerations will be needed in developing these sites but development is feasible. 3) All remaining cells on St. John fall into undevelopable or the third category. These areas possess resource qualities which have severe limitations for development. Limitations include excessive slopes and restrictive or unstable soils which present severe limitations.

direction
of prevailing
trade winds

summer sun

winter sun

sun

sun

summer sun

winter sun

severe limitations

moderate limitations

slight limitations

Site Analysis

St. John

Plate VIII

3

DEVELOPMENT OF SITE ALTERNATIVES

Chapter 3

DEVELOPMENT OF SITE ALTERNATIVES

In chapter two, documentation and analysis of the survey data produced the program requirements and site analysis. While the program represents basic requirements of the facilities and the site analysis potential sites, further evaluation of these factors in combination result in producing alternatives. In order to focus on sites which best fulfill the program requirements, major objectives of each interest group have been identified.

The community's main objective is to secure adequate land on which to locate a school and cultural center. While other concerns include location, accessibility, and actual facilities, their main objective is to secure an adequate amount of land for the proposed facility.

The Virgin Islands Planning Office is concerned with sound physical planning and encourages development which will fit and improve the existing community. This concern is primarily directed towards the location and accessibility of the proposed development.

Major concentrations of population are located at each end of the island (Cruz Bay west end, and Coral Bay east end), greatest numbers of potential users are located in Cruz Bay. With ever increasing problems of mobility resulting from energy shortages, moving all users to a geographically central site may be diplomatic but not efficient. Logically, the fewer persons transported, the more efficient and

convenient the facility location. Therefore, a community facility located near to the population center is favored.

It has been established that major development on National Park lands is discouraged and that agricultural activity could be possible as long as it is coordinated with the purpose of the park.

To further clarify the results of this study, it is important to stress that the research and development of site alternatives was produced for and in conjunction with the National Park Service. The addition of a third alternative (the National Park Service Trade Alternative) and recommendations regarding site selection were made for this thesis and these go beyond the scope of the N.P.S. study and in no way represent their views or policies.

Size, location, and accessibility were primary factors guiding the choice of site alternatives. The following is a brief description of each (see Plate IX).

Enighed Pond Site

The Enighed Pond site alternative includes the entire area of publicly zoned land in Cruz Bay where the existing school, library, day care center, tennis courts, and the Enighed Great House are located. The total area includes 7.75 acres of prime real estate within the town of Cruz Bay. While the total acreage is not adequate for all uses as outlined in the preliminary program, all facilities with the exception of the track and field could be accommodated within this area. Since a track and field are not listed as a high priority, possible alternative sites such as the new Coral Bay recreational complex could accommodate

ATLANTIC OCEAN

cinnamon bay

herman farm

susannaberg

cruz bay

bethany

gift hill

great cruz bay

location of alternatives

location of agricultural plots

CARIBBEAN SEA

Location of
Site Alternatives

St. John

Plate IX

such a use. Its close location and accessibility to Cruz Bay warrants its consideration as a partial alternative.

N.P.S. Site

The current location of the Virgin Islands National Park Visitor Center is in the town of Cruz Bay. The existing site contains 3.2 acres and includes docks, park offices, a boat maintenance area and a small playground and baseball field. While the site is not large enough for the total development, cultural facilities including an auditorium, multipurpose work areas and offices could be accommodated on the site. These factors warrant its consideration as a partial alternative.

Bethany Site

Located on Center Line Road, this site is easily accessible from Cruz Bay. It is a linear area, consisting of gently sloping hills and fair soils. Much of the area is currently being utilized for grazing and scattered residential. This site has adequate acreage for the proposed facility.

Gift Hill Site

Gift Hill is located near Cruz Bay, however accessibility is limited. While lacking good access, this site possesses more than adequate size and should receive consideration as a potential site.

Great Cruz Bay

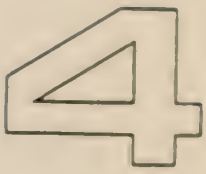
The Cruz Bay site is located near Cruz Bay and is accessible. It possesses ample acreage and good site characteristics for development.

Susannaberg Site

This area, located along Center Line Road is accessible and has adequate acreage for development. However, it lies within the boundaries of the park. If the proposed development were located in this area, measures to realign park boundaries, deleting it from the park, would be necessary.

Two areas Herman Farm and Cinnamon Bay have been indicated on the plan as areas which may be used for agricultural purposes. Suitable areas for agricultural plots are limited on St. John and may result in the major agricultural activity being located at one of these areas.

These six alternatives include sites which are accessible, have an acceptable location and are capable of supporting all or part of the proposed facilities. Further analyses will result in site recommendations.



RECOMMENDATIONS

Chapter 4

RECOMMENDATIONS

In order to establish the most suitable sites, a more detailed evaluation was conducted. In doing so, a chart was developed. This chart represents each site's capability to fulfill program requirements (see Figure 20).

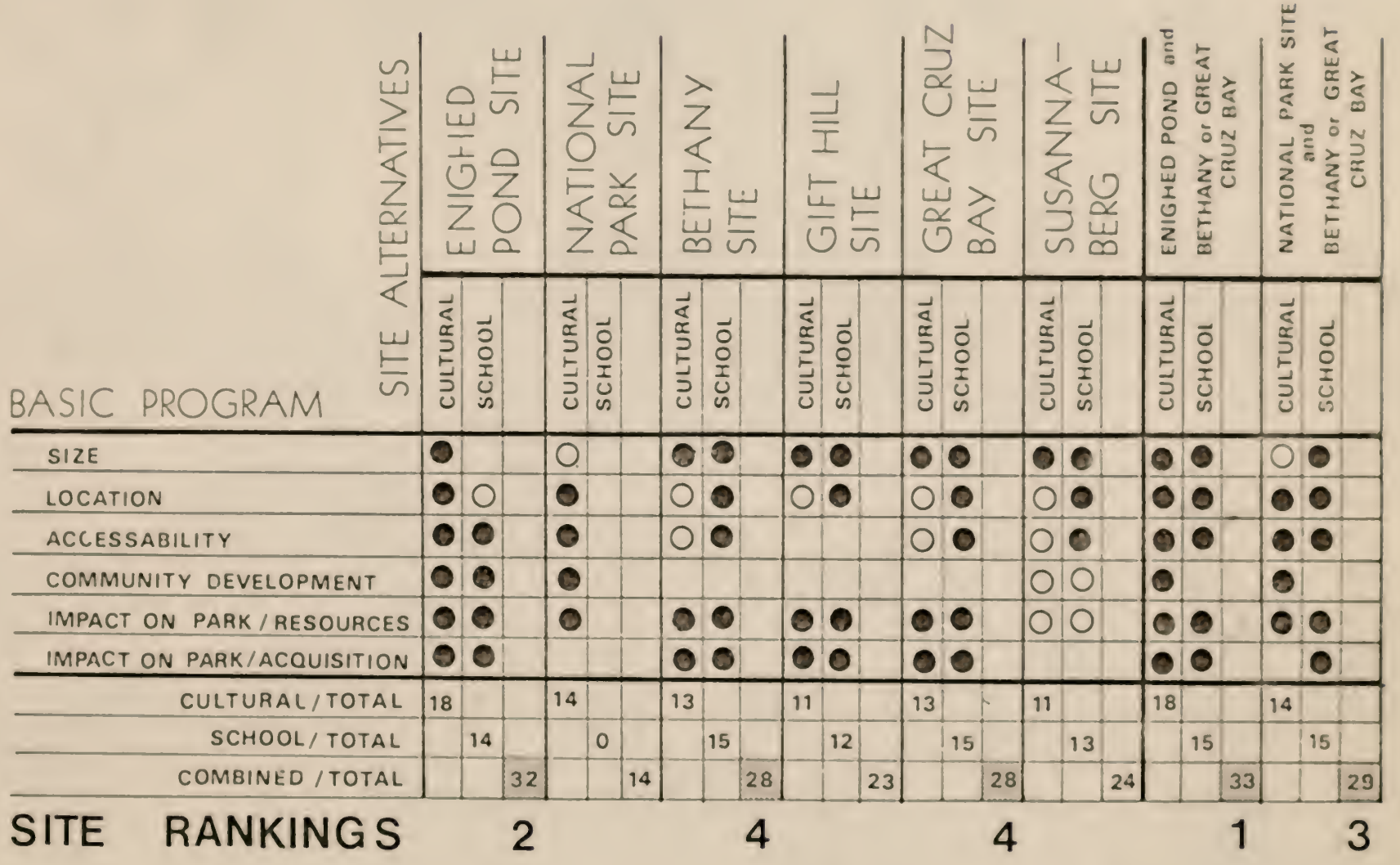
Basic program requirements include the major concerns and needs of each interest group. The community is concerned with size and location of the site. How well each site fulfills the size requirements (set forth in the program) is reflected in the value it receives. Each program requirement is evaluated in the same fashion.

Definition of terms used in the chart are as follows:

Size: Each site was evaluated on the basis of its capability to support proposed facilities and future expansion. If the site could accommodate the proposed use but no future expansion, it was rated "marginal". If expansion is possible, the site was rated "good".

Location: The proximity of each site to Cruz Bay was evaluated. Since school children are more apt to walk or ride buses to school, their location was evaluated less critically than those of the cultural facilities. Sites locating cultural facilities in Cruz Bay were generally rated "good". School sites located away from Cruz Bay activity were rated "good".

Accessibility: While sites may be located near Cruz Bay, they may not be readily accessible due to geographic isolation or lack of adequate



SITE SUMMARY CHART

Figure 20

roads. Sites accessible by existing roads or within a fifteen minute walking distance from town were rated "good". Those with poor roads and/or thirty minute walking time were rated as "marginal".

Community Development Potential: The addition of new facilities to St. John should improve overall character and quality of island life. Sites were evaluated on their ability to fit in with, or improve, overall growth patterns, provide renewal or preservation potential, and improve overall community image. If a site reflected potential of meeting two or more of these objectives it was rated "good"; one "marginal"; none "inadequate".

Impacts on Park/Resources: Any development may affect the natural resources of the area. Sites were rated "inadequate" if development would directly impact park resources. If development would not impact park resources but were located within viewing distance from park boundaries the site was rated "marginal". Other sites were rated "good".

Impacts on Park/Acquisition: A major goal of any national park is to acquire land within its authorized boundary. If land were acquired, for development purposes, inside or adjacent to the boundary, it would conflict with park goals. The overall evaluation may indicate that the sale or trade of park land provides the best solution. While sale of park land may be possible it is not likely due to established precedence and current policy. Based on this, any site requiring acquisition of park held lands was rated "inadequate". All other sites were rated "good". There was no "marginal" rating.

Each site is shown along the top of the chart. Under each there are three columns: the first labeled cultural, the second school. During

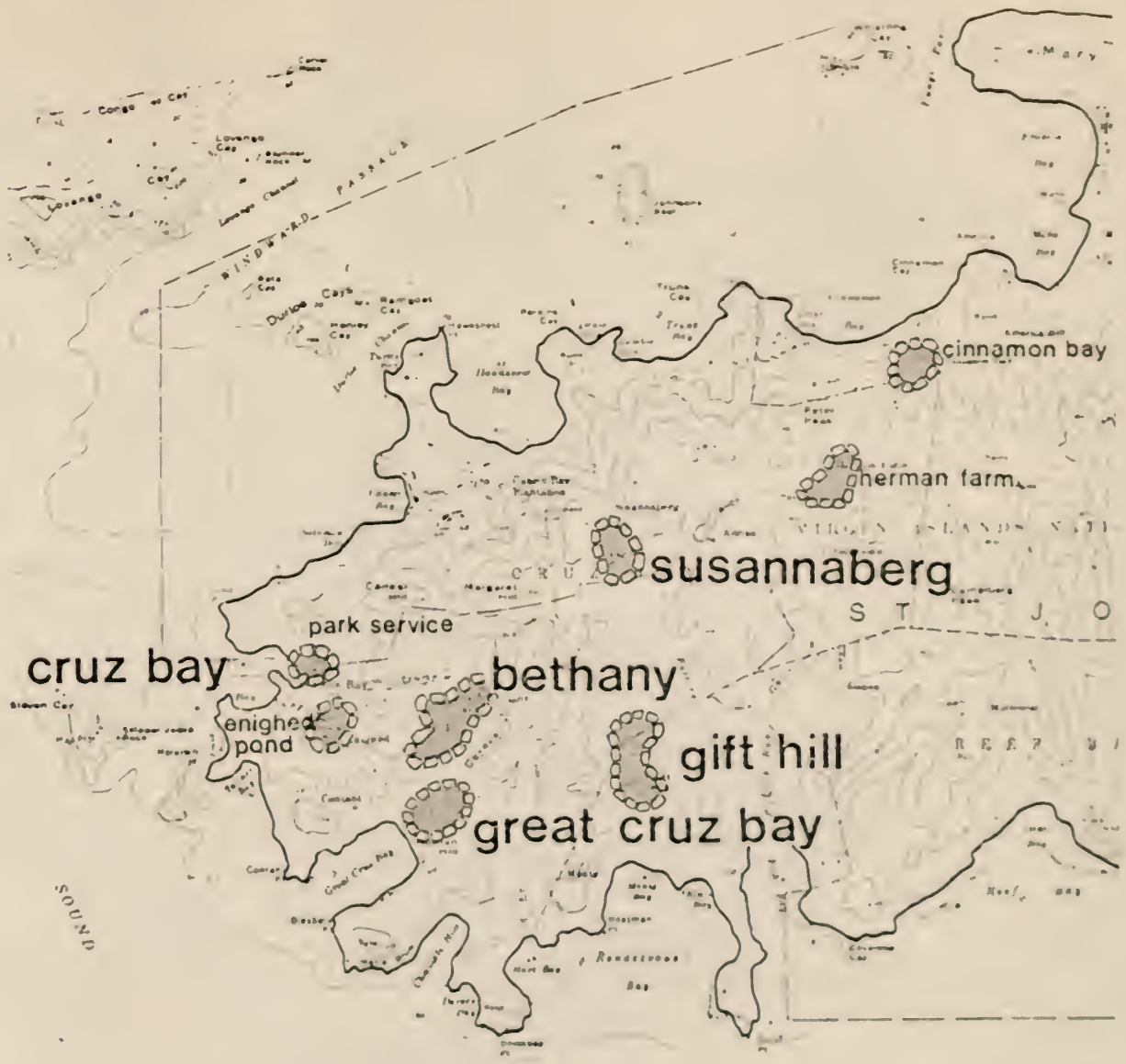
the evaluation process each site is evaluated separately in terms of its capability to fulfill these requirements. The total values for each were combined in the third column, indicating the site's ability to support both.

The numerical value assigned to each symbol reflects the ability of the site to meet program requirements. Three (3) corresponds to the rating of "good", two (2) "marginal", and zero (0) "inadequate". A major division between "marginal" and "inadequate" has been created by assigning zero. By doing so, a site is penalized for completely lacking the capability to satisfy program requirements.

In order to achieve an optimum fit between use and site a split facility has been considered (last two columns). In reviewing the total scores for the "cultural center", Enighed Pond Site ranks first and the National Park Service Site second. By viewing the totals for "school facilities", Bethany and Great Cruz Bay Sites rate equally high. By combining the cultural assets of Enighed Pond or National Park Service with the assets of the Bethany or Great Cruz Bay Sites two additional site potentials are generated; the Enighed Pond/Bethany or Great Cruz Bay Site and the National Park Service/Bethany or Great Cruz Bay Site.

The last total reflects the final ranking of the site's assets. The total combined scores indicate the order of site recommendations first through fourth.

1) Enighed Pond Site and Bethany or Great Cruz Bay
2) The Enighed Pond Site
3) National Park Service and Bethany or Great Cruz Bay
4) Bethany or Great Cruz Bay (see Figure 21).



RECOMMENDED SITE ALTERNATIVES

Figure 21

The numerical ranking of sites indicate that number one, Enighed Pond and an alternative (Bethany or Great Cruz Bay), and two, Enighed Pond Site, are very close - 33 and 32 in their rating. A clear separation between the first two and second two (3 points) recommendations exist indicating a clear preference for the first two. The second two sites, National Park Service and an alternative (Bethany or Great Cruz Bay) and Bethany or Great Cruz Bay, are separated by a single point (29 and 28).

These findings reflect sites which are capable of supporting the proposed community facilities. More importantly, however, they also address the needs and concerns of each interest group providing depth and variety in the approach as well as the solution.

While these recommendations are based on community input and the existing natural resources, additional study is needed prior to actual site selection. It is recommended that additional community input be sought in order to substantiate the current list of needed facilities. Detailed study should be conducted for each site alternative to insure that development will not severely impact the existing site conditions or the environment of St. John.

Further study of these factors along with seeking methods of implementation are needed in order to progress towards the goal of a new community and cultural facility.

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PROPOSAL

AD HOC CITIZENS PLANNING COMMITTEE

Proposal by Ad Hoc Citizens Planning Committee of St. John Island
to the
National Park Service

That a long term special use permit be issued by the National Park Service, USDI, to the Government of the Virgin Islands, for use of approximately 50 acres of federal land, within the Virgin Islands National Park, for the purpose of developing and operating a community center complex for St. John.

The most critically felt civic needs of the 2500 permanent residents of St. John can best be met by development of a single site public community center complex, located so as to be conveniently accessible to both the Cruz Bay and Coral Bay population centers on the island. The location would logically be adjacent to Centerline Road between the two communities.

The community center complex would provide the following needed facilities:

1. A meeting hall with an auditorium seating 600 persons; smaller meeting rooms for community groups for instruction, counselling and passive and creative recreation; and kitchen facilities.
2. Senior and Junior high school buildings and facilities.
3. Athletic facilities for both school and community use.
4. An area of arable land, to be used for youth training programs in agriculture and floriculture, and for intensive cultivation of fruits and vegetables by local residents on small individual plots.

The needs have been documented in a number of planning studies[1] and surveys[2] over the past 15 years.

Selection and acquisition of a suitable site is crucial to successful development of the proposed complex. Criteria[3] in addition to location are road access, level terrain, arable soil and adequate water.

(1) The Overall Planning Committee of St. John Report 1976
(2) The Multi Services Center Report 1970
(3) Annual Reports of Island Administrator
(3) The Overall Planning Committee of St. John Report 1976

No suitable privately owned land is available. Sixty five percent of St. John Island's land area is in the Virgin Islands National Park boundaries; Park lands bisect the Island and separate the two population centers.

The proposed site, not now intensively used, is bounded on three sides by privately owned residential property not subject to condemnation or under a life tenancy agreement; the fourth side is the main cross island roadway, Centerline Road.

The proposed site use would be compatible with park purposes. Under a long term special use permit to the Government of the Virgin Islands, development of the site would proceed with suitable protection and enhancement of Park aesthetic values. As examples, an adequate screen (60-110 feet wide) of native vegetation would be maintained along Centerline Road and the other site boundaries to retain the characteristics of National Park lands. Overall landscaping of the site would serve as a botanical garden, with representative plants and groups of native species appropriately described and labelled.

Funds for development and operation of the center complex would come from federal grants for assistance to disadvantaged youth, senior citizens and civic improvement, as well as private contributions and V.I. Government funds. While no National Park Service appropriated funds would be directly involved, the program would be an enduring example of positive cooperative efforts between federal and local organizations.

MEMBERS, COMMUNITY PLANNING PROJECT

Roy L. Sewer	Government Administration
Elaine I. Sprauve	Government Administration
Julius E. Sprauve	Educator
John Abbink	Interested Citizen
Barbara Abbink	Interested Citizen
Janet Adams	Interested Citizen
Midori Buchanan	Librarian
Austin Dalmida	Dept. of Public Works
Thomas Dowling	Landscape Architect
Sabra Erickson	Interested Citizen
Julien Harley	Public Safety
Mary Holter	Interested Citizen
Louis Jackson	Dept. of Health
Richard Joyce	Interested Citizen
Dinsdale Liburd	Taxidriver
William E. Lomax	Educator
Theovald Moorehead	Real Estate Agent and Contractor
Edward Moorehead	Dept. of Public Works
Alphonse Powell	Public Safety
Vernon Sprauve	Conservation and Recreation
Fiona St. Clair	Interested Citizen
Ruth C.H. Frank	Interested Citizen

Committee Background

In the fall of 1978 in response to informal requests for assistance for representation of St. John Island resicents' views relative to coastal zone management and land-use, Janet Adams, Vice Chairwoman of DoC, NOAA's National Advisory Committee forCoastal Zone Management, asked the Island's Administrator Roy Sewer to invite a representative group of native and continental permanent residents to develop a priority list of solvable needs. Though the invited Committee, by its own resolution, served as an Ad Hoc Committee to expedite conclusions, each member consulted with and brought to each meeting the views of their own constituency for inclusion in the unanimously adopted proposal to the National Park Service.

The Committee meeting regularly over several months:

1. was given access to all previous records of planning committees and annual Administration reports to the Virgin Islands Government.
2. adjudged that previous committee's excellent reports had had inadequate coordinated follow-up.
3. took multiple field trips to study suggested sites.
4. determined that no other island property was even marginally suitable and could not meet long establisned and annually re-affirmed criteria.
5. was informally and enthusiastically assured that full cooperation and technical assistance would be given by the Virgin Island Government when the proposal became a project.
6. concluded that it could guarantee to the Director of the National Park Service the unqualified one hundred percent support of the native population and a near one hundred percent of the continentals.

Proposed Community Center
St. John U.S.V.I.
Preliminary
Proposed Site Analysis

1. Location
   A. Approximately 5 miles from Cruz Bay, 7 miles from Coral Bay
   B. On primary road between main population centers
   C. Boundaries
      1. North - Portion of Estate Hammers Farm - Private Owner.
      2. East - Portion of Estate Hammers Farm - Private Owner.
      3. South - Centerline Road
      4. West - Estate Adrian - Private Owner.
2. Physical Description
   A. 10-20% slopes majority of site
   B. Divides two major watersheds -one running SW the other NE
   C. Plant cover is all 2nd and 3rd growth indigenous trees with some abandon fruit orchards.
   D. Farm pond of approximately 1/5 th acres.
   E. Soils arable 1. and 2.
   F. Prevailing winds from East following normal St. John patterns
   G. Water Supply
      1. Three wells on site
      2. Existing pond
         a. Man made dam
         b. Water all year
      3. Public well field 100 yardsto SW on Centerline Road
   H. Views
      1. Majority are wooded views of site itself
      2. NE quarter offers panoramic views of British V.I.
   I. Access by main island road from both East and West directions.
   J. Utilities
      1. Power lines run parallel to Centerline on South boundary.
      2. Phone lines same locati

3. Existing structures
   A. Abandoned home of one of the previous owners -hazardous condition
   B. Restored ruins of sugar mill owned by park -should be incorporated in site design
   C. Other undeveloped ruins
4. Recommendations - Conclusions
   A. One of the few flat sites on island
   B. Centrally located
   C. Only usable, well located site available
   D. Room for desired uses
   E. Has water, power, views, soil, access, everything to support project.

To fill a need:

Two hundred senior citizens on St. John entitled to the benefits of service programs are inadequately assisted, because there is no adequate facility to house the programs.

Services in operation could be greatly improved.

1. Elderly nutrition programs' hot meals are transported daily by truck , by ferry, to be delivered by truck on St. John. There is no kitchen facility on the island.
2. Transportation program is a wooden benched safari bus, used by the aged for a weekly (one) trip to the beach, and to Calabash Boom (45 mins from Cruz Bay) where one day a week women of exceptional skill make delightful stuffed toys for sale to tourists.
3. Home repairs could be better served by a place to teach skills to the unemployed.
4. Legal Aid could be more useful if an information program or even posters on a centrally located inside bulletin board made the elderly aware of the service.

Not available for lack of a facility is Strive for the visually handicapped; Day Care for the elderly; counselling services; passive pleasurable recreation and instruction.

The Ad Hoc Committee, as had previous Committees, concluded that the elderly, often removed from their native agrarian lifestyle by park land acquisition, are a neglected valuable human and cultural resource. On an island with tourism the primary industry many elderly are willing [1] and qualified to teach native crafts and to develop a craft industry. No local church or the overcrowded school facilities have room for a training or production program.

The disadvantaged youth:

the drop-out without the extra motivation to walk, to bus often more than an hour each way; to a ferry; to again walk to a high school on

(1) Multi-Service survey; Ad Hoc Committee interviews.

a split session schedule; to repeat the process to get home;drops in direct proportion (50% at the East End) to the distance from the ferry ride. The multi-service center survey indicates that the drop-out would welcome the opportunity to learn marketable vocational skills; skills needed to survive in a tourism economy; skills that would be marketable readily to the island's second industry[1]-services to continental retirees.

The general population, the non-disadvantage -the privileged- uses the cultural facilities on St. Thomas but at extreme inconvenience. Concerts, plays, special events require owning a boat or hiring an expensive water taxi.[2] The Ad Hoc Committee believes the entire island population will support and use a cultural community complex intensively. Concerts in the Cruz Bay Park, held under the most difficult and makeshift facilities draw every age group on the island. It would appear that one hundred percent of the West End residents attend and many East Enders.

The middle and uppermiddle class adults are inconvenienced by lack of facilities on St. John. The youth are handicapped, restricted by a lack of a place to practice, to train, to perform. Rehearsal halls, for example, are small rooms in a church, when it does not conflict with church activities, or a bar on the night the bar is closed, an odd atmosphere for a creative youngster.

In conclusion:

There is unanimity that a community center would be used, be supported, be a remarkable example of responsiveness to a real need if a use permit is given to make it possible to start.

Addtl Info:
Janet K. Adams
300-42 Great Cruz Bay Road
St. John, USVI 00830
(809) 776-6571

1 The major full-time employer is the VI Government.

2 The late 'school' ferryis too early for anything but school student use.

TASK DIRECTIVE

TASK DIRECTIVE

DEVELOPMENT OF COMMUNITY AND CULTURAL FACILITIES

FOR

ST. JOHN, U.S. VIRGIN ISLANDS

Major community and cultural needs have been established and documented in the "Proposal by the Ad Hoc Citizens Planning Committee of St. John" and presented to the National Park Service for consideration of a long term use permit. It is the intent of this study to further document community needs, as well as, investigate potential sites inside, as well as, outside authorized park boundaries which are capable of supporting the proposed uses and facilities. In doing so, the study shall be responsive to the needs of the community and the preservation and protection of scenic quality and the natural resources of the Island's environment in accordance with the legislative mandate of the National Park Service.

In order to achieve these goals, a three member task force has been established including one member representing each of the following groups; the citizens and administration of St. John, the Virgin Islands Planning Department, and the National Park Service. Each member will be responsible for providing input from their respective groups, as well as, returning reports of task force progress to them. As the study progresses, meetings between the task force and the representatives from each of these groups will be scheduled.

The method of study will be developed in the following phases; inventory and analysis, preliminary recommendations, and alternatives.

INVENTORY AND ANALYSIS

In order to substantiate the recommendations made at the end of this study, the inventory and analysis phase will focus on two major areas which will include but not be limited to the following:

1. Segment one will attempt to document input from each of the three interest groups, as presented by their respective task force member. It will be the responsibility of each task force member to provide information representative of their group as part of the final report.

    a) Citizens Committee - Establish existing and long term community needs to be served by the proposed facilities.

    b) V.I. Planning Commission - Establish regulations governing the proposed type of development as well as investigate possibilities for obtaining funds for implementation.

    c) National Park Service - Establish the land use restrictions as set forth in the legislative mandate, as well as, investigate the related uses and facilities it may have in common with the community.

From this body of information, a preliminary "design program" will be established. This program will include criteria needed to design the actual facilities, i.e., spacial and use relationships, preliminary space requirements, and land requirements. In addition, estimated impacts will be projected (sewage output, water consumption, electrical, etc.).

2. The second segment of the inventory will attempt to establish all potential sites on the island of St. John, suitable for the development of the proposed facilities. In doing so a preliminary site analysis will be prepared for each, documenting the available natural resources, as well as, projecting the potential effects of development on the site.

PRELIMINARY RECOMMENDATIONS

Upon the completion of the inventory and analysis phase, preliminary recommendations will be made. These recommendations will be responsive to the needs and program requirements established in part one of the inventory and the natural resources of the potential sites established in part two.

ALTERNATIVES

Based on appropriate comments and suggestions brought forth during the review of the preliminary alternatives, final alternatives will be prepared.

In order to achieve the established goals of this study, it is evident that the inventory segment is of critical importance. It would be extremely difficult at this time to develop all the scenarios which will come forth from the inventory and analysis. However, it is apparent that it will provide the justification and direction for the alternatives.

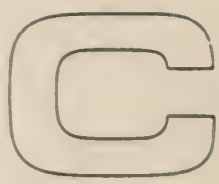
Further, detailed site investigation and impact statements will need to be prepared and ongoing study related to project funding and implementation should be established in order to enable this project to become reality.

SUPPORT

In order to accomplish the intended goals of this study, cooperation of the task force, as well as, the participating interest groups is imperative.

FINAL DOCUMENTATION

Due to the limited time, final documentation will be prepared after the representative of the park service returns to the Denver Service Center. Upon completion of the document, copies will be furnished to the appropriate officials for distribution.



MANAGEMENT POLICIES

I. Preserving our Heritage (I-1 paragraph one)

THE NATIONAL PARK SERVICE PRESERVES AND PROVIDES FOR THE APPROPRIATE RECREATIONAL USE OF NATURAL AND CULTURAL RESOURCES OF NATIONAL IMPORTANCE WITHIN THE NATIONAL PARK SYSTEM AND COOPERATES WITH OTHERS TO PROTECT AND PERPETUATE SIMILAR RESOURCES OF LOCAL, STATE, REGIONAL, NATIONAL, AND INTERNATIONAL IMPORTANCE FOR THE BENEFIT OF HUMANKIND.

II. Park Planning

"Management objectives are required to established the frame work of each park. These set forth conditions to be achieved to realize the park's purpose consistent with service policy."

These objectives are set forth in the General Master Plan (G.M.P) prepared for each park. Once the G.M.P. has been prepared, reviewed by National Park System officials and local citizens at public hearings, appropriate revisions are made and the G.M.P. is approved and adopted. The plan then provides the direction for planning and management of the area. Virgin Islands National Park does not have an approved G.M.P. Preliminary plans have been prepared (latest on 1975) but have never progressed to final acceptance. Therefore, while no specific plan governs V.I.N.P, the N.P.S. policy for management, preservation and protection is clearly set forth by policy and the basic charge entrusted to each park.

The planning process:

Management Zones

Park lands shall be zoned to designate where various strategies for management and use will best fulfill management objectives and achieve the purpose of the park. Such management zoning must be developed in consideration of capability of the land to support identified uses.

Four primary management zones will be recognized--natural, historic, park development and special use. Within this framework, subzones may be designated for any park where desirable to indicate in greater detail how the land or water will be managed. Management zoning (formerly termed "land classification") in existing plans shall remain valid until revised or superseded.

Natural Zone - Lands and waters in this zone will be managed to ensure that natural resources and processes remain largely unaltered by human activity. Developments will either be absent or limited to dispersed recreational and management facilities, such as picnic areas, interpretive displays, and small maintenance stations that are essential for management, use, and appreciation of natural resources.

Historic Zone - This zone includes all lands managed primarily to preserve cultural resources or to commemorate historical subjects. In most cases, lands on or eligible for the National Register of Historic Places will be zoned historic and shall not be rezoned without compliance with the Procedures for the Protection of Historic and Cultural Properties promulgated by the Advisory Council on Historic Preservation (36 C.F.R. Pt. 800). Certain lands not meeting the criteria for listing on the National Register, including local cemeteries and other minor historic sites worthy of protection and interpretation, may also be zoned historic.

Physical development in historic zones shall be the minimum needed for preservation and interpretation of cultural values. Activities in historic zones generally shall be limited to sightseeing and study of the cultural features. However, this limitation shall not preclude or discourage appropriate adaptive use of historic structures for utilitarian purposes or other uses permitted in these policies.

Park Development Zone - Lands in this zone will be managed to support non-historic park development and intensive public use which substantially alter the natural environment. Parking lots, public use roads, agglomerations of buildings, and park utilities will be included in this zone. Developments permitted on other zones do not constitute a development zone. Development zones shall be restricted to the smallest area necessary to accommodate required major development and intensive use. New development zones will be designated only after considering alternative sites (including locations outside the park) and alternative levels of use, facilities, and services.

Special Use Zone - This zone includes lands and waters to be used by other agencies or interests for purposes not permitted in natural, historic, or development zones. Examples include reservoirs, private development, non-Federal open space, and areas supporting or proposed for mining, ranching, and lumbering.

The plans of outside agencies and interests affect and are affected by proposed actions within units of the National Park System. Cooperative planning, therefore, is needed to integrate the park into its regional environment and to ensure that potential conflicts between interdependent actions are minimized or eliminated.

Cooperative planning on specific proposals will be done to ensure that various points of view are considered in formulating proposals and that potential sources of conflict are discovered and, if possible, resolved. Cooperative planning normally will be accomplished utilizing periodic informal workshops in which park planners and representatives of affected interests can frankly discuss matters of mutual concern.

Informal cooperative planning and occasionally formal coordinated planning may be needed in many areas, including but not limited to:

- the provision of facilities and services for visitors within and outside the park, including those provided by NPS concessioners;
- Access to and circulation within the park and region;
- zoning and other land use controls on lands in the park's vicinity;
- protection and preservation of natural and cultural resources in the park and its region;
- provision of technical assistance by other agencies to the National Park Service to facilitate preparation of NPS plans that are relevant to their concerns;
- development of needed Federal, State, or local legislation;
- management of historic districts;
- management planning or regulation of facilities or activities by other agencies within the park or its region which have effects on the park's environment, such as reservoirs, highways, flood control projects or pollution control.

PUBLIC PARTICIPATION IN PLANNING

Parks are public properties and the opportunity for the public to voice their concerns regarding planning and management of the parks must not be abridged. The National Park Service will take positive actions to involve the public as individuals and through public interest groups and organizations at the earliest possible stage in the planning process before the planning decisions have been made. The following sections describe opportunities for public involvement that may be available for any particular plan.

Formal Public Workshops and Meetings

Public workshops and meetings may be held to inform the public that a plan is being prepared; to exchange information during the planning process; and to bring to light public concerns, particularly with regard to controversial issues. These workshops and meetings will be announced in the Federal Register, regional newspapers and public media. A record will be kept of the proceedings.

INFORMAL WORKSHOPS

Once the planning process is underway, informal workshops may be held between the multidisciplinary planning team and members of the public to acquire information on technical aspects of the plan, public concerns, and matters of existing or potential conflict.

PUBLIC REVIEW OF THE ASSESSMENT OF ALTERNATIVES

An opportunity for public review of the Assessment of Alternatives will be provided so that the public can evaluate various alternatives considered during

the planning process up to this point; present other alternatives for consideration; comment on the content of the analysis; and uncover discussion issues of existing or potential conflict. Assessments of Alternatives will be available for public review for a period of no less than 30 days (60 days is recommended).

PUBLIC COMMENT ON THE DRAFT ENVIRONMENTAL STATEMENT

The draft environmental statement, when prepared, will be circulated to the public in accordance with Departmental Manual Part 516 DM 2 and applicable guidelines of the Council on Environmental Quality and the National Park Service. The public will have the opportunity to provide written comments on the draft environmental statement to which the National Park Service will respond in writing. Changes in the plan and its draft environmental statement will be made as appropriate in light of public comments. The draft environmental statement will be available for public review for a period of no less than 45 days prior to a public meeting or an administrative decision.

ADDITIONAL MEETINGS

Public meetings on the plan and its draft environmental statement may be held to obtain additional public comments, particularly on major controversial proposals or public concerns.

III. Park Facilities

DESIGN AND CONSTRUCTION CONSIDERATION

DESIGN QUALITY AND CONTROL

Only those physical facilities needed for management and appropriate public use and enjoyment shall be provided in a park area, and then only at sites designated on approved plans.

Where new facilities are needed, the Service will employ quality design of a high aesthetic and functional caliber. Facilities will be integrated into the park landscape so as to cause minimum impact.

INTERPRETIVE FACILITIES

The Services will provide facilities for informational, interpretive, and visitor use programs in order to help the visitor appreciate and enjoy the park and understand its significance. Innovation and experimentation are encouraged in park interpretive and visitor use programs where they are not inconsistent with policy, park purpose, and objectives.

Visitor Center - Where necesaary to provide essential visitor use information, interpretation and certain administrative functions, visitor centers may be constructed at locations identified on approved plans.

Visitor centers must not be a substitute for personal and self-guiding interpretation that is provided on the site of prime park resources. Accordingly, new visitor centers will be constructed

Only when it has been determined thatindoor media are the most effective means of communicating major ele ments of the park interpretive story and that a central public contact point is needed.

To minimize visual intrusion upon natural or historic resources, visitor centers normally are not located within close proximity to major park features.

As appropriate, a visitor center may include facilities for audio-visual programs, museums, visitor transportation facilities, and other staffed or self-help programs necessary for a quality visitor experience.

Historic structures may be used for visitor centers when compatible with their preservation, park purpose, and management. Consistent with policies on treatment and use of historic structures, adaptive use of structures other than those in Category Ia for visitor centers is ordinarily preferable to the development of modern facilities and the corresponding burden of preserving historic structures not open for visitation.

Amphitheatres - Amphitheatres may be provided at campgrounds and other locations where the provision of formal interpretive programs is desirable. Campfire circles may be provided in campgrounds for a variety of evening programs and to encourage informal social gatherings.

Wayside Exhibits - Wayside exhibits may be provided along roads and heavily-used walks and trails to interpret park resources on site.

ACTIVITIES AND FACILITIES FOR ARTS AND CULTURE

The National Park Service does not support the establishment of further units of the National Park System specifically for the performing arts. However, various cultural facilities and events (concerts, plays, etc.) do occur in the parks, particularly in the National Capital Region. Cultural productions and programs are permissible. These may include but need not be limited to musical productions, films, lectures, plays, crafts (modern and traditional), and art exhibits. Artist-in-the-park programs are encouraged, as are other activities designed to give perspectives on the parks through the arts. Cultural productions and other cultural activities must be consistent with each park's purpose and objectives.

Permanent facilities should be built specifically for cultural activities in units of the National Park System only when all of the following criteria are met:

- It is impossible or impractical to use demountable or temporary facilities.
- It is impossible to adapt the activities to other park facilities not provided expressly for this purpose.
- The permanent facility is required for programs of primary importance in conveying the park story.
- Neither the construction of the facility nor its operation impairs cultural or natural resources or hinders the use of the park for its intended purpose.
- The facility cannot feasibly be provided by others adjacent to, or out of , the park.

IV. Natural Resource Management

National Park Service planning provides for zoning of all park lands in one or all of four land classificiations: natural, historic, park development and special use. Use and resource management within these zones and subzones are guided by the management policies and carried out through the planning process.

RESOURCE UTILIZATION

As a general policy, the Service does not allow consumptive utilization of renewable or non-renewable park resources. However, the diversity of parks within the System, the occurrence of rights and privileges relating to resource uses continuing from prior to the establishment of certain parks, specific provisions of legislation, and management needs require exceptions and modifications for the management of the System. Where consumptive uses are permitted by law, and where it can be demonstrated that they are detrimental to the purpose of a park, the Service will recommend their elimination, limitation, curtailment, or modification through the legislative process.

AGRICULTURAL USES

Historic Zones - In historic zones, agricultural activities, including demonstration farms, are permitted where they conform to those that occurred during the historic period and where they do not detract from the principal interpretive purposes.

Agricultural uses that do not conform to those in practice during the historic period arepermitted where they contribute to the maintenance of a historic scene, are permitted by law, or are required pursuant to acquisition agreements or similar documents.

Agricultural Subzone - Agricultural practices may be permitted to achieve desirable land uses, in accordance with the area's theme and objectives. Leases or special permits may be issued for the management by others of such agricultural and wildlife enhancement land.

V. Cultural Resource Management and Preservation

COMPATIBLE USE OF HISTORIC STRUCTURES

Use of historic structures for political, religious, or educational meetings shall be governed under conditions established in "Limitations of Use on Historic Structures." Such uses are permitted when compatible with the primary purposes of the area and consistent with the preservation of the historic resource. They must not conflict with ordinary public use of the area and must usually be scheduled to avoid the hours of maximum visitation. The topical content of meetings--political, religious or otherwise--shall not be a factor in issuing permits.

The use of a historic structure for social gatherings or entertainments may be permitted only if the use is compatible with the primary purposes of a park, if it does not threaten impairment of the structure or its contents, and if it does not conflict with ordinary use of the park.

VI. Wilderness Preservation and Management

This section not applicable due to V.I.N.P. not being designated as a wilderness area.

VII. Use of the Park

THE NATIONAL PARK SERVICE IS CHARGED WITH PROVIDING FOR THE ENJOYMENT, APPRECIATION, AND UNDERSTANDING OF PARK RESOURCES AND VALUES BY THE PEOPLE: WITH CONTROLLING USES THAT COULD IMPAIR PARK RESOURCES OR THEIR ENJOYMENT BY VISITORS: AND WITH VISITOR PROTECTION AND SAFETY.

The Service's mandate requires that it carefully plan and regulate the use of the parks so that park resources are perpetuated and maintained unimpaired for the enjoyment of future generations. Thus, the limits and kinds of use are circumscribed by requirements of resource management and protection. Use of the National Park System is essentially resource based but is not consumptive of the resource. In order for public use to be safe, lawful, and of minimum adverse impact, park visitors need to be informed of their options for use of the parks, and they need help in planning their park visit. This requires that the Service analyze and plan for acceptable forms of park use and help the visitors structure their time to the appropriate activities.

In order to promote and regulate appropriate park use, the Service will ensure provision, in or near most parks, of a variety of services which satisfy the health, safety, sustenance, and accommodation needs of the public.

INTERPRETIVE PRESENTATIONS

Living history programs, living farms, interpretive demonstrations, programs utilizing the creative and performing arts, arts and crafts, or the demonstration and teaching of recreational skills and other non-traditional activities that are designed to enhance the understanding of a park's resources or enrich the experience of the park visitor are encouraged when they directly relate to an important site-related resource or theme identified in an approved planning document. Interpretive presentations complement, but do not replace other means of accomplishing interpretive objectives.

Because of their potential impact on visitor experiences and the park's resources, interpretive presentations entail special obligations and, therefore, when adopted shall be consistent with the following criteria:

- Such programs must be safe for participants and spectators and must comply with all Service standards for demonstration safety.
- Presentations interpreting the history of an area must achieve high standards of historical accuracy, both in content and in the costumes, equipment, etc., used, and must directly support the central historical theme or associations of thepark.
- Presentations involving the use of creative or performing arts or arts and crafts, media and techniques must be of a quality that meets the professional standards in that technique or media.
- Any construction or other development of cultural or natural resources necessary for interpretive presentations must be

consistent with the Service's policy, and in all cases the presentation must be conducted in a manner that protects the resources from damages or destruction.

- Large-scale, complex reenactments, especially of battles, are not permitted.

- An evaluation of possible impact of presentations on original historic objects will be made by qualified professionals, and accurate reproductions will be substituted whenever there is any significant possiblity of wear, breakage, or theft.

- Presentations designed to teach or upgrade outdoor recreational skills or leisure time acitivities should be limited to those activities relevant to the resources or themes of the area; should include safety and emergency preparedness information germane to that activity; and should be designed to help minimize possible impacts on the resources that can result from that activity.

ENVIRONMENTAL EDUCATION

Achievement of the Service's dual mandate of resource preservation and provision for public enjoyment is dependent on the attitudes of visitors toward parks, and the way in which each visitor experiences and uses the park's resources. To these ends the Service will plan and carry out environmental education programs that offer visitors the opportunity to learn, at the conscious level, about the forces that shape and maintain our environment and to realize that people are an integral part of that environment, and that any single action any individual takes has an uncountable number of impacts.

In addition to our regular interpretive programs and the examples we set by the way we use and manage the resources of our parks, the Service will

provide assistance to teachers, organized groups, and educational institutions which use the park resources in their environmental studies through such programs as

- The National Environmental Education Development (NEED) Program
- The National Environmental Study Area (NESA) Program
- The National Environmental Living Program

The Service will also privde technical assistance and information to others in developing their own environmental study areas and programs, and in establishing National Environmental Education Landmarks (NEELS).

COOPERATING ASSOCIATIONS

Foundation and operation of cooperating associations or agencies or existing associations to facilitate the conservation, education, and interpretive programs of a park, as authorized under the National Park Service Functions Act, August 7, 1946 (P.L. 79-633), shall be encouraged where they contribute to the management of the park. Based on a written cooperative agreement, cooperating associations may produce and sell interpretive items such as publications maps, visual aids, handicrafts, and other objects that are directly related to the understanding and interpretation of the park.

RECREATIONAL ACTIVITIES

The Service encourages those recreational uses which draw their meaning from association with, and direct relation to, park resources, and which are consistent with the protection of such resources. Recreation uses which do not fit the above description may be provided in certain areas under careful regulation and control, as spelled out in statements contained below.

NONTRADITIONAL RECREATIONAL USES

Certain outdoor recreational activities which are not necessarily dependent upon park resources for their realization, and which do not constitute traditional or customary park uses, may be permitted when they do not:

- interfere with normal park usage;
- constitute a consumptive form of use;
- have an undesirable impact on park resources;
- compromise the hsitoric or natural scene; or
- present a danger to the public welfare and safety, including safety of the participants.

Such recreational uses shall be governed as follows:

1. The time and place for such activities shall be controlled, by permit if necessary, to avoid:
   - infringement upon the enjoyment and rights of other park visitors;
   - traffic congestion;
   - injury to nonparticipants and damage to property;
   - disruption of normal park operations; and
   - unwarranted risk to participants due to inadequate equipment, lack of qualifications, weather, or other factors.
2. Special areas and conditions may be designated to separate these activities from other park uses. When an activity is hazardous, minors may be required to have a parent's or guardian's permission to participate. Areas may be closed to such uses, in whole or in part, if it has been determined that the activity presents a substantial threat to life or a real possibility of bodily injury. The number of participants permitted to engage in an

activity during a given period may also be regulated.

3. Participants may also be required to enter into an agreement for reimbursing the United States for search, rescue, and recovery, or to provide qualified personnel to assume that responsibility.

4. These uses shall not take the form of special events or be provided primarily for the benefit of spectators. They shall not be practiced for material or financial gain by the participants, either directly or indirectly, and there shall be no commercialization, advertising, or publicity by the participants.

5. This policy shall be compatible with and subject to:

   - the regulations imposed on any such activity by appropriate Federal and State agencies, and
   - applicable safety and equipment standards endorsed by responsible sanctioning organizations.

   It shall not be extended to permit the use of any type of motor-driven craft or vehicle not presently allowed in park areas. Special regulations may be promulgated to regulate these uses.

OUTDOOR SPORTS

In designated portions of urban recreational parks, such as those in the National Capital Region, participation in active outdoor sports is a desirable form of park use, and opportunities will be provided for such use. These activities may include, but not be limited to: field sports (baseball,

softball, soccer, stick hockey, etc.), golf, tennis, badminton, and shuffleboard.

These activities may be provided for in combination with developed areas, swimming areas, or other intensive use areas, or may be provided separately. Such activities will be provided only to the extent that they are not inconsistent with the protection and perpetuation of natural or historic features of an area, and do not interfere with normal park use.

Historic zones with sizable areas of open meadow land may accommodate outdoor sports and activities where no facilities are required and where such use does not impair the historic environment or interfere with the use and appreciation of the historic resources.

Facilities for outdoor sports are generally inappropriate in natural zones but may be provided on a modest scale (i.e., volley ball areas, unimproved ball fields, etc.) in connection with overnight youth camps or environmental education facilities.

LEGISLATION AND AGREEMENTS

August 2, 1956
[H. R. 5299]

AN ACT

To authorize the establishment of the Virgin Islands National Park, and for other purposes.

Virgin Islands National Park.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That a portion of the Virgin Islands of the United States, containing outstanding scenic and other features of national significance, shall be established, as prescribed in section 2 hereof, as the "Virgin Islands National Park".

Administration.

The national park shall be administered and preserved by the Secretary of the Interior in its natural condition for the public benefit and inspiration, in accordance with the laws governing the administration of the national parks (16 U. S. C. 1, and the following).

39 Stat. 535.

Conditions and limitations.

SEC. 2. The Secretary of the Interior is hereby authorized, subject to the following conditions and limitations, to proceed in such manner as he shall find to be necessary in the public interest to consummate the establishment of the Virgin Islands National Park:

(a) The acreage of the national park shall be limited to a total of not more than nine thousand five hundred acres of land area, such total to be comprised of not more than fifteen acres on the island of Saint Thomas, and not more than nine thousand four hundred and eighty-five additional acres to be comprised of portions of the island of Saint John and such small islands, rocks, and cays not in excess of five hundred acres in the general vicinity thereof as may be desirable for inclusion within the park:

(b) Tentative exterior boundary lines, to include land not in excess of the aforesaid acreage limitations, may be selected for the park in order to establish the particular areas in which land may be acquired pursuant to this Act, such tentative boundaries to be selected and adjusted as may be necessary by the Secretary of the Interior;

(c) The Secretary, on behalf of the United States, is authorized to accept donations of real and personal property within the areas selected for the park until such time as the aforesaid total of nine thousand five hundred acres shall have been acquired for the park by the United States, and he may also accept donations of funds for the purposes of this Act;

(d) Any Federal properties situated within the areas selected for the park, upon agreement by the particular agency administering such properties that such properties should be made available for the park, may be transferred without further authorization to the Secretary by such agency for purposes of this Act;

(e) Establishment of the Virgin Islands National Park, in its initial phase, shall be and is hereby declared to be accomplished and effective for purposes of administration when a minimum acreage of not less than five thousand acres in Federal ownership for purposes of this Act shall have been acquired by the United States in specific areas containing such acquired lands to be designated by the Secretary; and

Publication in FR.

(f) Notice of the establishment of the park as authorized and prescribed by this Act shall be published in the Federal Register.

Appropriation.

SEC. 3. There is hereby authorized to be appropriated from Federal funds a sum not in excess of $60,000 for capital improvements for said Virgin Islands National Park, and a sum of not in excess of $30,000 annually for the administration of the Virgin Islands National Park.

Approved August 2, 1956.

Public Law 85-404

May 16, 1958
[S. 2161]

AN ACT

To amend the Act of August 2, 1956 (70 Stat. 940), providing for the establishment of the Virgin Islands National Park, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Act of August 2, 1956 (70 Stat. 940), entitled "An Act to authorize the establishment of the Virgin Islands National Park, and for other purposes" is hereby amended by striking section 4 therefrom.

16 USC 398.

Approved May 16, 1958.

Public Law 87-750

October 5, 1962
[S. 2459]

AN ACT

To revise the boundaries of the Virgin Islands National Park, Saint John, Virgin Islands, and for other purposes.

Virgin Islands National Park, Saint John, V.I. Boundary revision.
16 USC 398, 398a.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, in furtherance of the purposes of the Act of August 2, 1956 (70 Stat. 940), as amended, providing for the establishment of the Virgin Islands National Park, and in order to preserve for the benefit of the public significant coral gardens, marine life, and seascapes in the vicinity thereof, the boundaries of such park, subject to valid existing rights, are hereby revised to include the adjoining lands, submerged lands, and waters described as follows:

NORTH OFFSHORE AREA

Beginning at the hereinafter lettered point A on the shore of Cruz Bay, a corner in the Virgin Islands National Park boundary, being also a corner of lot F, Cruz Bay, added to the park by order of designation signed June 29, 1960, by the Assistant Secretary of the Interior pursuant to the Act of August 2, 1956 (70 Stat. 940), and published in the Federal Register of July 7, 1960, the said corner being the terminus of the course recited therein as "north 38 degrees 30 minutes west a distance of 20.0 feet, more or less, along Government land to a point;" for the third call in the metes and bounds description lot F, Cruz Bay.

25 F R 6408.

From the initial point A, distances in nautical miles, along direct courses between the hereinafter lettered points at geographic positions (latitudes north, longitudes west):

Northwestward approximately 0.13 mile to point B, latitude 18 degrees 20 minutes 08 seconds, longitude 64 degrees 47 minutes 45 seconds in Cruz Bay;

0.43 mile to point C, latitude 18 degrees 20 minutes 08 seconds, longitude 64 degrees 48 minutes 10 seconds in Pillsbury Sound;

1.36 miles to point D, latitude 18 degrees 21 minutes 30 seconds, longitude 64 degrees 48 minutes 10 seconds in Windward Passage;

1.64 miles to point E, latitude 18 degrees 22 minutes 10 seconds, longitude 64 degrees 46 minutes 35 seconds in the Atlantic Ocean;

1.99 miles to point F, latitude 18 degrees 22 minutes 45 seconds, longitude 64 degrees 44 minutes 35 seconds in the Narrows;

3.18 miles to point G, latitude 18 degrees 22 minutes 00 seconds, longitude 64 degrees 41 minutes 20 seconds in Sir Francis Drake Channel;

1.04 miles to point H, latitude 18 degrees 21 minutes 10 seconds, longitude 64 degrees 40 minutes 40 seconds in Hanlover Bay;

Southwestward approximately 0.22 mile to point I, a bound post on the shore of Hanlover Bay marking a corner of the Virgin Islands National Park boundary as shown on drawing numbered NP-VI-7000 entitled "Acquisition Area Virgin Islands National Park", approved November 15, 1956, by the Acting Secretary of the Interior in accordance with the provisions of the Act of August 2, 1956, *supra*, being also the southeasterly corner of estate Hanlover 5a and 5c east end quarter as delineated on the municipality of Saint Thomas and Saint John drawing PW ale numbered 9-24-T51 dated October 28, 1950;

Thence running generally westward along the Virgin Islands National Park northerly boundary as it follows the northerly shore of the island of Saint John as shown on the said drawing numbered NP-VI-7000 and on drawing numbered NP-VI-7025 entitled "Land Ownership Cruz Bay Creek" depicting the boundary adjustment effected by the said order of designation to point A, the point of beginning.

The area described contains approximately 4,100 acres.

SOUTH OFFSHORE AREA

Beginning at the hereinafter lettered point L, a concrete bound post on the shore of Drunk Bay marking a northeasterly corner in the Virgin Islands National Park boundary as shown on the said drawing numbered NP-VI-7000, being also the northeasterly corner of parcel numbered 1, estate Concordia (A), as delineated on the Leo R. Sibilly, civil engineer, drawing file numbered C9-13-T55.

From the initial point L, distances in nautical miles, along direct courses between the hereinafter lettered points at geographic positions (latitudes north, longitudes west):

Eastward approximately 0.32 mile to point M, latitude 18 degrees 18 minutes 48 seconds, longitude 64 degrees 41 minutes 50 seconds in Sabbat Channel;

0.88 mile to point N, latitude 18 degrees 17 minutes 55 seconds, longitude 64 degrees 41 minutes 50 seconds in the Caribbean Sea;

0.40 mile to point O, latitude 18 degrees 17 minutes 55 seconds, longitude 64 degrees 42 minutes 15 seconds in the Caribbean Sea;

1.88 miles to point P, latitude 18 degrees 18 minutes 48 seconds, longitude 64 degrees 44 minutes 00 seconds in the Caribbean Sea;

1.74 miles to point Q, latitude 18 degrees 18 minutes 48 seconds, longitude 64 degrees 45 minutes 50 seconds in the Caribbean Sea;

0.45 mile to point R, latitude 18 degrees 19 minutes 15 seconds, longitude 64 degrees 45 minutes 50 seconds in Fish Bay;

Eastward approximately 0.08 mile to point S on the shore of Fish Bay, a corner in the present Virgin Islands National Park, as delineated on said drawing numbered NP-VI-7000, being the northwesterly corner of parcel numbered 2 estate Fish Bay, numbered 8 Reef Bay Quarter, and the terminus of the delineated course "south 78 degrees 52 minutes west distance 1,178.9 feet" as depicted on the Leo R. Sibilly, civil engineer, drawing file numbered G9-385-T56.

Thence running generally eastward along the present southerly park boundary as it follows the southerly shore of the island of Saint John as depicted on the said drawing numbered NP-VI-7000 to point L, the point of beginning.

The area described contains approximately 1,550 acres.

Lands, submerged lands, and waters added to the Virgin Islands National Park pursuant to this Act shall be subject to administration by the Secretary of the Interior in accordance with the provisions of the Act of August 25, 1916 (39 Stat. 535; 16 U.S.C. 1–4), as amended and supplemented.

Acquisition of lands, etc.

16 USC 398, 398a.

SEC. 2. Within the boundaries of Virgin Islands National Park as established and adjusted pursuant to the Act of August 2, 1956 (70 Stat. 940), and as revised by this Act, the Secretary of the Interior is authorized to acquire lands, waters, and interests therein by purchase, exchange or donation or with donated funds.

SEC. 3. Nothing in this Act shall be construed as authorizing any limitation on customary uses of or access to the areas specified in section 1 for bathing and fishing (including setting out of fishpots and landing boats), subject to such regulations as the Secretary of the Interior may find reasonable and necessary for protection of natural conditions and prevention of damage to marine life and formations.

SEC. 4. There are hereby authorized to be appropriated such sums, but not more than $1,250,000, as are necessary to acquire lands pursuant to section 2 of this Act.

Approved October 5, 1962.

CODE OF FEDERAL REG.
1971 Edition

§ 7.74 Virgin Islands National Park.

(a) *Submerged features.* (1) No person shall cut, carve, injure, mutilate, remove, displace or break off any underwater growth or formation. Nor shall any person dig in the bottom, or in any other way injure or impair the natural beauty of the underwater scene. No rope, wire or other contrivance whether such contrivance is temporary or permanent in character or use shall be attached to any coral, rock or other underwater formation.

(2) No person shall destroy, mark, deface, displace, remove or tamper with any underwater sign, notice, float, placard or underwater device.

(b) *Marine operations.* No dredging, excavating or filling operations of any kind are permitted, and no equipment, structures, by-products or excavated materials associated with such operations may be deposited in or on the waters or ashore within the boundaries of the Park.

(c) *Wrecks.* No person shall destroy, molest, remove, deface, displace or tamper with wrecked or abandoned waterborne craft of any type or condition, or any cargo pertaining thereto unless permitted in writing by an authorized official of the National Park Service.

(d) *Boats.* (1) No watercraft shall be operated in such a manner, nor shall anchors or any other mooring device be cast or dragged or placed, so as to strike or otherwise cause damage to any underwater features.

(2) Anchoring or maneuvering watercraft within the waters that contain underwater marked swimming trails and interpretive signs is prohibited.

(3) Vessels desiring to enter Trunk Bay must enter and depart between the two outer buoys delineating the prescribed anchorage area, and shall anchor within described area, and no other, making sure the vessel will lie within that area regardless of wind or tide conditions: Except, that hand-propelled craft may be used to transport passengers and equipment between the anchorage area and the beach.

(4) All vessels carrying passengers for hire shall comply with applicable laws and regulations of the United States Coast Guard and Territory of the Virgin Islands.

(e) *Fishing.* (1) Taking of fishes or any other marine life in any way except with rod or line, the rod or line being held in the hand, is prohibited: *Provided*, That fish may be taken by pots or traps of conventional Virgin Islands design and not larger than five feet at the greatest dimension, and bait fish may be taken by nets of no greater overall length than 20 feet and of mesh not larger than 1 inch stretched: *Provided further*, That subparagraphs (3), (4), and (5) of this paragraph shall apply.

(2) The use of possession of any type of spearfishing equipment within the boundaries of the park is prohibited.

(3) The species of crustaceans known as Florida Spiny Lobster (Panulirus argus) may be taken by hand or hand-held hook. No person shall take female lobsters with eggs; or take more than two lobsters per person per day; or have in possession more than two day's limit: *Provided*, That subparagraph (5) of this paragraph shall apply.

(4) Species of mollusks commonly known as whelks and conchs may be taken by hand. No person shall take more than two conchs or one gallon of

whelks, or both, per day, or have in possession more than two days' limit: *Provided*, That subparagraph (5) of this paragraph shall apply.

(5) All known means of taking fish, crustaceans, mollusks, turtles, or other marine life are prohibited in Trunk Bay and in other waters containing underwater signs and markers.

[29 F.R. 17091, Dec. 15, 1964]

UNITED STATES

DEPARTMENT OF THE INTERIOR

National Park Service

The College of the Virgin Islands

Virgin Islands Ecological Research Station

Memorandum of Agreement

WHEREAS, the Act of August 25, 1916, 39 Stat. 535 and amendments thereto, 16 USC I (1964), declares that the National Park Service shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations by such means and measures as conform to the fundamental purpose of the parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations; and

WHEREAS, the Service has a site for the establishment of an ecological research station in Virgin Islands National Park (hereinafter known as the Park) and a foreseeable need for extensive ecological and other natural scientific research within and in the vicinity of the Park; and

WHEREAS, such research performed in or in the vicinity of the Park whether performed and financed by the College of the Virgin Islands or performed and/or financed by other persons or institutions, will be valuable and necessary for the management and interpretation of natural resources contained in the Park; and

WHEREAS, the College of the Virgin Islands (hereinafter known as the College) through its Virgin Islands Ecological Research Station (hereinafter known as the Station), has or is able to obtain qualified personnel to conduct such research as may be desirable and necessary within and in the vicinity of the Park and is in search of a location where such research can be conducted under as nearly as possible natural ecological conditions, such as are found in the Park; and

WHEREAS, it appears advantageous to the United States to enter into an agreement with the College in order to facilitate the desirable research;

NOW, THEREFORE, in consideration of the mutual covenants hereinafter set forth, the parties hereto agree as follows:

Article I. The College agrees to:

(a) Establish a high quality field station from which work in the areas of basic and applied research, education, and conservation can be accomplished. Caribbean marine and terrestrial environments are considered to be equally important; and

(b) Provide a laboratory building or buildings and associated facilities and utilities to be located according to Service Master Plans for the Park and constructed to exterior design and specifications acceptable by the Service; and assumes responsibility for the maintenance and upkeep of the building(s), adjacent grounds, other facilities and utilities thus provided, which shall be in keeping with Service standards; and

(c) Encourage use of the Station, to the limits of available space, by students, graduate students, university instructors and professors, and other qualified research personnel, in order to enhance the accumulation of knowledge concerning the natural environments, ecosystems and species of the Virgin Islands area; and

(d) Make Station facilities available for research purposes without regard to the organizational or institutional affiliations of research personnel, but with regard to project importance and value in the Station's research program as the primary criterion; and

(e) Publish the results of such investigations as promptly as possible within the dictates of sound scholarship and the provisions of such contracts as may be entered into between the College and the Service for specific investigations; and

(f) Provide the Service with copies of any published and unpublished reports resulting from investigations; and

(g) Collect specimens, for research or other purposes, in conformance with Service rules and regulations, when such collections are made within the Park; deposit normally shall be at the Station, but special consideration for the use and disposition of specimens may be obtained by written specifications on collection permits or by subsequent written authority; and

(h) Make available collections maintained at the Station for on-site inspection by other researchers and Service personnel; and

(i) Maintain discipline of students, employees, visiting research personnel, and others associated with the Station, so that normal operations of the Park will not be hampered, and so that there is full compliance with Service and Park rules and regulations contained in Title 36 of the Code of Federal Regulations, including prohibitions against the introduction of exotic organisms into the Park, and against

destruction or alteration of Park landscapes, biota, and ecosystems, unless such introductions or alterations receive prior written authorization from the Service; and

(j) Furnish to the Service upon request administrative and/or financial records concerning the operation of the Station; and

(k) Comply with the terms of Section 202 of Part II of Executive Order 11246 dated September 24, 1965, which is attached hereto and made a part of this agreement, in the performance of work under this agreement and any supplemental agreements which may result from this agreement (substituting the word "college" for "contractor").

Article II. The Service agrees to:

(a) Assign a development site in the Lameshur Bay area of the Park, in accordance with the Park Master Plan, for the construction of the initial Station facility; and assign an additional site or sites in the Park, as appropriate to the needs and best interests of and with the concurrence of the parties hereto, in accordance with the Master Plan, for future Station development and facilities, such as laboratory buildings, dormitory for temporary personnel, museum and storage facilities, caretakers quarters, fish pens for research purposes, etc.; and

(b) Respect and recognize long-term ecological studies conducted by the Station by identifying in the Park Master Plan mutually acceptable study plots within the various aquatic and terrestrial ecosystems of the Park and Buck Island Reef National Monument; and

(c) Allow the Station reasonable use of Service dock facilities in the area of the Station; and

(d) Make available to the College, for on-site use, the reference materials contained in the Park library; or for off-site use at the discretion of the Superintendent; and

(e) Make existing Service structures available, on a reasonable rental basis, for use by the Station at the discretion of the Park Superintendent; and

(f) Make available to the College, at the discretion of the Superintendent, maintenance services and facilities including equipment, for purposes related to the operation of the Station, on a reasonable rental basis; and

(g) Provide for the normal collection of garbage and refuse in conjunction with such services as otherwise may be established in the general area of the Station; unless such garbage or refuse is of such nature or volume that requires undue hardship to the Park collection facilities or employees, in which case the Superintendent may impose a collection fee, at a rate commensurate with the additional services rendered.

Article III. It is further mutually agreed between the parties:

(a) Additional contracts between the Service and the College may be entered into under this agreement for natural sciences research and surveys that are pertinent to the management, protection, and/or interpretation of natural resources in Virgin Islands National Park, Buck Island Reef National Monument, and other Service-administered areas in the Virgin Islands area, or for such other studies as may be deemed desirable by both parties;

(b) In the studies, research, surveys and investigations carried on under this agreement the College is not restricted to the Park or other Service-administered areas, because the general purpose is to add to the knowledge concerning the natural resources of the Virgin Islands area;

(c) The College may invite, or contract (at no cost to the Service) with, individuals or institutions to carry on associated studies in disciplines other than the natural sciences, to further these studies, subject to the concurrence of the Service;

(d) All research proposed to be conducted upon lands or in waters administered by the Service must be approved by the Service, as outlined in the Service's Natural Sciences Research Handbook or subsequent guidelines, prior to the initiation of such activities;

(e) A Board or Committee shall be established by the College or Station to give broad direction on matters of research policy and orientation, and operating policy, for the Station. A representative of the Service shall be appointed by the Director of the National Park Service to membership on such Board or Committee;

(f) No member of or delegate to the Congress or resident commission shall be admitted to any share or part of this agreement or to any benefit that may arise herefrom;

(g) Nothing in this agreement shall be construed as obligating either party hereto in the expenditure of funds or for the future payment of money in excess of appropriations authorized by law;

(h) The United States does not by reason of entering into the agreement assume any liability for injury or damage to any person or property incident to or arising during or in consequence of the use, occupancy or enjoyment by the College of the premises or facilities used or administered by the College under the terms of this agreement;

(i) Nothing contained herein shall be construed as limiting or affecting in any way the authority of the Director, National Park Service, in connection with the administration and protection of the lands under the administration of the Service in accordance with the purpose for which it was acquired;

(j) The College and the Service will render reasonable mutual assistance in emergencies that may occur during the tenure of this agreement;

(k) Upon dissolution of the Station, specimens collected from within the Park and stored at the Station, will, at the option of the Service, become the property of the Park, unless the Station has received prior written notification allowing the removal of said specimens from the Park;

(l) The Station or the College (or the Government of the Virgin Islands, in the event of the dissolution of the Station) shall have the right to remove structures erected by the Station upon termination of use or upon termination of the agreement; provided that such structures are removed within two (2) years of such terminations, after which time the structure(s) will, at the option of the National Park Service, become the property of the U. S. Government; unless the removal of said structures is subject to a prior agreement; after the removal of such structures by the Station, the Station must assume the responsibility for restoring the site, as nearly as possible, to its pre-structure condition.

(m) The Service shall issue special use permits to the College for the use of the land for the Station and the College agrees to follow all of the terms and conditions of the use permits;

(n) This agreement shall become effective upon the date of approval by the parties hereto and shall remain in force for a period of twenty (20) years, except that it may be terminated prior to that time in the event that:

1) The College's need for the above-described Station for research purposes terminates prior to the elapse of twenty (20) years, or 2) provisions of this agreement are violated, or 3) the parties hereto mutually consent to termination;

(o) This agreement may be amended by the mutual agreement of the parties hereto and may be extended beyond the twenty (20) year period by the written agreement of the parties hereto.

IN WITNESS WHEREOF, the parties hereto have hereunto subscribed their names and affixed their seals this 1st day of November, 19 66.

THE UNITED STATES OF AMERICA

by /s/ Frank R. Givens

THE COLLEGE OF THE VIRGIN ISLANDS

by _____
(signature not legible)

Two Witnesses as to:
The College of the Virgin Islands

_____
(signature not legible)

_____
(signature not legible)

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

The College of the Virgin Islands
Virgin Islands Ecological Research Station

Memorandum of Agreement

Amendment Number 1

This Memorandum of Agreement dated November 1, 1966 is hereby amended due to the increased facilities in operation at the Virgin Islands Ecological Research Station located at Lameshur Bay, St. John, U.S. Virgin Islands.

Now, Therefore, in consideration of the mutual covenants hereinafter set forth, parties hereto agree to these amendments as follows:

Article I The College agrees to:

(g) Add at end of paragraph: collection permits, required for research, shall be issued by the Superintendent, National Park Service to individuals only and not for group collecting.

(l) Provide for the normal collection of garbage and refuse in the general area of the station. Disposal of garbage and refuse must be made outside of the boundaries of the Virgin Islands National Park.

Article II The Service agrees to:

(g) Delete paragraph for garbage collection by the National Park Service.

Article III It is further mutually agreed between the parties:

(m) Delete paragraph: A special use permit is not necessary and this memorandum of agreement is adequate for the purpose intended.

Except for these changes in this amendment all provisions in the basic Memorandum of Agreement dated November 1, 1966 shall remain in effect.

In witness whereof, the parties hereto have hereunto subscribed their names and affixed their seals this 10th day of February 1970.

The United States of America

by _____
(signature not legible)

The College of the Virgin Islands

by _____
(signature not legible)

Two Witnesses as to:
The College of the Virgin Islands

_____
(signature not legible)

_____
(signature not legible)

BILL No. 1562

FOURTH LEGISLATURE OF THE VIRGIN ISLANDS

OF THE UNITED STATES

Regular Session

1962

Act Accepting and Authorizing National Park Service Participation in the Building and Maintaining Public Roads in St. John, Virgin Islands.

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WHEREAS the lack of decent roadways has been and continues to be one of the major deterrents to the economic growth and development of the island of St. John; and

WHEREAS the National Park Service has informed the Governor of the Virgin Islands, by letter dated October 26, 1961, that it will improve and maintain the following public roads in St. John: (1) the North Shore Road from the park boundary at Cruz Bay to the intersection of said road with the Center Line Road at King Hill; (2) the spur road to Annaberg and Mary Point; (3) the Bordeaux Road; (4) the Lameshur Road from Park boundary to Lameshur; and (5) the East End Road from Park boundary at Coral Bay eastward to the East boundary of the Park and to cooperate fully to the end that all private properties have passable road access, wherever necessary, to the aforesaid public roads; and

WHEREAS the undertaking by the National Park Service to improve and maintain the roadways specified is hereby recognized as a substantial financial benefit to the government of the Virgin Islands; Now, therefore

BE IT ENACTED by the Legislature of the Virgin Islands:

SECTION 1. The Legislature of the Virgin Islands hereby accepts the offer of the National Park Service to improve and maintain the following named public roads in St. John: the North Shore, Annaberg and Mary Point, Bordeaux, Lameshur and East End Roads and the said National Park Service is hereby authorized to proceed to make improvements to said roads in accordance with the following conditions:

A. All road improvement plans initiated by the National Park Service shall be first submitted to the Commissioner of the Department of Public Works for approval before the particular road improvement project is commenced.

B. All road improvement plans for the North Shore and East End Roads shall, where the topography of the terrain permits, meet the minimum construction specifications as to materials, width of road, depth of roadbed, curbs, drains and culverts as set by the Department of Public Works or any applicable law existing at the commencement of any road improvement project.

SECTION 2. Nothing contained in this Act shall be construed as conveying title or any other proprietary interest in and to the aforesaid roadways to the National Park Service nor as transferring control and jurisdiction to the National Park Service.

The roads involved herein shall retain their character as public roads. The Government of the Virgin Islands retains title to said roads as well as its usual rights with respect to public thoroughfares, subject only to the rights herein conferred upon the National Park Service.

SECTION 3. The Commissioner of the Department of Public Works is hereby authorized, when called upon, to cooperate fully with the National Park Service in road design and planning and in such other ways as may be feasible, in order to facilitate any public road improvement project undertaken by the National Park Service pursuant to the authority contained herein.

SECTION 4. Should any provision of this Act be in conflict with any provision of any other presently existing law, the provisions of this Act shall take precedence during, but only during, such time as may be required for the improvement of the roads or parts of roads referred to in Section 1 of this Act.

SECTION 5. This Act shall become effective upon approval of the Governor of the Virgin Islands.

Thus passed by the Legislature of the Virgin Islands on January 10, 1962.

Witness our Hands and the Seal of the Legislature of the Virgin Islands this 10th Day of January, A. D., 1962.

/s/ WALTER I. M. HODGE
President

/s/ JOHN L. MADURO
Legislative Secretary

The above Bill is hereby sanctioned and approved.

Witness my hand and Seal of the Government of the Virgin Islands of the United States at Charlotte Amalie, St. Thomas

This 24 day of Jan. A.D., 1962

/s/ Ralph M. Paiewonsky
Governor

MANAGEMENT OBJECTIVES

VIRGIN ISLANDS NATIONAL PARK

Recommended by:

/s/ Harry O'Bryant — 7/29/71
Acting Superintendent — Date

Approved by:

(signature not legible) — 8/5/71
Acting Director, Southeast Region — Date

NEWSPAPER ARTICLE

Hodge's determination offers protection for St. John lands

ST. THOMAS (UPI) — The determination of Senator-at-large Cleone Creque Hodge led to unanimous legislative support for her bill, expressing the opinion of the people of St. John, that no further areas of that island should be added to the Virgin Islands National Park.

Hodge's bill, which passed 7-2-0 with one senator abstaining, requests, in a resolution to be sent to the National Park Service and appropriate federal agencies, that land acquired on St. John stop.

An amendment added by Hodge during debate, requests the National Park Service to review its present land use policies in order to restore some of the traditional land uses that are now restricted.

The senator pointed out that national park boundary restrictions have prohibited residents from harvesting bush tea, coconuts and traditional native vegetables.

Hodge also noted that while the taxpayers of St. John must bear the burden of the increased cost of road maintenance and other facilities that have been increasing because of the large number of visitors to the park, the large holdings of the park preclude further commercial development, thus eroding the property tax base.

The senator said the park's submerged land holdings have also severely restricted fishing and boating areas, thus curtailing the livelihood of natives.

Hodge also said that because of the large holdings of the park, property values on the island have escalated to the point where few native St. Johnians can afford to own their own home.

THE DAILY NEWS, ST. THOMAS, U.S. VIRGIN ISLANDS (MAY, 1979)

SITE SELECTION FOR A COMMUNITY AND CULTURAL CENTER ST. JOHN, U.S. VIRGIN ISLANDS

by

MARGUERITE L. EDISON

B.S.L.A., Iowa State University, 1972

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF LANDSCAPE ARCHITECTURE

Department of Landscape Architecture

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1979

ABSTRACT

In August, 1956 the U.S. Congress enacted legislation establishing the Virgin Islands National Park. The park encompasses two thirds of the island of St. John, the smallest of the three U.S. Virgin Islands. As with many national parks, it has attracted visitors from all parts of the world. While all who visit enjoy the clear blue waters of the Caribbean, the amiable climate, and beautiful scenery, the residents feel that the park occupies far too much area and severely limits the development and expansion of the community.

In May, 1979 two major developments took place. First, a bill expressing the public opinion that no further lands on St. John be added to the Virgin Islands National Park, was passed unanimously by the Virgin Islands Legislature. Secondly, a proposal was prepared by a St. John citizens group asking that a portion of the existing park land be provided for a community and cultural center. The proposal was sent to the Secretary of the Interior. These incidents and increasing public pressure prompted the National Park Service to take steps towards solving the site selection problem.

To accomplish this the N.P.S. provided a landscape architect (the author) to conduct an islandwide survey and analysis to produce site alternatives for the intended facility. A task directive was prepared and agreed upon by a group of individuals representing the community, the Virgin Islands Planning Office, and the Virgin Islands National Park. As outlined by the directive the study included research, analysis, and synthesis phases.

During the research phase, information related to St. John's social and cultural resources and natural resources was gathered. A cross section of individuals and groups supplied information related to community and park needs. This information was analyzed and subsequently used to form the program for development. After careful analysis of the natural resources, location of potential development zones was established. These zones represent areas on St. John with few natural limitations for development.

Synthesis of the program requirements and development zones resulted in establishment of four (4) site alternatives. These sites possess natural features and sizes suitable for development of the proposed community and cultural facilities.

At this point in the study all information was prepared and finalized for review by the National Park Service and the representatives of St. John. Collectively these two groups will determine the final site selection. This portion of the study does not contain any site reviews, evaluations, or recommendations.

In addition to the information provided to the National Park Service, further evaluation, and additional alternative, and recommendations have been prepared by the author. While these recommendations do not directly represent the views and policies of the National Park Service or the Community of St. John, they satisfy the program requirements.

In determining the alternatives and recommendations each interest group's priorities and critical island resources were re-evaluated and scenarios developed. After weighing the potential advantages and disadvantages final site and program recommendations were made.