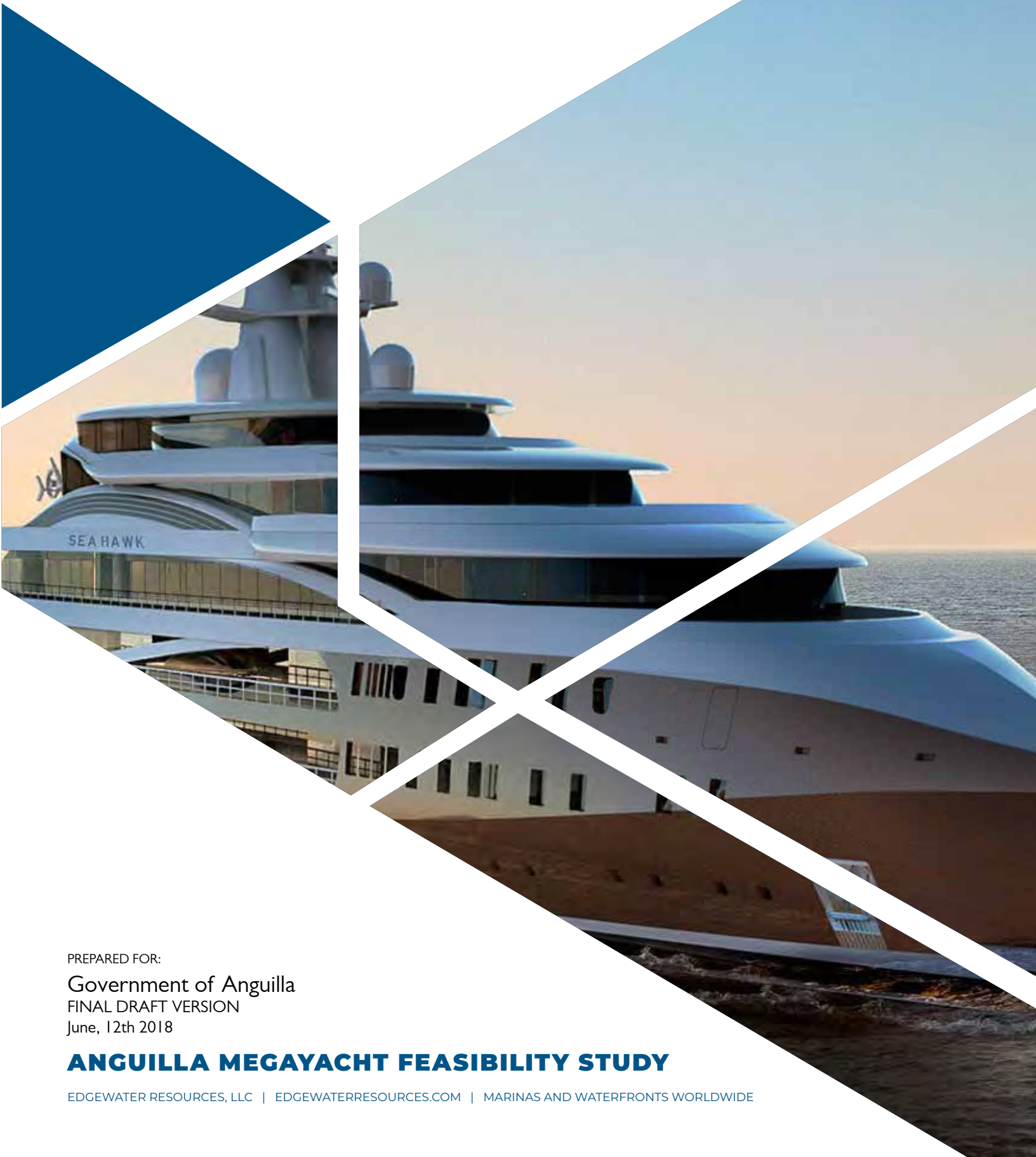




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Government of Anguilla

FINAL DRAFT VERSION

June, 12th 2018

ANGUILLA MEGAYACHT FEASIBILITY STUDY

EDGEWATER RESOURCES, LLC | EDGEWATERRESOURCES.COM | MARINAS AND WATERFRONTS WORLDWIDE

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I. EXECUTIVE SUMMARY

Anguilla has a rich maritime history of ship building, sailing, and racing, which has permeated the very character of the island. Yet the island doesn't have any yacht clubs or marinas to service these vessels or the numerous yachts that travel the Caribbean. The beauty, serenity, and exclusivity of Anguilla provides an ideal destination for high end vacationers. As such, it's about time that Anguilla launches itself as a major player in the megayacht industry, capable of servicing the clientele it aims to attract.

A market analysis was performed that showed the rising demand for world-class marinas located in the Caribbean to service the rising number of megayachts travelling this area. Anguilla is perfectly suited to provide a competitive advantage over other islands in the Caribbean due to its tax free status, proximity to deep waters, protected harbors, and on island amenities. In addition, Anguilla's largest market is in luxury tourism and the island has a large and expertly trained workforce in hospitality and construction.

The Government of Anguilla (GoA) commissioned a study to evaluate the island and identify suitable sites for development of megayacht marinas with upland amenities. The process of selecting potential sites for megayacht facilities included evaluating existing site conditions, such as geography, coastal processes, environmental concerns, property ownership, property availability (unencumbered by development agreements), existing infrastructure, proximity to amenities, and ability to augment tourism on the island. We initially viewed all island locations and through feasibility analysis, we've identified five potential sites for consideration in this study, including: Sandy Ground, Blowing Point, Rendezvous Bay, Little Harbour, and Scrub Island. Preliminary slip mixes, cost estimates and adjacent upland development opportunities were identified for each site and concept plans were developed for all the sites. Each site has potential for development with various pros and cons for each.



II. BOATING IN ANGUILLA

PAST, PRESENT & FUTURE



BOATING IN ANGUILLA

PAST, PRESENT & FUTURE



The Warspite, Anguilla's most famous ship

Since its occupation, Anguilla has been a place for boaters. The deeply rooted tradition spans back hundreds of years starting with the original seafaring inhabitants of the island, the Taino and Arawak people¹. These oceangoing people navigated the Caribbean establishing their roots on the island and sustaining themselves off the spoils of the surrounding waters. Maritime traditions changed as the island became a British colony and occupations such as fishing, shipbuilding, farming and international trading flourished.

After the American Revolution, trade with the United States stopped and was replaced by trade with large schooners from Nova Scotia, Canada. Anguilla was exposed to new ship building technologies and techniques, allowing them to expand their craftsmanship and designs. Later, as the spoils of farming dwindled due to persistent droughts and international trade declined, the resourceful people of Anguilla turned to traveling to other nations to conduct trade. As the sugar trade began booming in 1895, crews of workers would set off racing each other to their destinations and back to Anguilla at the end of the harvesting season^{2,3}. The journey could last up to 21 days so sailors often raced each other to cure boredom. Fishing ships were also built for speed, as refrigeration wasn't available



BOATING IN ANGUILLA PAST, PRESENT & FUTURE

and fisherman needed to head out, claim their catch, and return to sell it before it spoiled⁴. What started as a way to entertain the crew and pass time on the trip between islands turned into a national past time. Anguillians of all ages would gather at the shore to see the schooners race home. With this, a history of boat racing emerged and the golden age of Anguillian sailing began. Anguilla's most famous ship, The Warspite (1902) quickly sailed into the hearts of Anguillians as one of the fastest and most beautiful ships. Tales of boat races and captains became legends in Anguilla, still passed down through generations to this day.

Anguilla carried its rich history of boating into the 21st century. Anguilla's own Rebel Marine Ltd., whose motto is 'When love and skill come together, expect a masterpiece', have been building expertly crafted boats for the past 30 years. Founded by David Carty, Rebel Marine is an excellent example of Anguillian skill and craftsmanship. Historically, Rebel Marine's fast ferries have been dubbed 'marine limousines' for their sleek looks in conjunction with a smooth and quiet ride in open ocean conditions. Seafaring and boat-building is very much a part of the economy and cultural way of life in Anguilla. The face of Anguilla's maritime culture has changed several times throughout its history and is expected to adapt and change to meet the future demands and desires of the global boating market. While Anguilla has a rich history of sailing and racing, which has permeated the very character of the island, it does not yet host any yacht clubs or marinas. With Anguilla prizing itself as a destination for the high end vacationers, it's about time that the island launches itself as a major player in the megayacht industry capable of servicing the clientele it aims to attract.

Anguilla now hosts several annual regattas, or races, that stem from the earlier days of sailing off the island in search of work, fish, and economic opportunities. In fact the national sport of the island is boat racing, with major races taking place during public holidays and popularly attended by most the islanders and vacationers alike⁵.



The Rebel Marine crew hard at work building one of the boats Anguilla is so famous for.

III. MEGAYACHT MARINA MARKET



MEGAYACHT MARINA MARKET ANALYSIS

Although the island nation has been identified as an ideal destination for the highest caliber yachts, there are currently no megayacht marinas in Anguilla. The following analysis has been carefully developed to ensure that the lifestyle of Anguilla is enhanced by this new market and that the authenticity of Anguilla is preserved.



GOALS & OBJECTIVES

THE GOALS OF THE MARINA MARKET ANALYSIS (MARKET ANALYSIS) ARE TO:

Identify and quantify economic benefits to the Anguillian Gross Domestic Product (GDP) and fiscal benefits to the Government of Anguilla (GoA).

Identify the 'pull factors' that would attract yachting to Anguilla and provide recommendations on how to develop them. The object is to attract visitors and provide incentives for them to extend the duration of their stay and utilize existing and future hotel, resort, and tourism/

ecotourism attractions in Anguilla.

Determine the potential market to develop a marina associated with a boutique hotel, luxury residences, and commercial development.

Identify the potential to create a megayacht industry, not only to serve as a marina to tie up yachts, but also to provide other direct and indirect benefits to Anguilla, such as yachting jobs and related economic

activities. This Market Analysis presents recommendations for optimizing the slip mix at the conceptually designed megayacht marinas on Anguilla.

The study also identifies the revenue potential for various options including seasonal, transient, charters, long-term leases, sale of berths and yacht club memberships. This study includes research on marinas in the Caribbean, South Florida, and European market areas.





ANGUILLA AREA & **YACHTING MARKETS**

Anguilla is located in the eastern Caribbean and is the most northerly of the Leeward Islands. This English speaking nation is just 91 square (sq.) kilometers (35 sq. miles); 26 kilometers (16 miles) long and 5 kilometers (3 miles) wide at its widest point. The average temperature on the island is 27° Celsius (80°F).

Caribbean, Florida and Europe Marina Analysis

Conclusions to this research were compiled from an analysis of rates, demand, and amenities of popular megayacht destinations in Florida, the Caribbean, and Europe. These marinas were selected based on their comparative ability to accommodate megayachts for short and long-term stays, richness of amenities, and location.



MARINA MARKET RATES & DEMAND

RESEARCH SHOWS THAT MARINA BERTHING RATES ARE BASED ON A WIDE RANGE OF FACTORS INCLUDING:

DEMAND FOR MARINAS IS BASED ON THE FOLLOWING AMENITIES FOR BOTH SMALLER BOATS AND MEGAYACHTS:

MEGAYACHT MARINAS REQUIRE ADDITIONAL PORT ATTRIBUTES TO BE SUCCESSFUL, INCLUDING:

- Supply of Berths Compared to Demand
- Quality of Marina Facilities Overall
- Quality of Marina Facilities Relative to Competitors
- Amenities / Services Provided
- Proximity of Marina Relative to Market Served
- Deep Water / Direct Ocean Access
- Protected Harbour

- Amenities
- Ease of Access to Open Waters
- Quality of Marina / Docks
- Protection from Coastal Elements

- Deep Water, Safe Navigation, and No Fixed Bridges
- Protection from Major Storms
- Adequate Security Provided by the Host Country both in territorial waters and in port
- World-class Dock Systems
- World-class Ambiance Including Hotels and Restaurants
- Access to Medical Facilities for Crew and Guests
- Located Near an International Airport
- Efficient Customs and Immigration Process
- Reasonable Prices for Fuel, Dockage, Electricity, Water and Chandlery
- Reliable and Expert Yacht Repair, Maintenance and Re-fit
- Crew Lifestyle for Fitness, Entertainment, Housing and Transport



CARIBBEAN YACHT MIGRATION PATTERNS

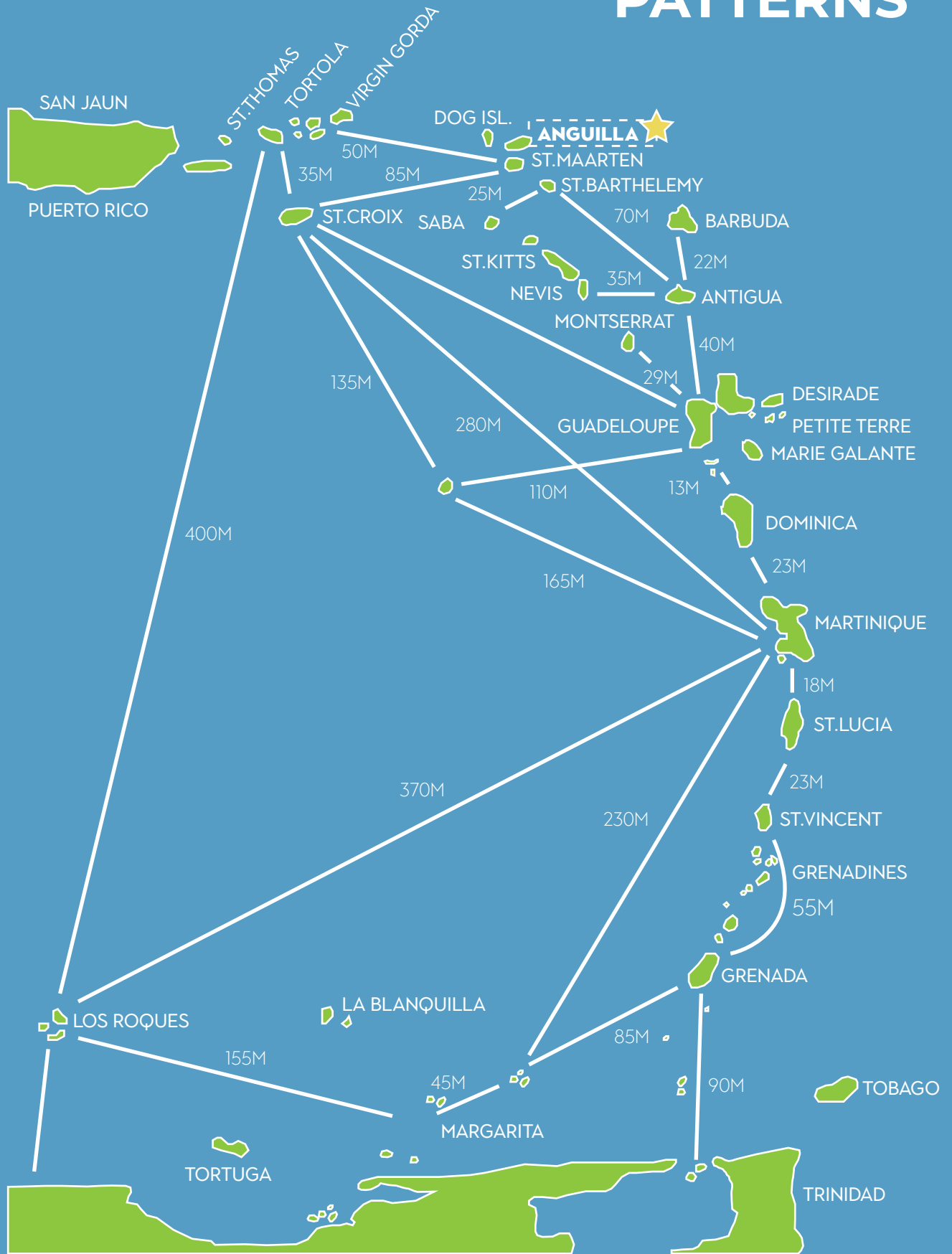


FIGURE B



BOATING MARKET SERVED

A STUDY CONDUCTED BY THE MARINE INDUSTRIES ASSOCIATION OF SOUTH FLORIDA FOUND THAT THE NUMBER OF MEGAYACHTS WORLDWIDE HAS INCREASED BY 53% OVER THE PAST 5 YEARS (BETWEEN 2013 AND 2018). EACH 120' (36.5M) MEGAYACHT SPENDS APPROXIMATELY \$2 MILLION ANNUALLY, PROVIDING A HUGE ECONOMIC IMPACT TO GOVERNMENTS THAT COLLECT TAXES AND THE FACILITIES THAT PROVIDE FOR THEM. LARGER YACHTS 300'+ (90+M) SPEND ON AVERAGE \$10 MILLION/YEAR AND UP TO \$50 MILLION/YEAR ON THE HIGHER 400' (122M) SIZE MEGAYACHTS.

AFTER STUDYING THE POTENTIAL YACHTING MARKET IN ANGUILLA, BASED ON A REVIEW OF CURRENT SUCCESSFUL MARINA TRENDS ON THE EASTERN SEABOARD OF THE UNITED STATES, THROUGHOUT THE CARIBBEAN, AND THROUGHOUT EUROPE, THE FOLLOWING MARKETS HAVE BEEN IDENTIFIED:

MEGAYACHTS (46+ METERS/150+ FEET)

The primary market will target megayachts as they travel from Europe to the Caribbean on their way to the United States. The northeasterly location of Anguilla within the Leeward Islands makes the island an attractive destination for yachts entering the Caribbean.

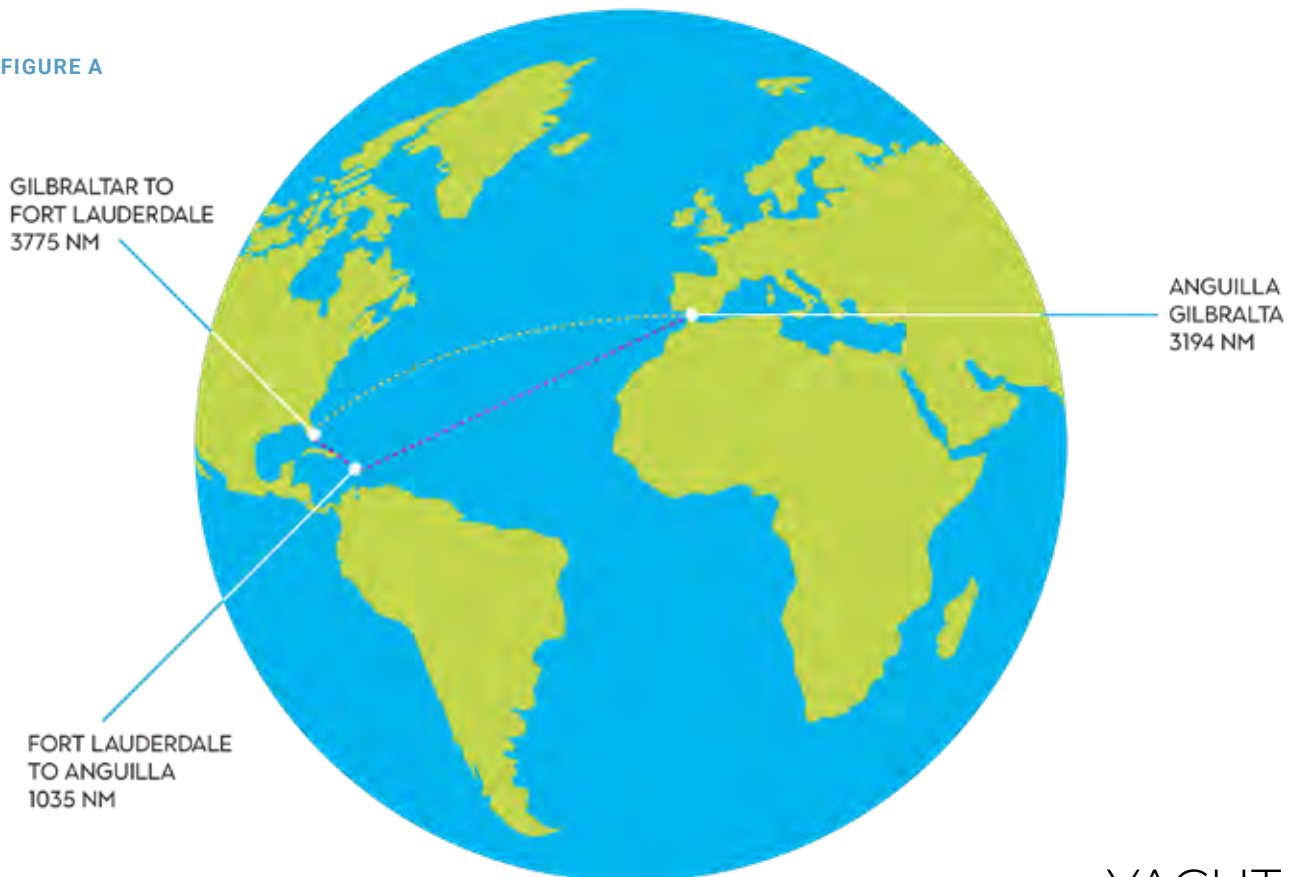
CARIBBEAN CHARTER YACHTS AND SAILBOATS

There are dozens of megayachts available for charter that reside in the Caribbean with weekly rental rates as high as \$1,000,000. Sailboat charters are also a viable target to attract new tourists to Anguilla.

LOCAL BOATERS IN ANGUILLA

The goal is to capture and expand the local boating market share by offering existing boat owners a safe, secure, full-service marina with state-of-the-art dockage, calm water, and five-star amenities.

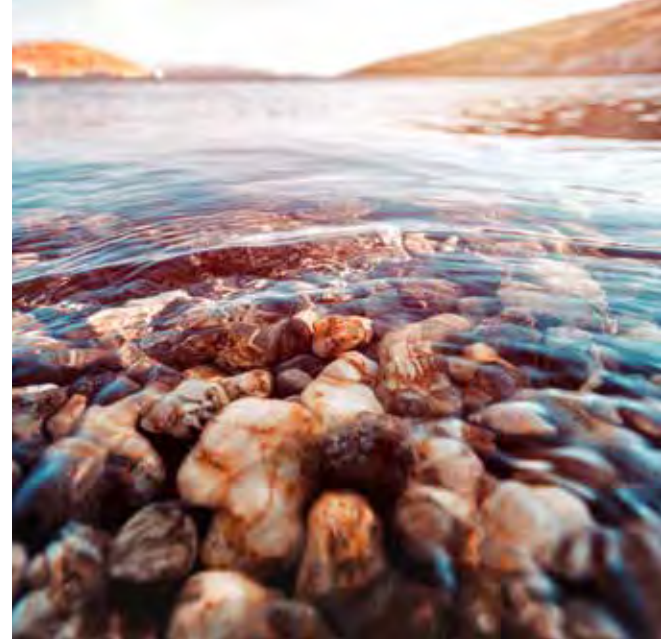
FIGURE A



YACHT MIGRATION PATTERNS

The map in Figure A depicts typical megayacht travel patterns in the Mediterranean. The general patterns of megayacht travel in the Caribbean is indicated in Figure B (to the left). These general travel patterns traverse nearly all of the Caribbean Islands.

IV. OVERALL SITE ANALYSIS & EVALUATIONS



OVERALL SITE ANALYSIS & EVALUATIONS

Edgewater Resources was commissioned by the GoA to evaluate the entire island in order to identify the most desirable sites for developing megayacht marina(s) and destination resort(s). The process of selecting potential sites for a megayacht marina facility was initiated by developing an understanding of the existing conditions observed throughout the island. Important components that make up the existing conditions include, from a high level assessment, geography of the Anguilla shoreline with attention to peninsulas, points, bays, coves, reefs, etc. that naturally create a calm sea environment. A large portion of the Anguilla shoreline remains exposed to extreme wind and wave energies due to the large fetch distances in several directions, which is why the selection of a site that provides natural shelter is highly important. Another component that served as a major draw in identifying potential sites was implementing the use of existing salt ponds that are found near the island's shoreline in several areas. Once these components were identified, property ownership information was evaluated to understand if land acquisition would be required or if existing government properties could be utilized. Bathymetric information is necessary to categorize sites and calculate the amount of necessary dredging required to create a navigable entrance channel and mooring basin for megayachts. To accompany bathymetric data, topographic information is necessary to understand existing grades of the surrounding land that may have potential to be developed. A cursory environmental assessment was performed to identify existing species of marine life, their associated habitats, and how the implementation of a marina facility could potentially impact the environmental aspects of each site. Consideration of existing infrastructure on the island is also key to identifying a site's viability based on where it is in relation to these existing features.



Potential suitable marina sites at Forest Bay (Conch Bay Group/ICA), Gull Pond (Shoal Bay West Properties/ Altamer), Cove Bay (Leeward Islands Resort Ltd. (now rebranded)) were not evaluated, as there are existing Memoranda of Agreement, concessions or similar arrangements with the GoA for the development or required studies of those sites. Additionally, the other outer islands such as Dog Island and Prickly Pear Cays were not evaluated, as they are located too far from the mainland. Anguilla has been in pursuit of attracting and procuring investments on the east end of the island Scrub Island, on the other hand, is considered to be within that geographic boundary, given its closer proximity to the mainland and that some development has already taken place including a small airstrip. Due to the close proximity to Anguilla, Scrub Island might serve to diversify Anguilla's tourism sector, should a developer choose to invest there. Further development of the out islands and cays can be exploited at a future stage in Anguilla development, given the distance away and the lack of infrastructure on those isolated undeveloped islands. These sites would be subject to separate evaluation and analysis and are therefore outside the remit of this feasibility study.

The sites considered in this feasibility study are unencumbered by active development projects and appear to be suitable to meet the goals and objectives presented by the GoA. Please refer to the matrix on the following page presenting the environmental, land use, and amenity parameters evaluated for the sites considered in this study.



SITE MATRIX PROS & CONS BY SITE

| Parameters | Sandy Ground | Blowing Point | Scrub Island | Rendezvous Bay | Little Harbor |
|--|--------------|---------------|--------------|----------------|---------------|
| ENVIRONMENTAL | | | | | |
| Bathymetric Suitability | X | | X | X | |
| Deep Water Approach | X | X | X | X | |
| Beach Erosion Concerns from Potential Project | | | | X | |
| Exposure to Winds | | X | X | | X |
| Protection from Winds | X | | | X | |
| Exposure to Waves | | X | X | | |
| Protection from Waves | X | | | X | X |
| Existing Ingress / Egress | X | | | X | |
| Existing Basin Flushing | | | | | X |
| Dense Seagrass (Native) | X | X | | | |
| Coral Reef/ Hardbottom Resources Present | X | X | X | | X |
| Wetlands Present | X | | X | X | |
| Important Bird Area | X | | X | X | |
| LAND USE | | | | | |
| Protected Anchorage for Vessels | X | | | X | X |
| Existing Vessel Use | X | X | | X | |
| Sufficient Land Area to Support Upland Facilities | X | | | | |
| Sufficient Water Area to Support Marina Facilities | X | | | | |
| ft) Megayachts | X | X | | X | |
| Excavation into Uplands Required | X | X | X | X | X |
| Dredging Required | X | X | X | X | X |
| Breakwater(s) Required | X | X | X | X | X |
| Proximity to Commercial Areas | X | | | | |
| Proximity to Residential Areas | X | | | | X |
| Compatible to Adjacent Land Uses | X | X | X | X | |
| Land Available for Development | X | | X | X | |
| Public/ Private Benefit | Private | Public | Private | Public | Public |
| Property Ownership (Easy vs Complex) | Easy | Complex | Easy | Complex | Complex |
| Isolated | | | X | | |
| AMENITIES | | | | | |
| Existing Upland Access via Roads | X | X | | X | X |
| Access to Utilities (Electric/Water/Trash) | X | X | | X | X |
| Customs & Immigration | X | X | | | |
| Near Existing Stores, Restaurants, Bars, etc | X | X | | X | |
| Close Proximity to Tourist Attractions | X | X | | X | |
| Beach in Walking Distance | X | X | X | X | X |
| Hiking Trails | X | | X | X | |
| Close Proximity to a Clinic/Hospital | X | | | | X |
| Close to Diving/Snorkeling Sites | | | X | | X |
| Taxi/Car/Bicycle for Hire | | X | | X | |
| Close to Water Taxi/Ferry | X | X | | X | |
| Cultural/Historical Area | X | | | X | X |
| Scenic Views | X | | X | X | |



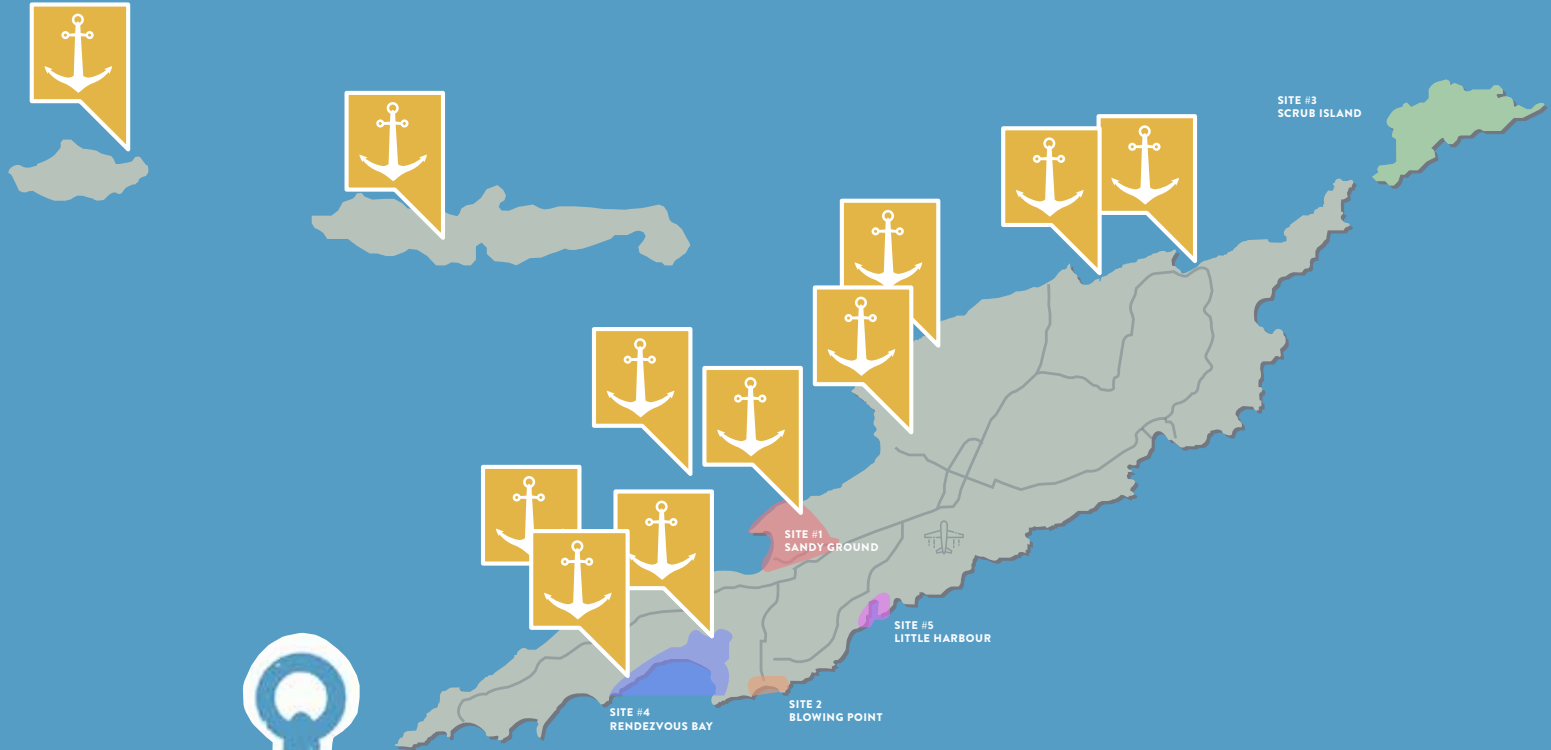


FIGURE E

ANGUILLA YACHTING MARKETS

IN SEARCHING FOR PLACES TO TAKE THEIR VESSELS, CAPTAINS OFTEN TURN TO THE INTERNET. A QUICK SEARCH FOR DOCKAGE IN ANGUILLA YIELDS THE FOLLOWING ELEVEN SWING MOORING OPPORTUNITIES⁷. THIS SEARCH INDICATES THAT THERE ARE NO OPPORTUNITIES FOR TRAVELING MEGAYACHTS TO COME TO PORT IN ANGUILLA. CLEARLY THERE IS A NEED IN THE MARKET FOR A MEGAYACHT FACILITY IN ANGUILLA.

PRICKLY PEAR CAYS, BETHEL

This anchorage has 10 moorings with a maximum draft of 10.6 meters (35 feet) and a maximum vessel length of 50 meters (164 feet).

RENDEZVOUS BAY LONG BAY VILLAGE

This anchorage has 20 moorings with a maximum draft of 15.2 meters (50 feet) and a maximum length of 50 meters (164 feet).

BARNES BAY AND MEADS BAY WEST END VILLAGE

This anchorage has 10 moorings with a maximum draft of 4.8 meters (16 feet) and a maximum length of 50 meters (164 feet).

LOWER SHOAL BAY, SHOAL BAY VILLA

This anchorage has 5 moorings with a maximum draft of 12.1 meters (40 feet) and a maximum length of 50 meters (164 feet).

SANDY ISLAND, BETHEL

This anchorage has 10 moorings with a maximum draft of 9.1 meters (30 feet) and a maximum length of 30 meters (98 feet).

DOG ISLAND, WEST END VILLAGE

This anchorage has 10 moorings with a maximum draft of 10.6 meters (35 feet) and a maximum vessel length of 50 meters (164 feet).

CROCUS BAY, EBENEZER

This anchorage has 20 moorings with a maximum draft of 10 meters (32 feet) and a maximum length of 50 meters (164 feet).

LOWER SHOAL BAY, SHOAL BAY VILLAGE

This anchorage has 5 moorings with a maximum draft of 5.7 meters (19 feet) and a maximum length of 50 meters (164 feet).

ISLAND HARBOUR, ISLAND HARBOUR

This anchorage has 5 moorings for vessels with a maximum draft of 10.6 meters (35 feet) and a maximum length of 50 meters (164 feet).

LITTLE BAY, EBENEZER

This anchorage has 7 moorings with a maximum draft of 4.5 meters (15 feet) and a maximum length of 50 meters (164 feet).

COVE BAY, LONG BAY VILLAGE

This anchorage has 10 moorings with a maximum draft of 3.35 meters (11 feet) and a maximum length of 50 meters (164 feet).



SITE SELECTION & CRITERIA

After careful review of the physical characteristics at numerous sites throughout the island, the following shortlist of potential Anguilla marina opportunities was identified:

- 1. SANDY GROUND
- 2. BLOWING POINT
- 3. SCRUB ISLAND
- 4. RENDEZVOUS BAY
- 5. LITTLE HARBOUR

THESE SITES WERE SELECTED FOR FURTHER REVIEW WHILE CONSIDERING THE FOLLOWING:



SAFETY

The ability to create a safe basin/harbour with enough area to support megayachts.



COASTAL DYNAMICS

Coastal considerations with respect to the impacts of ocean currents, surge, wind energy, wave energy, and their anticipated effects on a marina entrance channel.



LAND USE

Existing property ownership that is readily available with additional upland properties that can further support resort developments.



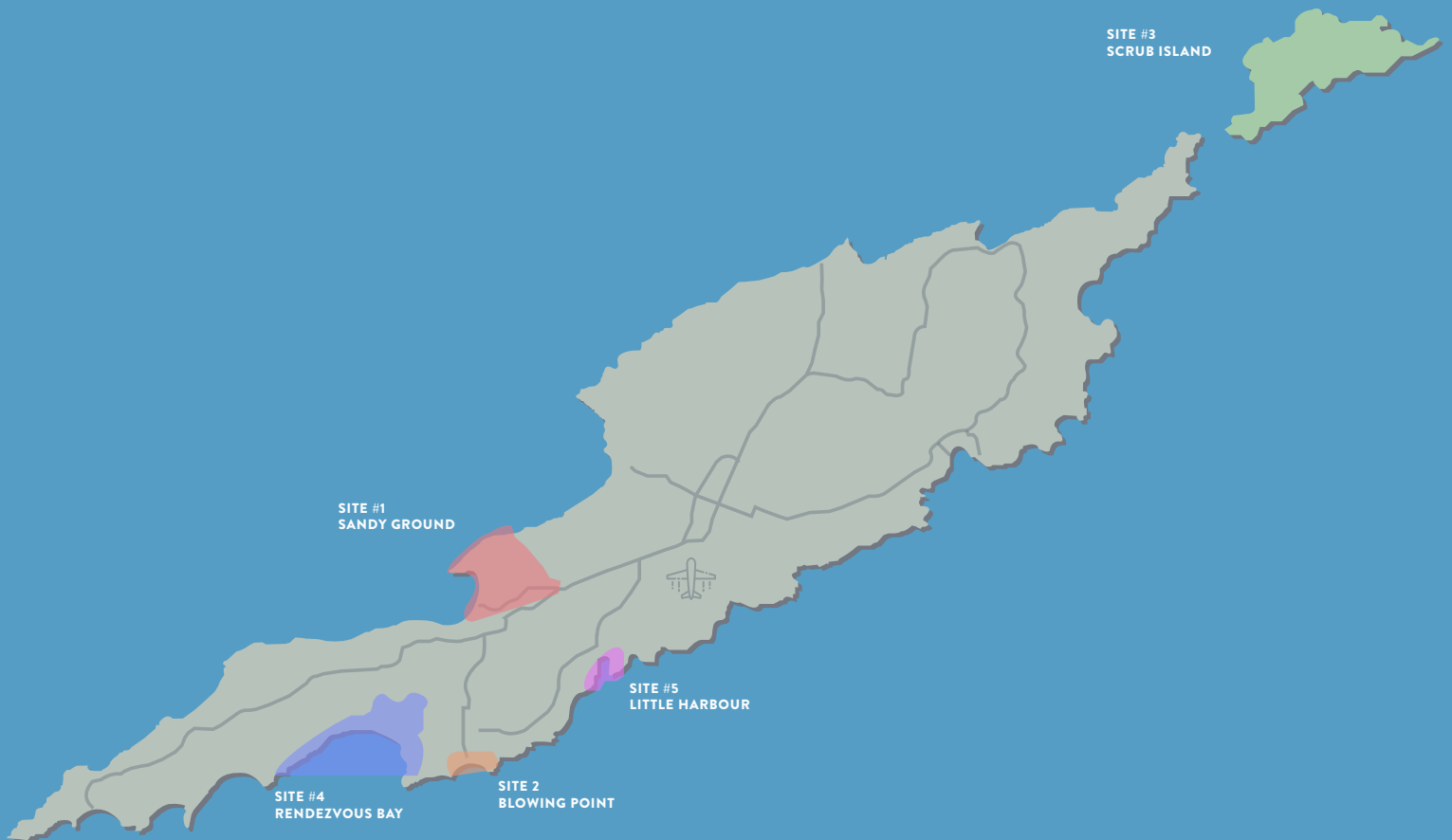
ENVIRONMENT

Potential environment impacts.



LOCATION

Proximity to amenities such as beaches, restaurants, retail developments (existing or future), and access to 5-star resorts with desirable amenities.



COASTAL **CONSIDERATIONS**



ANGUILLA COASTAL CONSIDERATIONS

A preliminary coastal dynamics assessment was performed to aid in the site selection for a megayacht marina on Anguilla. The main goal of this coastal assessment was to analyze the predominant wind and wave direction and associated magnitudes to help identify to most suitable site for a megayacht marina.

The United States Army Corps of Engineers (USACE) division of Wave Information Studies (WIS) has developed coastal wave hindcast models that are generated from available wind data. WIS uses proven discrete spectral wave models and input wind fields to produce wave characteristic estimates and directional spectral estimates. Through the WIS division, long-term wave estimates are available for all US Coastal waters. This extensive log of high quality data provides coastal climatology information that is commonly used in the planning, designing, maintenance, and monitoring of projects.

There are two WIS Stations in close proximity to Anguilla, which provided wind and wave data for this assessment. Atlantic WIS Station 62021 is approximately 136 kilometers (85 miles) northwest of Anguilla and Atlantic WIS Station 62022 is located approximately 104 kilometers (65 miles) west southwest of the island. Upon analyzing available hindcast data from 1984 – 2014, we confirmed that the predominant wind and wave direction is from the east. Although the WIS stations are not within nearshore proximity to Anguilla, data results report deep water wave heights that are applicable to the project area. The wind and wave roses from each WIS station are presented in Figures F through I. Wind and waves also travel from the west on occasion, but are much lower in magnitude and frequency.

The hindcast data shows that the maximum significant wave height for WIS Station 62021 was over 12 meters (nearly 40 feet) from the east-northeast during a September 1995 storm event. According the USACE WIS extremes return period analysis, the 1995 storm equivalent has a 2% probability of occurring on any given day of the year (50 year storm event). Data showed that a more common, 10% probability storm event, will generate deep water wave heights ranging between 4 and 5 meters (13 to 16 feet). It is important to note that the direction of every event categorized in the WIS extremes analysis is from the east-northeast direction. Based upon the monthly mean wave height values, the average wave height generally ranges from a 1 to 2 meter wave (3 to 6.5 feet) each month, with some months that reach average wave heights of 3 meters (nearly 10 feet). The maximum significant wave height for WIS Station 62022 was 11 meters (36 feet) from the easterly direction during a September 1989 storm, which was considered to be a 50 year storm event. Results of a more common, 10% probability storm at this station location, show a 4 meter (13 feet) average wave height. Data from WIS Station 62022 to the north of Anguilla indicate monthly average wave heights that are far more moderate with monthly average wave heights between 1 and 2 meters (3 to 6.5 feet) .

The ideal mooring climate for a megayacht marina has a maximum wave height of 0.30 meter (1 foot). The facility should be sited in a naturally sheltered location, with coastal structures implemented to dissipate wave energy as needed. As the predominant winds and waves affecting Anguilla approach from the east, sites openly exposed to the east are less desirable for marina development.

Extreme weather generally approaches from the northeast and southeast directions, with occasional , storms from the west. There is a significant amount of fetch to the west and southwest of Anguilla; therefore, wave dissipating structures will likely be required, even in a sheltered location. The need for coastal structures will be confirmed during a future phase through a wave study, once a site is selected. It is important to achieve a mooring environment with 0.3 meter (1 foot) wave heights or less to ensure protection of



ANGUILLA COASTAL CONSIDERATIONS

these expensive vessels and enjoyment of owners and crew. It is equally important to create a protected entrance channel to allow for safe and navigable ingress and egress.

Several sites around the island are adjacent to large bays, coves, and/or salt ponds that could accommodate a megayacht marina. Although several of these sites are naturally sheltered, conceptual design plans suggest entrance breakwaters to create a safe and navigable entrance channel, protect the adjacent shoreline, reduce the need for future maintenance dredging, and act as a wave break to dissipate wave energy entering the marina basin. The entrance channel locations for each site considered wind and wave energies, estimated water depths, and existing environmentally sensitive areas. Tidal fluctuations are minimal, averaging approximately 0.3 meter (1 foot); however, storm surge periodically impacts the island and sea level rise must be considered for the design life of the structures.

The conceptual designs presented herein include the excavation of an adjacent salt pond to be used for a marina basin. Geotechnical investigations will be required to confirm substrate characteristics. This information will be utilized to refine cost estimates, particularly with respect to dredging, sediment disposal options, and structural design constraints. The following site evaluations and associated conceptual designs are based on our extensive marina design experience, site visits, and desktop research. Future phases of work should include site specific evaluations including field data collection for wind and waves, bathymetric and topographic evaluations, and environmental assessments.



COASTAL CONSIDERATIONS [FIGURES F:I]

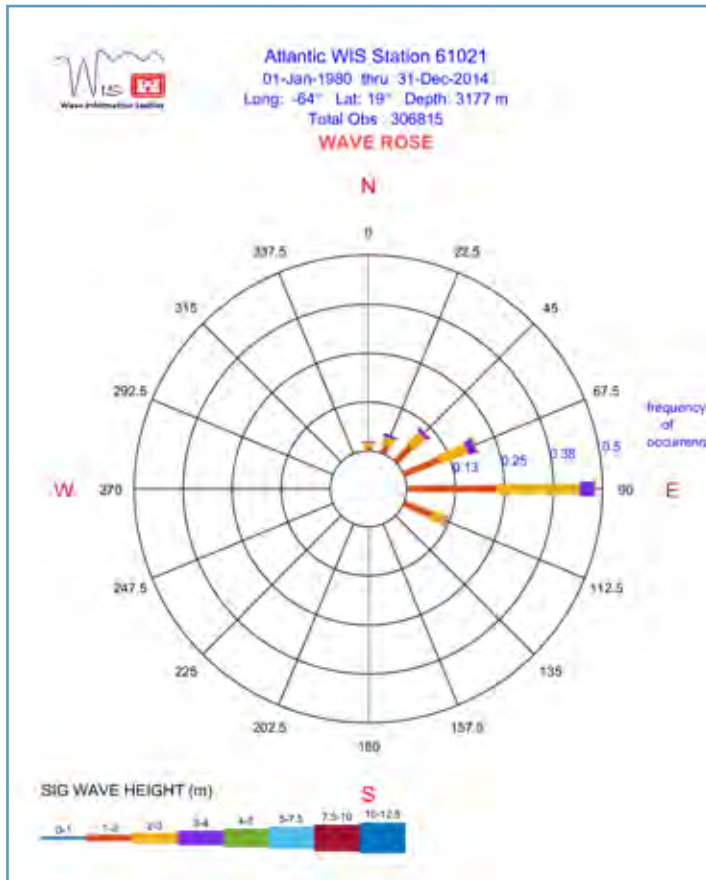


FIGURE F: STATION 61021 LAT:19, LONG:-64 WAVE ROSE

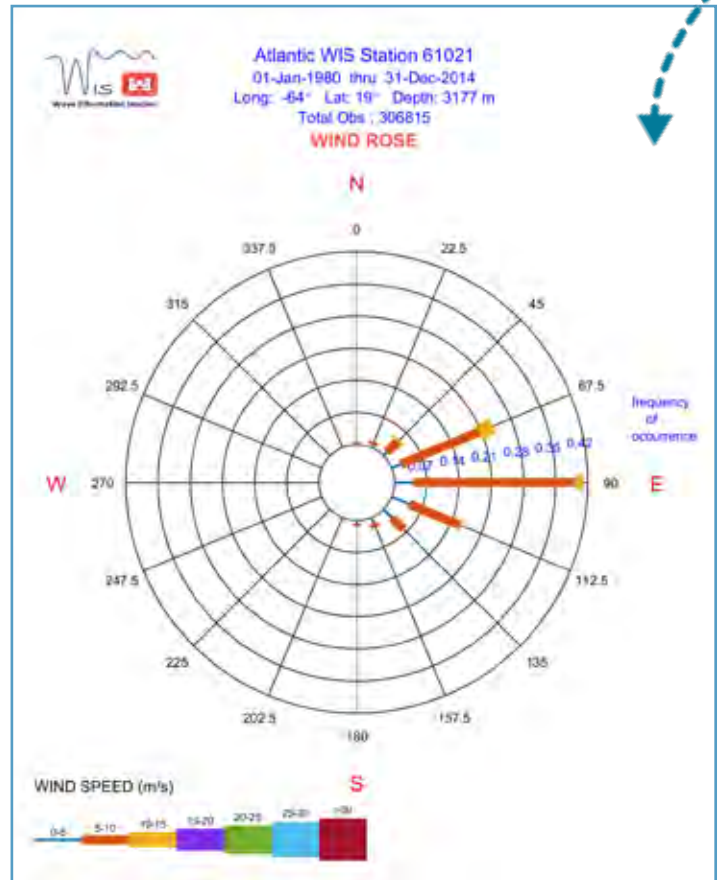


FIGURE G: STATION 61021 LAT:19, LONG:-64 WIND ROSE

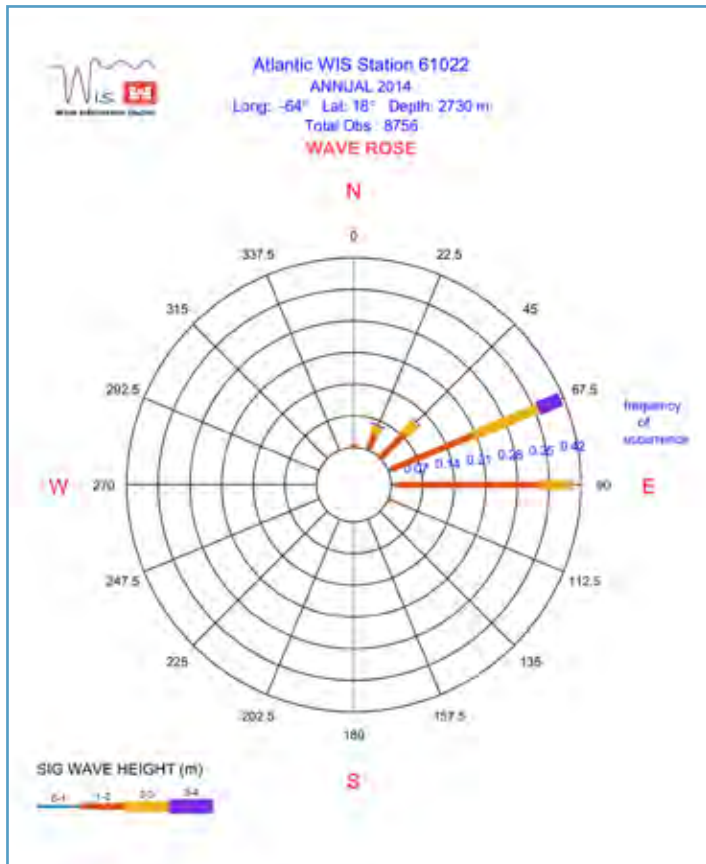


FIGURE H: STATION 61022 LAT:18, LONG:-64 WAVE ROSE

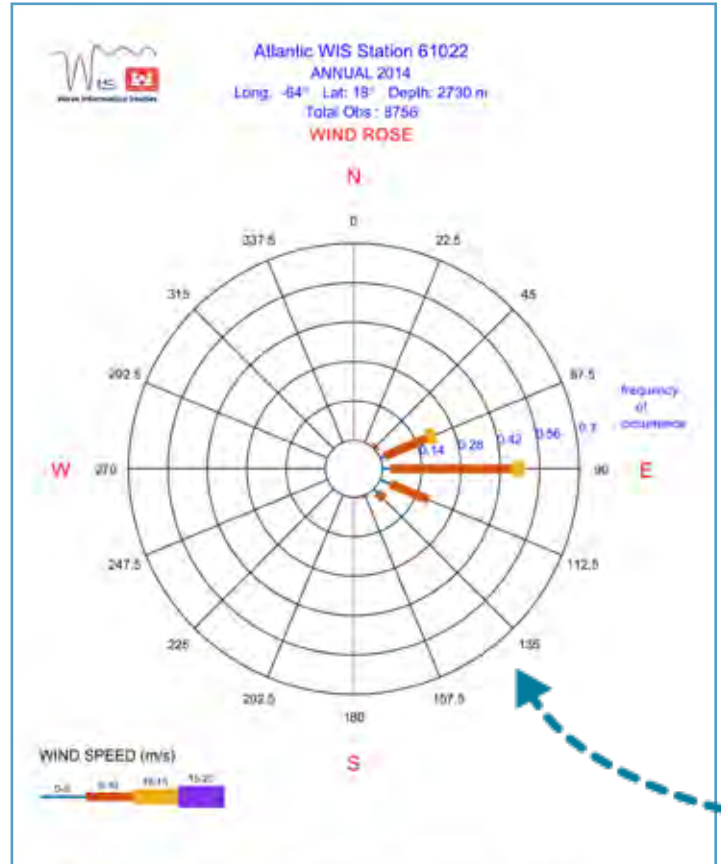


FIGURE I: STATION 61022 LAT:18, LONG:-64 WIND ROSE





ATLANTIC
OCEAN

61021

61022

ANGUILLA

*ANGUILLA*WAVE
INFORMATION STUDIES SITE MAP

ANGUILLA

COASTAL CONSIDERATIONS

SANDY GROUND

Sandy Ground is a naturally sheltered west facing shoreline that looks over Road Bay. The sites greatest exposure is directly from the west-northwest direction, which is favorable considering the findings of the wind and wave analysis. A cliff at the north end of the bay extends approximately 305 meters (1,000 feet) westward from the innermost location along the shoreline, and provides shelter from wind and waves from the greater northerly direction. The beach extends south and west from the cliff for approximately 762 meters (2,500 feet) until reaching the commercial shipping pier and continues westward for roughly 549 meters (1,800 feet) before arriving at a large bluff. There does not appear to be significant sand movement along the shoreline from the cliff at the northern extent, south to the commercial pier. However, the beach is narrower immediately south of the pier, which is likely serving as a permeable groin.

Much of the basin appears relatively protected by fringing reefs. A majority of the land surrounding Road Bay is steep terrain that reaches elevations of 53 meters (175 feet) above sea level, providing shelter from winds. A large salt pond is located east of the existing beach at Sandy Ground. The conceptual design for this site proposes to excavate the salt pond to accommodate the megayacht mooring basin. The proposed entrance channel and breakwaters are located at the northern end the bay, adjacent to an existing drainage canal. This location appears to be sheltered from predominant wind and wave energy.

To encourage flushing and protect water quality within the basin, a large culvert is proposed on the south end of the basin, exiting in the vicinity of the commercial shipping pier. Due to the low elevations that exist on the land between the salt pond and the bay, this area is considered vulnerable to sea level rise; however, the remainder of surrounding land is at substantially higher elevations. The existing bathymetry within Road Bay appears adequate for vessel navigation. It appears that vessels up to 91 meters (300 feet) can safely access the commercial pier. However, dredging would be required to establish an entrance channel, as well as adequate depths for mooring within the proposed marina basin .

BLOWING POINT

The bay at Blowing Point faces south-southwest protected by two reefs that extend from either end to create a natural oval shaped basin. This is the site where the existing fixed pier ferry terminal docks are located. After construction of the third pier, sometime between 2005 and 2011, the shoreline east of the new pier began to retreat. The piers are likely acting as semi-permeable groins and interrupting the longshore sediment transport from west to east. As a result, the beach east of the new pier is being starved of sediment. It appears that a riprap revetment was constructed to protect the southeast side of the upland property at the ferry terminal, while the immediately adjacent shoreline retreated. The east end of the sandy shoreline appears protected by a natural reef formation that is acting like a terminal groin and holding the sand within the limits of the Blowing Point basin. While some variability in shoreline position is evident on available Google Earth aerial imagery; overall, the shoreline appears relatively stable. The west end of the shoreline is protected by a natural reef immediately offshore that appears to be acting as a submerged breakwater. In response to this offshore formation, the beach is forming a tombolo. This is essentially anchoring the west end of the sandy shoreline. Additionally, there are fringing reefs immediately offshore that are protecting the shoreline in this area. These fringing reefs essentially “trip” the waves coming in from offshore, thereby reducing impacts to the shoreline. As a result, the basin is relatively calm, which is evidenced by the vessels anchored within it. A break in the reef allows for navigable ingress and egress of ferry boats.

The primary marine exposure for Blowing Point ranges from southeast to southwest. The uplands at Blowing Point are relatively low; however, they still offer some shelter from wind and waves out of the north. The island of St. Maarten is approximately 8 kilometers (5 miles) south of Blowing Point and provides some protection against wind and waves traveling from this direction. Predominant wind and wave approach this site from the east. Although the site appears to be a fairly calm basin, with an active ferry terminal and mooring of local vessels, our conceptual designs incorporate a protective breakwater that would also be used for mooring of vessels.



Smaller vessels would moor in an inner basin excavated from the adjacent salt pond. Further coastal analysis is necessary to refine the level of protection that would need to be provided by the protective breakwater surrounding the outer basin. Existing depths appear to be adequate near the entrance of the Bay; however, dredging would be required to accommodate megayachts in the outer basin, as well as to create a marina basin within the existing salt pond.

SCRUB ISLAND

Scrub Island is located roughly 5.6 kilometers (3.5 miles) from Island Harbour, off the northeastern point of mainland Anguilla. The island's coastline is primarily made up of rock outcroppings, with the exception of a few pocket beaches and a sheltered cove area. On the island's western facing shore is a beach that is protected by a large cliff to the south; however, this area has minimal protection from wind and wave energy from the north. The cove area on the island's eastern end is surrounded by a sandy beach with a small, unnavigable inlet, that allows the circulation of water through tidal cycles. A small beach is present on the island's southern coast, which remains exposed to storm energy from the east.

Due to the island's exposure to wind and wave action, the western facing coast has been selected as the preferred location for a marina facility. The selected western beach site remains exposed to wind and wave energy from the north, which will require mitigation at the entrance channel location. The conceptual design for Scrub Island utilizes the salt pond on the west end of the island as the proposed mooring basin, with an entrance channel that meanders from the southern end of the beach, north towards the salt pond. It will be necessary to dissipate wave energy at the mouth of the entrance channel to create a safe and navigable entrance channel. Wave energy is focused on the north end of the beach and as a result, the northern half of the shoreline is very narrow. A sand channel is present towards the center of the shoreline between higher relief reefs. From the sand channel towards the south, the beach is somewhat wider. The beach was observed to be very steep with a significant plateau elevation that is considered to be resilient against sea level rise. This beach is known for an abrupt drop off in bathymetry close to shore, providing favorable depths for the approach to the entrance channel.

Another location on the southern side of Scrub Island has been explored as a potential marina site and is depicted on the conceptual design plan. Two substantial breakwaters are depicted on the conceptual design to dissipate wave energy and create a calm basin for mooring in this location due to the open exposure that exists to the south and southeast. Existing depths at this site appear to be adequate for navigation; however, they may render the required breakwaters cost prohibitive.



ANGUILLA

COASTAL CONSIDERATIONS

RENDEZVOUS BAY

Rendezvous Bay is surrounded by a southwesterly facing beach and separated from a salt pond by a small spit of land. The beach shoreline travels southwest from the bay, where a large cape extends further, providing shelter from westerly storm events. A smaller headland feature extends south from the eastern end of Rendezvous Bay that separates the bay from Blowing Point and provides shelter from incoming eastern wind and wave energy. The island of St. Maarten is approximately 8 kilometers (5 miles) south of Rendezvous Bay and dissipates storm energy approaching from the south. With the natural protection that is provided by the formations surrounding Rendezvous Bay, the site offers desirable features for a megayacht marina. Coastal evaluations have led conceptual designs to include the use of two jetties to create a safe entrance channel. Elevations adjacent to the project site appear low and therefore vulnerable to sea level rise. The basin does not appear to be protected by nearshore fringing reefs and as a result, unimpeded waves are evident in several historical aerials entering the basin from the southeast and continuing towards the shoreline. The observed existing depths at Rendezvous Bay are navigable within close proximity to the shoreline; however, it is estimated that dredging will be necessary to construct an adequate entrance channel.

LITTLE HARBOUR

Little Harbour is appropriately named, as the shoreline rock outcropping and submerged reef creates a cove area along the southern coast of Anguilla. The shoreline at this location faces southeast and is accompanied by an outer reef that is approximately 183 to 366 meters (600 to 1200 feet) offshore. These structures consist of coral rubble and appear to be manmade. The reef connects to land at the northern end of this natural wave break, where a natural harbour area exists to the northwest. There is one breach in the structure, which does allow wave energy to enter the channel leading into Little Harbour. Similarly, wave energy enters the channel at the mouth on the south end. Despite the waves traversing the channel in these two locations, the inner basin is well protected and calm. Features of the surrounding land and nearly 427 meter (1,400 feet) reef break make for a suitable marine climate for a megayacht facility. Predominant wind and wave energies from the east and southeast are the greatest threat to a marina in Little Harbour, although the existing reef mitigates incoming swells.

Conceptual designs suggest the natural harbour area to be used as the primary mooring basin with an additional inner basin to the northeast within an existing salt pond. The salt pond appears to be breached and therefore, tidally flushed. A natural channel lies within the fairway between the shoreline and reef line, which requires modification to accommodate megayacht vessels. Observed existing depths are not adequate for megayacht drafts and therefore, dredging would be necessary to create a functional entrance channel. Sea level rise and storm surge would reduce the effectiveness of the existing wave break at the site.



ENVIRONMENTAL CONSIDERATIONS





MARINE PARK SYSTEM & MARINE PROTECTED AREAS

Seven marine parks have been established in Anguilla, five of which are a part of the Marine Park System. The Marine Park System includes the two heritage sites Sombrero Island and Junks Hole, as well as, the five Marine Protected Areas located at Dog Island, Prickly Pear Islands, Little Bay, Shoal Bay/Island Harbour, and Sandy Island. An eighth area, not officially legislated as a marine park, is in Rendezvous Bay, which is an important seagrass area and has been listed, but not enforced, as a no anchoring area in the Cruising Permits Act .

Anguilla has established five Marine Protected Areas (MPA) in order to protect its sensitive marine environment through the

management of visiting tourists, coastal development, and extractive fishing practices. Anchoring is restricted in the five MPAs (Dog Island, Prickly Pear Islands, Little Bay, Shoal Bay/Island Harbour, and Sandy Island) in an effort to reduce impacts to marine resources. Anchoring may occur only during daylight hours and in sandy areas. Otherwise vessels must use the provided buoys and pay the Marine Park Mooring Permit day fee. Mooring buoys have been installed within these five parks to protect the sensitive coral reefs and seagrass beds from anchoring. The buoys are color coded, with red buoys to be utilized by Anguillian Licensed dive operators only, yellow buoys to be used by vessels under 12 meters (40 feet) and white buoys

are for use by other boats, under 17 meters (55 feet) in length⁹. The coral reefs and seagrass beds provide for the livelihood of many Anguillians through fishing and tourism, while protecting the island from storms, stabilizing nearshore sediments, and producing beach sand. The Ministry of Home Affairs oversees the MPAs with the Department of Fisheries and Marine Resources (DFMR) managing the areas through surveillance, enforcement, and buoy maintenance¹⁰. The five locations selected as potential sites for a megayacht marina are not located within the boundaries of the five MPAs (See Figure D)¹

¹ Any proposed development should be consistent with the [Anguilla National Environmental Management Strategy and Action Plan 2005-2009](#).



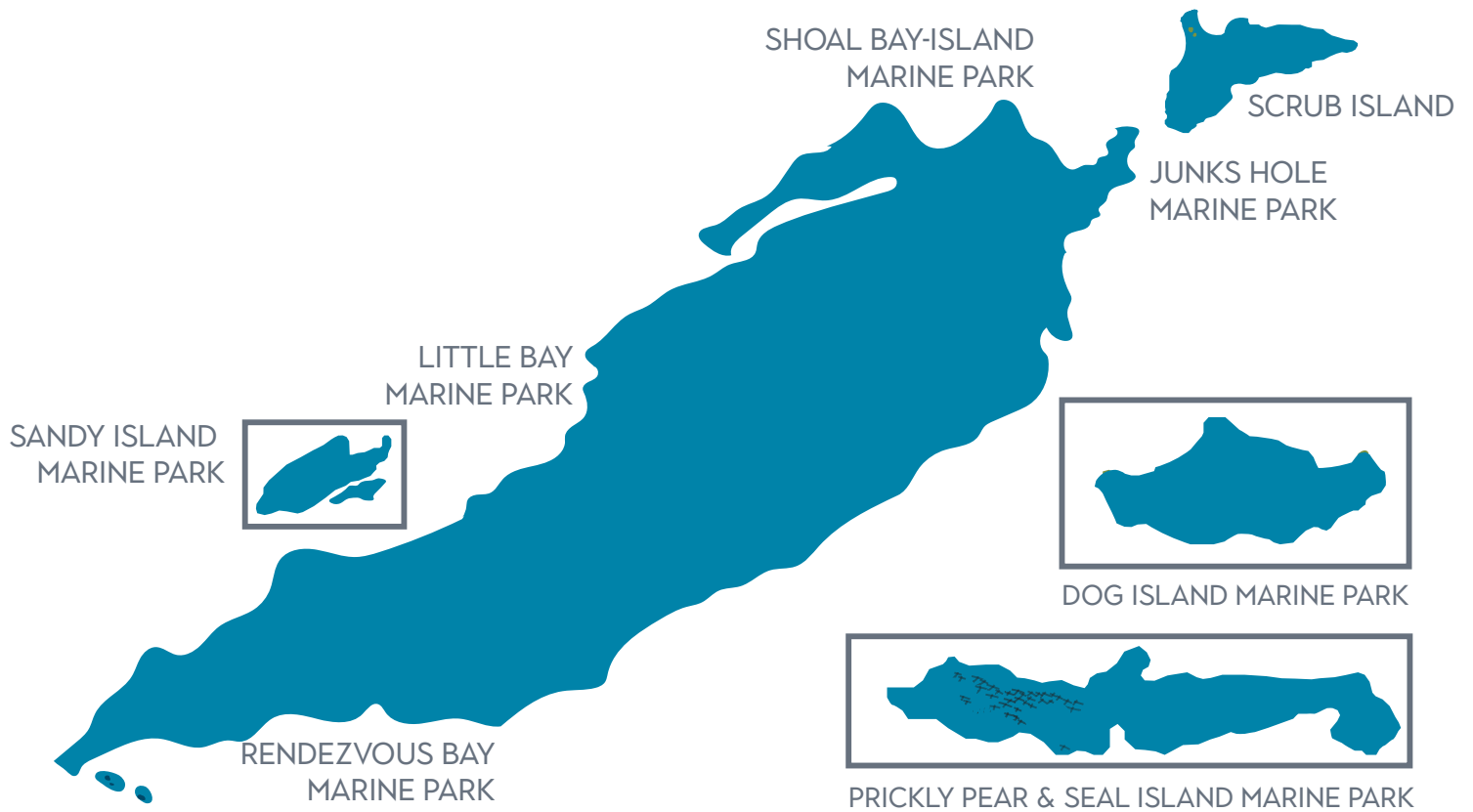


FIGURE D

MAP OF ANGUILLA ILLUSTRATING LOCATIONS OF MARINE PARKS, INCLUDING RENDEZVOUS BAY AND SHALLOW WATER AREAS. THE SHALLOW AREAS ARE PROPOSED TO BECOME THE COASTAL ZONE FISHERY MANAGEMENT AREA, A BUFFER ZONE AND LINK BETWEEN THE MARINE PARKS AND SURROUNDING COASTAL REGIONS WHERE SURVEILLANCE EFFORTS WILL BE CONCENTRATED. THE ENTIRE AREA DEPICTED ON THE MAP, EXCLUDING THAT WHICH BELONGS TO FRENCH ST. MARTIN WILL BECOME THE ANGUILLA MARINE MANAGEMENT AREA. FUTURE ENHANCED SURVEILLANCE WILL FOCUS ON THIS AREA SHOULD RESOURCES ALLOW.

ANGUILLA

ENVIRONMENTAL CONSIDERATIONS

SANDY GROUND/ROAD BAY

Sandy ground is the site of an existing shipping terminal with haphazard mooring throughout the basin. The majority of the basin is colonized by turtle grass (*Thalassia testudinum*) and the exotic invasive seagrass species Mediterranean seagrass (*Halophila stipulacea*; Photo 1). The sediments varied from sandy to silty within the basin and seagrass density varied throughout the basin.

In the north end of the basin, there is a large ballast pile, supporting a diverse ecological habitat. The ballast stones were generally 30.5 centimeters (1foot) in diameter. Stones on the periphery of the pile were buried in sand and supported little to no benthic growth or habitat (Photo 2). The majority of the ballast pile supported a variety of tropical fish, Scleractinian (stony) corals, macroalgae, and invertebrates (Photos 3 and 4). The larger corals were generally growing on the northeastern portion of the ballast pile and very little coral stress was observed. The landward edge of the ballast pile provided the most relief and supported the highest numbers of fish. Fish species observed include grunt (Family – Haemulidae), snapper (Family – Lutjanidae), parrotfish (Family – Scaridae), sheepshead (*Archosargus probatocephalus*), lookdown (*Selene vomer*), French angelfish (*Pomacanthus paru*), and ballyhoo (*Hemirampus brasiliensis*). Corals included starlet corals (*Siderastrea* sp.), finger corals (*Porites porities*), and elliptical star coral (*Dichocoenia stokesii*). Macroalgae species included brown algae (*Phaeophyceae*) *Padina* sp., and green algae (*Chlorophyta*) *Caulerpa* sp., and *Halimeda* sp. Invertebrates observed included rock boring urchins (*Echinometra lucunter*), octopus (*Octopodidae*), decorator crab (Family – *Majoidea*), and a spotted eagle ray (*Aetobatus narinari*). Sea turtles (Family – *Cheloniidae*) were also observed within the basin.



PHOTO 1: TURTLE & MEDITERRANEAN SEAGRASS



PHOTO 2: EDGE OF BALLAST PILE



PHOTO 3: BALLAST PILE HABITAT



PHOTO 4: BALLAST PILE HABITAT



BLOWING POINT

Blowing Point is the site of an existing ferry terminal and haphazard mooring of vessels. Much of the site is densely vegetated by turtle grass and manatee grass (Photo 5). Sediments were finer grained at this site and visibility was poor. The basin was relatively choppy with strong currents observed during the assessment. Large deep propeller scars were observed throughout the seagrass bed, with scars too deep for seagrass to naturally recover (Photo 6). Occasional large boulders were observed; however, they supported very little benthic growth.

In the vicinity of the proposed entrance channel that would lead to the proposed basin in the salt pond, 90% cover of turtle grass and manatee grass was observed. Several large blowholes were observed in this area. The area between the blowholes supported shoal grass (*Halodule wrightii*) with sprigs of manatee grass. Landward of the seagrass beds, and within the blowholes and prop scars, a thick layer of detritus was observed.

There is a natural, emergent, rock groin formation extending west from the east end of the basin, acting as a natural terminal groin (Photo 7). It appears that this structure provides protection to the eastern section of shoreline and a reduction in wave energy entering the eastern part of the basin. This structure provides habitat for a variety of tropical fish and was primarily colonized by calcareous algae and rock boring urchins. Seagrass beds inside of this formation consisted of turtle grass and manatee grass, at densities approaching 100% coverage. A few small starlet stony corals (*Siderastrea* sp.) were observed, less than 8 centimeters (3 inches) in diameter. Additionally, green macroalgae (*Chlorophyta*) was observed including *Penicillus* sp., *Caulerpa* sp., and *Halimeda* sp. with the invertebrate chitons (Class - Polyplacophora) on the intertidal portions of the structure.

The waterward face of this rock formation provided approximately 1 meter (3 feet) of relief with a few starlet stony corals, less than 5 centimeters (2 inches) in diameter. The substrate in this area was hardbottom supporting numerous rock boring urchins (Photo 8). Turtle grass was growing in pockets in the hardbottom that were filled with sand. Hardbottom relief and rugosity decreased towards the western edge of this rock formation.

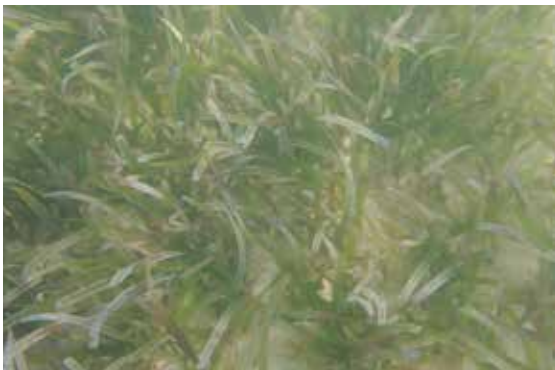


PHOTO 5: TURTLE & MANATEE GRASS BED



PHOTO 6: PROPELLER SCAR IN SEAGRASS BED



PHOTO 7: ROCK FORMATION ACTING AS TERMINAL GROIN



PHOTO 8: TYPICAL HARDBOTTOM SOUTHEAST BASIN

ANGUILLA

ENVIRONMENTAL CONSIDERATIONS

SCRUB ISLAND (WEST SHORELINE)

The western shoreline of Scrub Island is characterized by a steeply sloping shoreline with substantial relic coral features and relief (Photo 9). Strong surges were evident in the area, as was damage from past storms. Large rock structures, measuring on average 1.8 meters (6 feet) tall and 1.8 meters (6 feet) in diameter, were present on the northern third of the submerged area. Stony corals were colonizing the rocky substrate, inclusive of symmetrical brain coral (*Diploria strigosa*), elkhorn coral (*Acropora palmata*), and mustard hill coral (*Porites astreoides*) (Photos 10 and 11). The center third of the shoreline was barren sand under laid by rock substrate. The southern third of the shoreline was rocky with 0.6 meter (2 feet) to 1.2 meters (4 feet) of relief. The southern third of the shoreline supported a variety of fish including eyed flounder (*Bothus ocellatus*), balloonfish (*Diodon holocanthus*), and doctorfish (*Acanthurus chirurgus*) (Photo 12). Also common were fire corals (*Millipora complanata*) and white encrusting zoanthids (*Palythoa carbaeorum*). If construction were to occur in this area, it is recommended that stony corals suitable for transplantation (healthy corals >5 cm) be relocated to an adjacent suitable substrate.



SCRUB ISLAND SHORELINE PHOTOGRAPHED BY EDGEWATER TEAM



PHOTO 9: RELIC REEF FORMATION



PHOTO 10: ELKHORN CORAL (*ACROPORA PALMATA*)



PHOTO 11: SYMMETRICAL BRAIN CORAL (*DIPLORIA STRIGOSA*)



PHOTO 12: BALLOONFISH (*DIODON HOLOCANTHUS*)



RENDEZVOUS BAY

The substrate within Rendezvous Bay was predominantly sand (Photo 13). Closer to shore there was rock substrate emerging through the sand with 1 meter (3.3 feet) of relief in some areas (Photos 14 and 15). Occasional starlet stony corals were observed on the emergent substrate, less than 5 centimeters (2 inches) in diameter. Further from shore, in approximately 3 meters (10 feet) of water, a seagrass bed was observed (Photo 16). The bed was dominated by turtle grass and manatee grass with green macroalgae including *Penicillus* sp., *Caulerpa* sp., and *Halimeda* sp. Also observed were occasional cushion stars (*Oreaster reticulatus*), a donkey dung sea cucumber (*Holothuria mexicana*), sea anemones, sponges, and occasional reef fish.



PHOTO 13: BARREN SAND BOTTOM



PHOTO 14: ROCK SUBSTRATE



PHOTO 15: ROCK SUBSTRATE



PHOTO 16: TURTLE GRASS BED



RENDEZVOUS BAY SHORELINE AS PHOTOGRAPHED BY EDGEWATER TEAM

ANGUILLA

ENVIRONMENTAL CONSIDERATIONS

LITTLE HARBOUR

Little Harbour consists of an entrance channel bounded on the southeast by a relic reef rubble jetty (Photo 17) leading to a protected inner basin. The entrance channel and basin is colonized by Mediterranean seagrass (*H. stipulacea*), which is an exotic species from the Indian Ocean (Photos 18 and 19). This species generally forms dense beds and coverage within Little Harbour ranged between 30% and 70%. The relic reef structures on either side of the entrance channel were colonized by macroalgae (i.e. *Padina* sp., *Dictyota* sp., *Caulerpa* sp., *Halimeda* sp.) with occasional sponges and stony corals (i.e. *Porites asteroides*, *Porites porites*; Photo 20). Also observed were rock boring urchins, an arrow crab (*Stenorhynchus seticornis*), a donkey dung sea cucumber (*Holothuria mexicana*), southern stingray (*Dasyatis americana*), and occasional reef fish.



PHOTO 17: REEF RUBBLE JETTY



PHOTO 18: INVASIVE MEDITERANIAN SEAGRASS (*HALOPHILA STIPULACEA*)



PHOTO 19: CLOSE-UP OF *HALOPHILA STIPULACEA*



PHOTO 20: RELIC REEF WITH CORAL AND MACROALGAE



LITTLE HARBOUR SHORELINE AS PHOTOGRAPHED BY EDGEWATER TEAM



Of the areas surveyed during this cursory biological assessment, the highest value ecological habitat was located along the western shoreline of Scrub Island. This area supported the largest coral colonies, which were growing on relic coral formations. This area appeared to have been damaged by recent hurricanes. If an entrance channel is proposed in this area, any corals suitable for relocation should be transplanted to an area with comparable water depth, exposure, and substrate.

The other area with very high value ecological habitat is the ballast pile in the northwest portion of the basin at Sandy Ground. It is recommended that impacts to the ballast pile be avoided if at all possible. If the entrance channel is to be located here, ballast rocks supporting stony corals and sponges should be cached in an appropriate area, while the remainder of the ballast is relocated to a suitable area devoid of ecological resources to create a foundation. The boulders with stony corals and sponges can then be added to the pile, in a stable configuration that is likely to protect the resources growing on them.

Halophila stipulacea is an invasive, exotic seagrass, native to the Indian Ocean¹¹. The species has been documented in the Caribbean and is currently being studied by the University of the Virgin Islands. This species was found in a near monoculture in Little Harbor and colonized much of Sandy Ground. The grass is outcompeting native seagrass species and provides reduced habitat value. Impacts to this species should not require ecological mitigation.



CORAL PHOTOGRAPHED AT SANDY GROUND
BALLAST PILE PHOTOGRAPHED BY EDGEWATER
TEAM



INVASIVE SEAGRASS AT LITTLE HARBOUR AND
SANDY GROUND PHOTOGRAPHED BY EDGEWATER
TEAM



SCRUB ISLAND SHORELINE, THE HIGHEST VALUE ECOLOGICAL HABITAT PHOTOGRAPHED BY EDGEWATER TEAM



LESSER ANTILLEAN BULLFINCH

IMPORTANT BIRD AREAS OF ANGUILLA

There are 16 Important Bird and Biodiversity Areas (IBAs) on Anguilla and 5 of the surrounding islands. An IBA is an area that has been identified by BirdLife International, using internationally accepted criteria, to label globally important areas for the conservation of bird species. The Anguilla IBAs encompass approximately 5,091 hectares (12,580 acres) and have been identified on the basis of 17 key bird species, including 5 restricted range species (Caribbean elaenia, Green-throated carib, Antillean Crested Hummingbird, Lesser Antillean bullfinch, and Pearly-eyed thrasher) and 13 congregatory seabirds (red-billed tropicbird, magnificent frigatebird, brown pelican, masked and brown booby, laughing gull, brown noddy, and the royal, roseate, least, bridled, and sooty terns¹³).

There are 16 species of nesting seabirds present during the breeding season and over 130 species of birds that reside in Anguilla for all, or a portion of the year. It is estimated that a third of these are resident species. Four of the cays off Anguilla have been designated IBAs by Birdlife International due to their large congregations of nesting seabirds. The salt ponds on the island are wetlands and provide critical habitat for both resident and migratory seabirds. Species include the brown booby, magnificent frigatebird, least tern, semipalmated sandpiper, Antillean crested hummingbird, caribbean elaenia, as well as other raptors, herons, waders, and waterfowl. Most of Anguilla's IBA's are located on privately held land and are not protected¹⁴.

The mainland of Anguilla has 25 main salt ponds, which are the only wetlands on the limestone island. Of these, 22 are natural and the other three are manmade¹⁵. Many of these salt ponds were historically used to harvest salt from the ocean. These salt ponds are a favorite feeding and resting ground for migratory and native shorebirds. These salt ponds also act as reservoirs and help to minimize flooding during tropical downpours¹⁶.





PEARLY-EYED THRASHER

LISTED SPECIES

Anguilla hosts 321 native plants, of which approximately 65% of plant species on Anguilla are native with the other 35% being exotic¹⁷. Anguilla has one endemic plant species, the Anguilla bush (*Rondeletia anguillensis*), a species of small shrub, which predominantly grows on the northwest side of the island on limestone outcrops. Anguilla also hosts two Caribbean endemic genera of plants (*Dendropemon* and *Hypelate*).

There are 21 species of reptiles reported in Anguilla, of which only two are endemic [the Censky's ameiva (*Ameiva corax*) and the Sombrero ameiva (*Ameiva corvina*)] and are restricted to the outer islands of Little Scrub and Sombrero Island, respectively¹⁸. Other native faunal species include the endangered Anguilla Bank Racers and Lesser Antillean Iguanas. Threatened sea turtles including the hawksbill (*Eretmochelys imbricata*), green (*Chelonia mydas*), and leatherback (*Dermochelys coriacea*) nest on Anguilla's beaches, while the loggerhead (*Caretta caretta*) has been observed in the nearshore waters. The Anguilla National Trust monitors sea turtle nesting along Anguilla's beaches and has been instrumental in extending the moratorium on sea turtle harvesting¹⁹. The island is surrounded by 50 square kilometers (19 square miles) of coral reef²⁰. Migrating humpback whales and sperm whales have been observed off the northwest and west coasts²¹. Native faunal species that are regionally important also include 5 species of bats (Anguilla's only native terrestrial mammals) and a host of resident and migratory birds. The Country has more than 20 uninhabited limestone islands, which provided habitat for endemic and globally threatened lizards, invertebrates, and birds. Some of these islands, along with multiple mainland salt ponds, are designated as Important Bird Areas.

Exotic invasive faunal species include Cuban tree frog, giant African snail, black rats, brown rats, cats, green iguanas, lionfish, and goats. *Halophila stipulacea* is an invasive, exotic seagrass, native to the Indian Ocean²². The species has been documented in the Caribbean and is found in the nearshore waters in Anguilla.

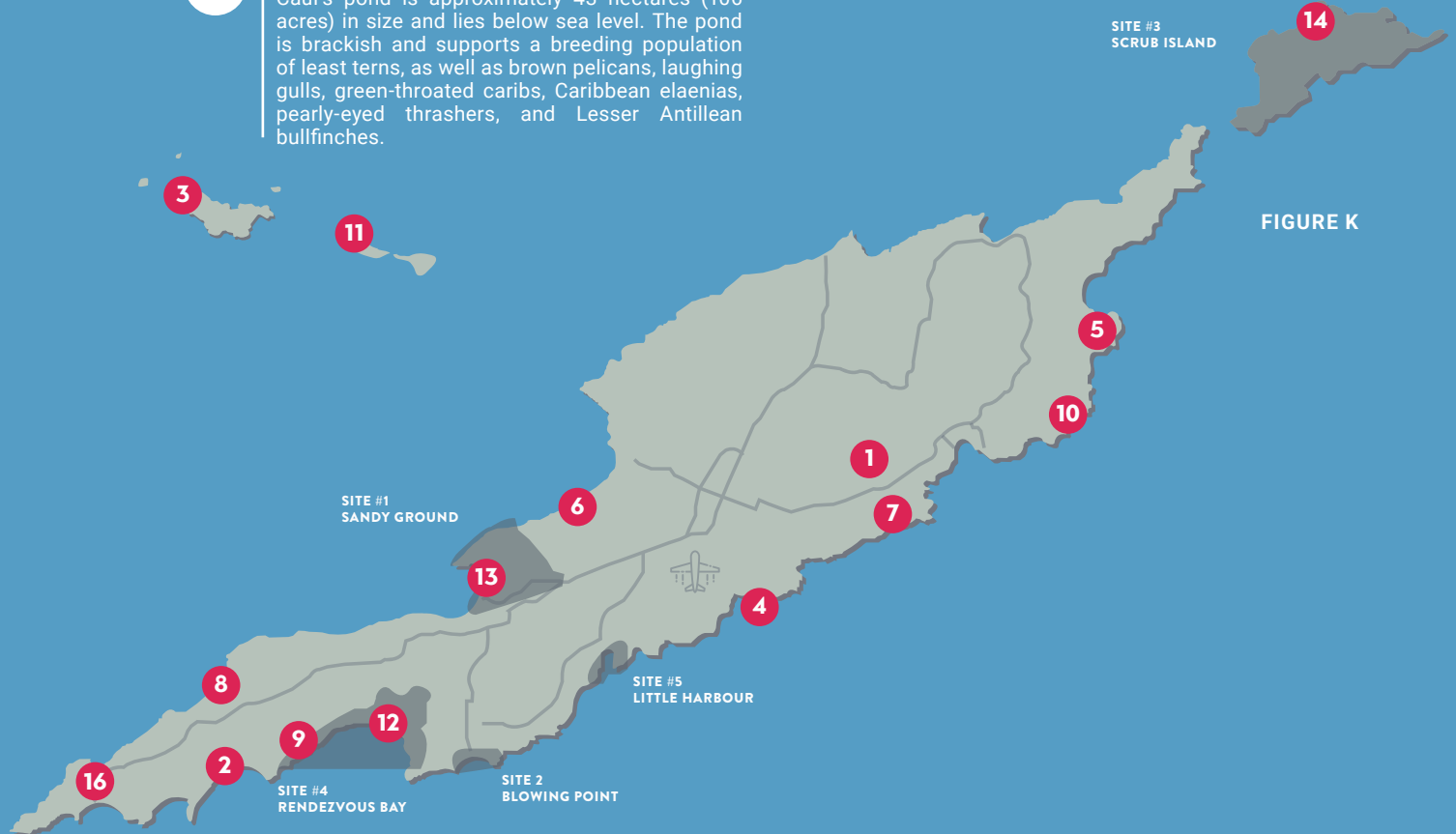
Several of these salt ponds are designated IBAs due to large colonies of nesting seabirds. Specifically, 1) Cauls Pond, 2) Cove Pond, 3) Dog Island, 4) Forest Bay Pond, 5) Grey Pond, 6) Katouche Canyon, 7) Long Salt Pond, 8) Meads Bay Pond, 9) Merrywing Pond System, 10) Mimi Bay, 11) Prickly Pear East and West, 12) Rendezvous Bay Pond, 13) Road Salt Pond, 14) Scrub Island, 15) Sombrero, and 16) West End Pond. The salt ponds also support other wildlife including 5 of the Lesser Antilles Restricted Range Species (see FIGURE K).

IMPORTANT BIRD AREAS OF ANGUILLA MAP

1

CAUL'S POND

Caul's pond is approximately 43 hectares (106 acres) in size and lies below sea level. The pond is brackish and supports a breeding population of least terns, as well as brown pelicans, laughing gulls, green-throated caribs, Caribbean elaenias, pearly-eyed thrashers, and Lesser Antillean bullfinches.



2

COVE POND

Cove pond is approximately 287 hectares (709 acres) in size and is relatively shallow. It is part of a coastal lagoon, but was separated by the causeway constructed to access Cap Jaluca. Over 40 species of birds have been observed nesting, resting, and feeding at this pond, including a breeding colony of least terns and wintering common terns. Other birds frequently observed at this site include snowy and piping plovers, green-throated carib, and Lesser Antillean bullfinches.

3

DOG ISLAND

Dog Island is also known as Codania, is located 13 kilometers (8.1 miles) northwest of mainland Anguilla on the Anguilla Bank. There are large ponds located inside of two of the beaches. This island is home to over 100,000 pairs of sooty terns, as well as red-billed tropic birds, magnificent Frigatebirds, masked and brown boobies, laughing gulls, bridled terns, and brown noddies. In addition to feral goats, the island is also home to a variety of reptiles including the Anguilla Bank ameiva, Anguilla Bank anole, little dwarf gecko, island least gecko, and Mabuya skink.

4

FOREST BAY POND

Forest Bay Pond is approximately 3 hectares (7.4 acres) and is brackish. There are two basins separated by a mudflat. This pond supports populations of green-throated caribs, Caribbean elaenias, pearly-eyed thrashers, and Lesser Antillean bullfinches.

5

GREY POND

Grey pond is approximately 191 hectares (472 acres) and relatively shallow. This site is an important nesting site for least terns, as well as white-cheeked pintails, black-necked stilts, snowy plovers, willets, green-throated caribs, and Caribbean elaenias.

6

KATOUCHE CANYON

Katouche Canyon is within Katouche Valley, which is one of the only remaining forested areas in Anguilla. The Valley includes one small pond and two limestone caves. The pond is a seasonal brackish lagoon that provides habitat for the Caribbean elaenias, Antillean-crested hummingbirds, Pearly-eyed thrashers, Lesser Antillean bullfinches, Lesser yellowlegs and white-cheeked pintails.

7

LONG SALT POND

Long Salt pond is approximately 23 hectares (57 acres) in size and is important habitat for least terns, common terns, snowy plovers, green-throated caribs, and Caribbean elaenias.

8

MEADS BAY POND

Mead's Bay pond is approximately 21 hectares (52 acres) in size and supports least terns and royal terns.

9

MERRYWING POND SYSTEM

The Merrywing Pond system includes five small ponds with a total area of approximately 9 hectares (22 acres). The system is located on the Cuisinart Golf Course. The system includes two ponds (Merrywing North and Merrywing South) that serve as artificial freshwater wetlands that are used for water storage and irrigation, while the remaining three ponds (Merrywing Savannah, Merrywing Villas and Merrywing Merrywing) are natural brackish ponds that are comprised of a marl substrate. Merrywing Merrywing is located closest to Cove Bay and its northern shore is lined by a narrow strand of buttonwood mangroves.

The ponds support green-throated caribs, Caribbean elaenias, and Lesser Antillean bullfinches. The pond also provides habitat for the least tern, a species considered to be an endangered in the countries along its migration route. The Merrywing Pond system IBA is located southwest of the Rendezvous Bay Site and outside the direct influence of this potential project area.

10

MIMI BAY

Mimi Bay Pond is approximately 0.49 hectares (1.2 acres) and supports an average of 15 species of birds including black eyed stilts.

11

PRICKLY PEAR EAST & WEST

The Prickly Pear Cays are located approximately 10 kilometers (6 miles) from Road Bay on the Anguilla Bank and contain several salt ponds. Birds observed include red-billed tropicbirds, brown pelicans, brown boobies, laughing gulls, least terns, brown noddies, bridled terns, Caribbean elaenias, and yellow warblers.

12

RENDEZVOUS BAY POND

Rendezvous Bay pond is a large brackish pond, approximately 24 hectares (59 acres) in size, along the southwest coast of Anguilla. A narrow strip of relatively flat sandy land separates the pond from the adjoining sea. The pond is relatively shallow, and was historically used for salt production which ended in the 1970's. The west end and east end of the pond are separated by a narrow dirt road that had been backfilled. The east side of the pond is relatively undeveloped and is grazed by cattle. The west end of Rendezvous Bay Pond has several hotels and has been subject to pollution through infilling of the southwest corner to create parking. This pond supports white-cheeked pintail, black-necked stilt, killdeer, least terns, common terns, and brown pelicans. The Rendezvous Bay Pond IBA is located within the Rendezvous Bay project site and within the direct influence of this potential project area.

15

SOMBRERO

Sombrero is also known as Hat Island and is located 55 kilometers (34 miles) northwest of Anguilla. The island was mined for guano for phosphate prior to 1890, which altered its landscape. The island supports masked boobies, brown boobies, bridled terns, brown noddies, and sooty terns.

13

ROAD SALT POND

Road Salt pond is approximately 43 hectares (106 acres) in size and is the largest enclosed body of water on the island. The salt pond is adjacent to the settlement and port at Sandy Ground and the area surrounding the pond has been altered for development. West of the pond is a flat dune system that has been largely developed while the north, east and south coasts of the pond support some of the highest hills on Anguilla. This pond was historically the center of salt production on Anguilla until the 1970's and some of the saltwork infrastructure still lines the inner perimeter. The pond has been subjected to infilling and is now bordered by a road. Shoreline vegetation is sparse, except for along the eastern shoreline, due to residential and commercial development and the construction of the road. The vegetation also suffers from grazing from free roaming and tethered sheep and goats. The pond consists of large areas of shallow water that attracts wading and shorebirds. The perimeter of the pond is the most heavily used area by birds. The Road Salt Pond attracts the widest range of species of any other site on Anguilla. The edges of the pond support breeding species such as green herons, white-cheeked pintails, and common moorhens. The drier areas of the pond support nesting birds like killdeer, wilson's plover, and black-necked stilts. The walls of the salt pond support nesting least terns and many of Anguilla's residential land birds (mangrove cuckoo, Caribbean elaenias, pearly-eyed thrashers, and Lesser Antillean bullfinches) breed in the dry forest scrub surrounding the pond.

The Road Salt Pond IBA is located within the Sandy Ground project site and within the direct influence of this potential project area. Future development of this area should be coordinated with the Anguillian National Trust and should aim to preserve some of the shallow water, emergent vegetation, and shoreline vegetation along the northern half of the pond. Additionally, revetment walls can be established as alternative suitable places for least terns to nest. In addition to the monthly bird surveys conducted by the Anguillian National Trust, site monitoring should occur during construction to ensure avoidance of areas of active nesting or foraging to ensure minimal effects to nesting and visiting birds as a result of Project construction, if implemented at this site.

14

SCRUB ISLAND

Scrub Island is the largest of Anguilla's out islands and is located approximately 1 kilometer (0.6 mile) northeast of the mainland. The island consists of low-lying rocky limestone, white sandy beaches, and 5 small ponds and coastal lagoons that support laughing gulls, Caribbean elaenias, common ground doves, yellow warblers, and pearly-eyed thrashers. Eight species of breeding seabirds nest on the island: red-billed tropicbird, laughing gulls, royal terns, sandwich terns, least terns, bridle terns, brown noddies and Anguilla's only breeding population of roseate terns. Other waterfowl and wetland birds such as white-cheeked pintail, American oystercatcher, black-necked stilt, willets and Wilsons plovers also use the island for breeding.

The Scrub Island IBA is located within the Scrub Island project site and within the direct influence of this potential project. Future development of this area should aim to preserve some of the beaches, ponds and wetland vegetation to ensure minimal effects to nesting and visiting birds occur as a result of the Project if implemented at this site.

16

WEST END POND

West End pond is approximately 19 hectares (47 acres) in size and was historically used for salt production. The pond supports royal and common terns, Caribbean elaenias, and Lesser Antillean bullfinches.

SEA LEVEL RISE & RESILIENCY

ANGUILLA'S BEACHES AND SALT PONDS ARE PARTICULARLY VULNERABLE TO SEA LEVEL RISE DUE TO THEIR LOW ELEVATIONS. THE MAP BELOW, BASED ON DATA FROM THE DRAFT CLIMATE CHANGE POLICY, PREPARED IN 2011, HIGHLIGHTS THESE VULNERABLE AREAS.

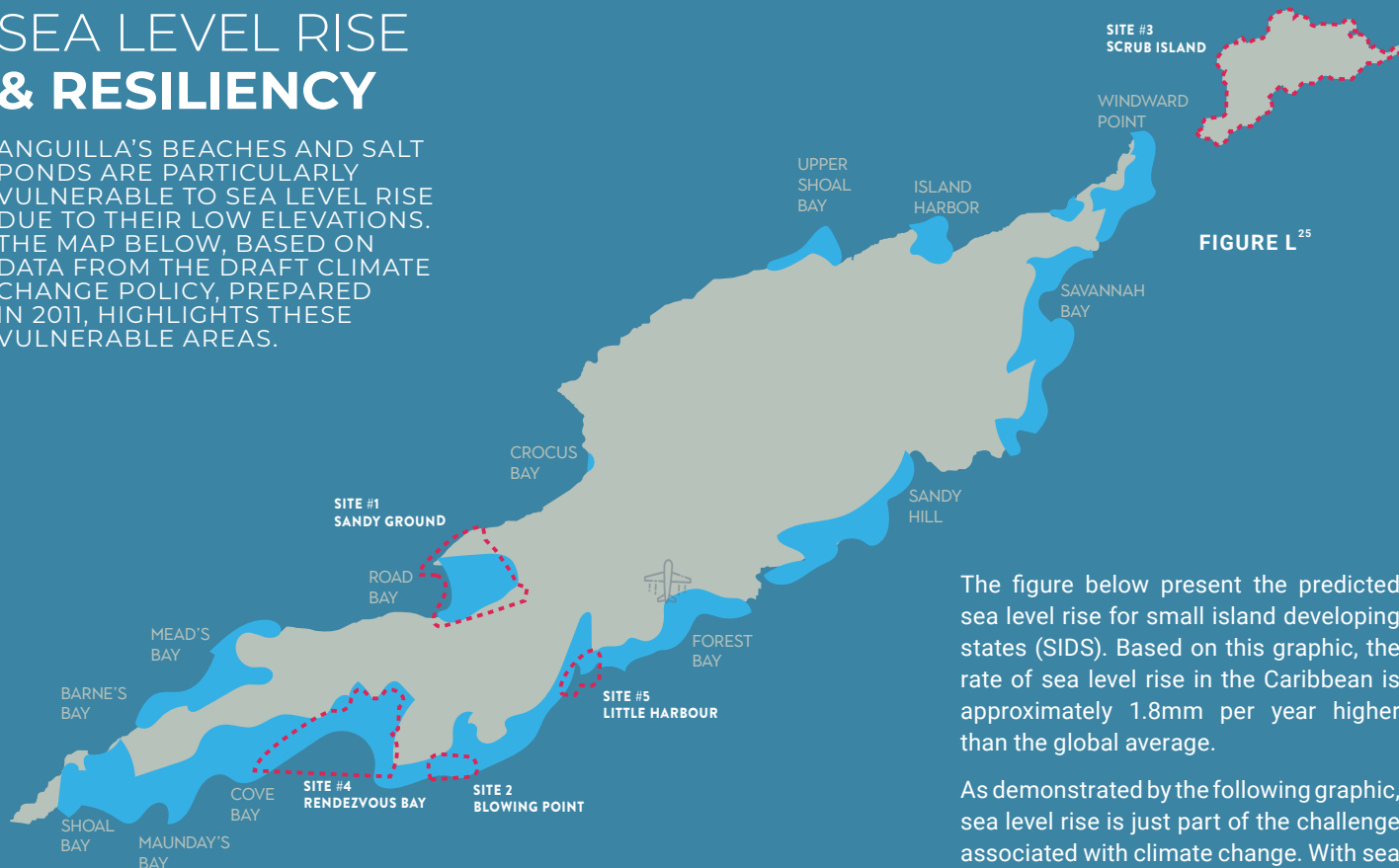


FIGURE L²⁵

Climate change is inevitable and knowing this provides time to plan and adapt. Climate change will bring warmer waters, more frequent and intense storms, and higher water levels. Rising sea temperatures and more frequent storm events and hurricanes have already impacted Anguilla's coral reefs and mangrove strands²⁴. As a result of continued climate change, corals will bleach or adapt, shorelines will be inundated, and inferior structures and infrastructure will be destroyed. Reconstruction in vulnerable areas must take sea level rise and storm intensity into account. In some areas, retreat may be the only option.

An effort has been underway since at least 2008 to identify, assess, and respond to these impacts in Anguilla. Anguillians are being educated on the effects of climate change and how they can mitigate them. Marine Protected Areas have been established to protect the coral reefs that buffer the island from intense wave action. The draft Physical Planning Act is being reviewed to address land based pollution issues. Guidance is being provided to developers to ensure that climate change is integrated into

the environmental impact assessment process and incorporated into project designs.

The Department of the Environment promotes and supports the sustainable use and development of the natural resources through the enactment of legislation and regulations. These efforts include important legislation such as the Draft Environmental Protection Bill, Land Development Control Act, Marine Parks Act, and the Beach Protection Act. It is recognized that the beaches are an important resource, not only for tourism and recreation, but for shore protection. As such, the Beach Protection Act makes it illegal to remove sand, stones, or gravel from protected beaches. The Land Development (Control) Regulations identify permitted development and set forth permitting provisions for such.

It is critically important that Anguilla continue on this path towards becoming more resilient. As there are few options available to protect the beaches and salt ponds over the long term, retreat may be necessary in some areas. In the interim, it is essential that all development consider practicable measures to accommodate reasonably foreseeable sea level rise and windstorm conditions.

The figure below present the predicted sea level rise for small island developing states (SIDS). Based on this graphic, the rate of sea level rise in the Caribbean is approximately 1.8mm per year higher than the global average.

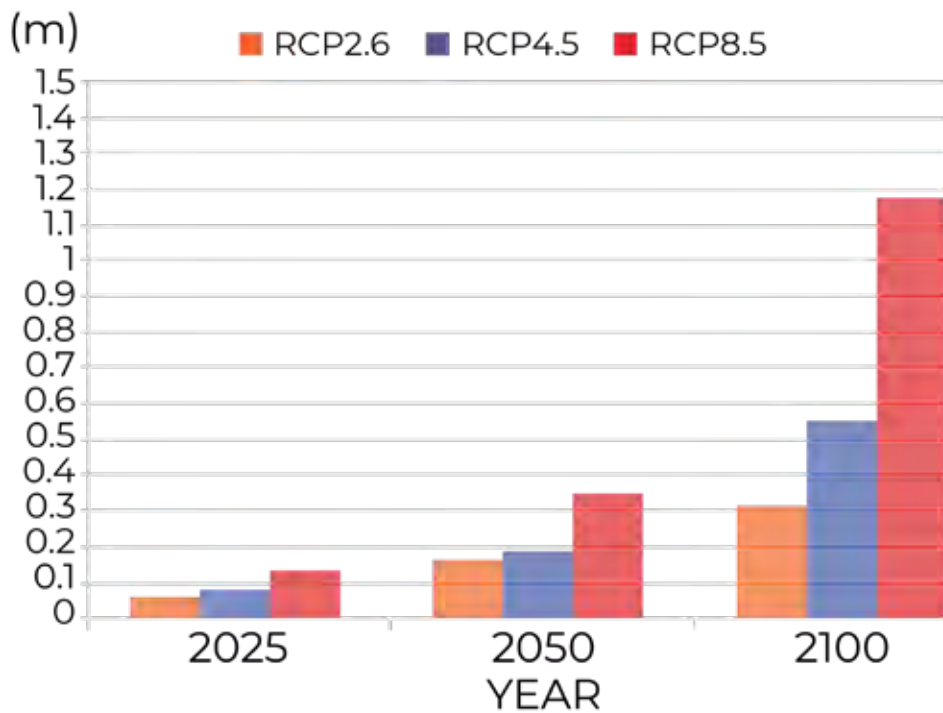
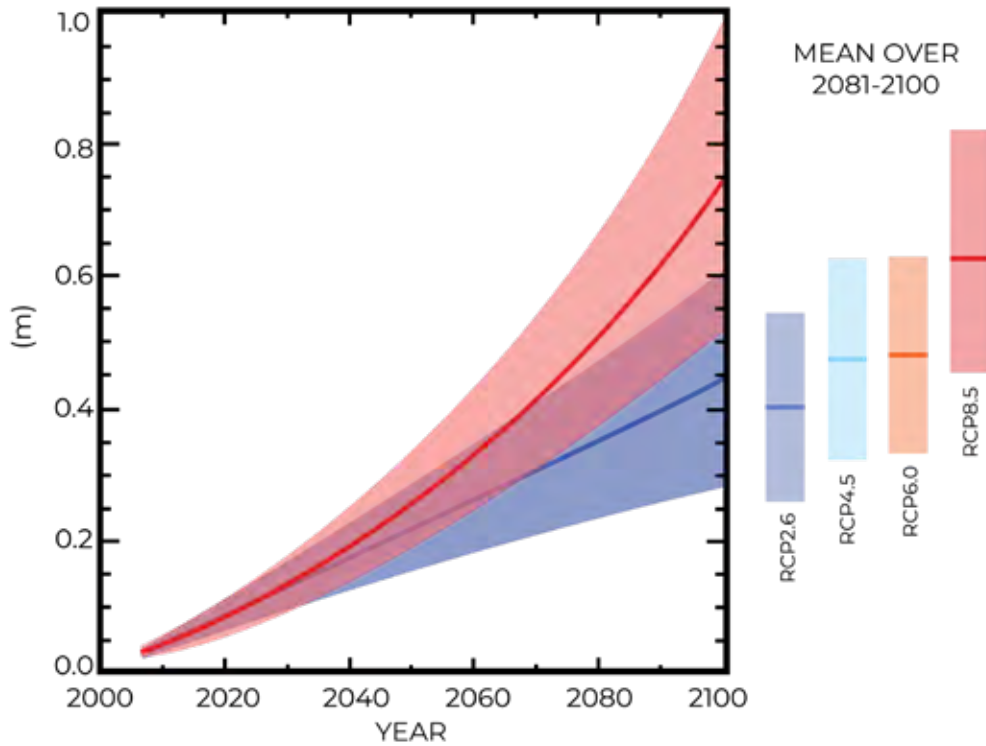
As demonstrated by the following graphic, sea level rise is just part of the challenge associated with climate change. With sea level rise, the effects of other increases in water level are exacerbated.

It is difficult to predict how high sea levels will rise or how quickly; however, based upon a review of available information for the Caribbean region; it appears that planning for an increase of 0.25 to 0.40 meters (0.25 to 1.31 feet) over the next 50 years is reasonable. However, additional consideration should be given to the anticipated increase in storm surge due to increased storm intensity. Utilizing floating docks as opposed to fixed docks will address sea level rise over time. Developing uplands at sufficient elevations will ensure their protection during storm events. Similarly, key infrastructure must be placed at sufficiently higher elevations to allow for functionality and access during storm events. Buildings should be constructed on stilts with lower levels designed with breakaway walls or dry flood proofing. Building standards developed for Florida, particularly Monroe County, should be considered for any new construction. To account for sea level rise reasonable anticipated during the life of the proposed structures, we have specified the ground elevation in our conceptual designs at +2.1 meters (+7 feet) Mean Sea Level.



GLOBAL MEAN SEA LEVEL RISE (FIGURE M)

THE FIGURE BELOW PREDICTS SEA LEVEL RISE FOR SMALL ISLAND DEVELOPING STATES (SIDS). BASED ON THIS GRAPHIC, THE RATE OF SEA LEVEL RISE IN THE CARIBBEAN IS APPROX 1.8MM PER YEAR HIGHER THAN THE GLOBAL AVERAGE.



ST. LUCIA SEA LEVEL RISE PROJECTIONS (FIGURE N)

FIGURE SHOWS THE SEA LEVEL RISE PROJECTIONS FOR NEARBY ST. LUCIA. THIS GRAPHIC SHOWS PREDICTED SEA LEVEL RISE TO BE JUST LESS THAN 1.2 METERS (3.9 FEET) BY 2100.



V. MARINA CONCEPTS

FIVE SELECTED SITES



ANGUILLA MARINA PLAN RECOMMENDATIONS

ADDITIONAL RECOMMENDATIONS FOR THE MARINA WOULD INCLUDE THE FOLLOWING:



CONCRETE DOCK SYSTEM

Marina should use a high quality concrete floating dock system with state-of-the-art utilities.



ENTRANCE CHANNEL

The marina should have a safe entrance channel with protection from wind and waves.

STORM PROTECTION

The marina basin should be protected from storms and surge.





YACHT CLUB & AMENITIES

The overall site plan should include a high quality yacht club with amenities for crew including lodging, health club, restaurant, and the like.



APPROPRIATE SECURITY

The marina should include discrete security for the yachts.



WATER DEPTH

Water depth within the marina basin should be 5 meters (17 feet) for the megayachts larger than 46M (150 feet), 4 meters (12 feet) for smaller yachts 24-30 meters (80-100 feet), and 2 meters (8 feet) for recreational and commercial vessels less than 24meters (80 feet).

SERVICE AREA

A service area, where vessels can moor broadside, should be designated for in-water servicing of yachts.

ANGUILLA MEGAYACHT MARINAS



MARINA CONCEPT PLANS

Preliminary conceptual designs have been developed for the 5 selected potential marina sites. Each site varies in size and existing allowable space for the construction of a megayacht marina with accompanying upland development. Along with the conceptual plans, preliminary cost estimates have been developed to help gauge budgetary pricing that would be required for construction.

Property limits of each site have been provided by the Anguilla Department of Land and Surveys to help identify the existing land ownership boundaries. The property limits are necessary to identify the areas of highest potential for developing a megayacht facility, while being mindful of existing property owners. Detailed information on property ownership of the parcels is not known at this time, and

therefore, some of the concept plans suggest that property should be acquired to develop a marina facility.

In addition to the schematic conceptual site plans that have been developed for each site, detailed features of the marina design were considered. The section below outlines additional aspects that were considered as part of the overall marina design.



MARINA

DESIGN CONSIDERATIONS

MARINA DEPTHS

Large megayachts will require a depth of 5 meters (17 feet) below mean sea level. Smaller yachts can handle water depths in the range of 3 meters (10 feet) to 4 meters (12 feet) and smaller local vessels being 12 meters (40 feet) to 24 meters (80 feet) in length, would require 2 meters (8 feet), except for an occasional deep draft sailboat, which would require additional water depth.



MARINA DOCKS

Docks can be separated into two types: fixed and floating. Fixed docks are most often supported by driven piling, while floating docks are free to move up and down with changing tides and water levels. Fixed structures are typically constructed with timber or concrete in various configurations. Fixed docks provide stable mooring environments that can provide many years of service, but specified elevations must take into consideration anticipated sea level rise within the design life of the structures. In addition, fixed structures are typically more expensive to construct.

Floating dock freeboards are independent of water levels, allowing the docks to maintain consistent mooring environments as water levels fluctuate. Floating docks are manufactured in many configurations and from many different materials, including steel, aluminum, timber, and concrete. In salt water environments typical floating dock system materials include concrete, aluminum, or a mixture of the two, due to their resistance to corrosion. Floatation typically consists of either polyethylene-encased polystyrene “tubs” or concrete-encased polystyrene. Floating dock systems are typically less expensive and can minimize disturbances to the sea bottom.

Floating docks can be anchored by various methods including fixed guide piles, telescoping spud piles, chain and anchor systems, and flexible-rode systems, like Seaflex. The cost to install piling can be significant, especially in remote oceanic environments, like Anguilla, where the substrate is often dense coral and specialized equipment is less readily available causing installation to become more labor intensive. The anchors associated with chain and flexible rode systems can consist of driven helical piles or a mass deadman anchors, which are typically made of concrete. The anchor is connected to the dock system by a chain or flexible rod system with flexible rubber hawsers, as shown in the example photos at right. Chain anchor lines are simple and relatively inexpensive, while a flexible rode system is more resistant to corrosive environments and often has a longer service life. Due to the weight of chain and the need for slack, chain anchor lines will typically drag on the sea bottom, disturbing marine life, whereas flexible rode lines do not drag on bottom. A flexible rode anchorage system would be the preferred option for each of the potential marina sites, due to its ability to self-adjust to tidal ranges, longer anticipated service life, and ability to minimize sea bottom disturbances. The use of concrete blocks or stake piles is dependent upon many variables including the type and strength of the substrate material. The choice between the two anchor types is typically made during final design with the benefit of additional site data.

MARINA

DESIGN CONSIDERATIONS (CONTINUED)

WAVE ATTENUATION

The desired wave climate can vary based on location and conditions found at comparable facilities; however, the common criteria for comfortable and safe mooring conditions within a marina is to provide wave conditions of less than 0.3 meter (1 foot) in height. In order to achieve the desired wave climate, the use of breakwaters and wave attenuators is often implemented. As with docks, wave attenuation can be accomplished by both floating and fixed structures.

Fixed breakwaters are typically constructed with 4.5 to 9.1 metric tons (5 to 10 tons) armor stone. They provide maximum protection to a marina; however, they are the most expensive to construct, especially in locations like Anguilla where fill material and stone are not readily available. In locations with significant wave action and exposure to open coastal conditions, fixed breakwaters may be the only feasible approach. However, in certain cases, a fixed breakwater is not necessary due to site conditions and floating breakwaters will provide an acceptable level of protection at a lower cost.



Floating breakwaters, or wave attenuators, can provide effective protection in many cases to create the desired mooring environment. Floating breakwaters are constructed with various materials, including concrete, timber, steel, and aluminum. At each of the potential marina sites evaluated on Anguilla, concrete is the preferred material for a floating breakwater due to its superior mass characteristics and durability in salt water environments. When sized appropriately, concrete floating breakwaters have wave attenuation efficiency in excess of 75%, meaning that a 0.6 meter (2 foot) wave would be reduced to a 0.15 meter (0.5 foot) wave.

In addition, within the marina, waves will be dampened and attenuated by shoreline revetments, docking structures, and the overall mass of moored vessels. Docks and vessels will both dissipate waves and prevent them from gaining additional amplitude and speed within the marina basin.

GANGWAYS

Gangways and dock systems themselves can be designed for both pedestrian and golf cart use to carry the significant weight of goods and items to yachts for service and provisioning. Gangways would typically be designed with gentle grades, consistent with international disability access slopes, throughout the site.



MARINA

DESIGN CONSIDERATIONS

MARINA UTILITIES



Standard dock utilities include, at minimum, potable water, power, and Wi-Fi. Typically, a point-of-use sanitary pump-out system is located on site and at higher end facilities pump-out “hydrants” are located near individual berths. Fire protection will include fire hydrants on docks and typically either a wet or dry standpipe system, depending upon local requirements.

At each of the potential marina sites, new utilities will need to be constructed to serve the entire development and the marina demand will need to be included in the planning of utility supply capacities. Water demand in a marina is typically minimal; however, electric demand is significant. The electrical demand of a vessel increases proportionally to its size. Small vessels require enough power for charging batteries and occasionally running devices, while large vessels can house multiple air conditioners and other appliances that have a significant power demand. When a phased marina construction approach is considered, the primary supply to the marina is typically sized for the full build condition. The primary

supply terminates at a main distribution panel (MDP) near the marina and branch feeders supply substations. In the initial phase, the MDP has the capacity for the full build condition; however, only the substations needed for the initial phase are installed and connected. Then, as construction phases advance, branch feeders are extended on site from the MDP to each of the new substations.



SANDY GROUND CONCEPT



SANDY GROUND CONCEPT

Sandy Ground is centrally located on the northern side of the main island of Anguilla, adjacent to Road Bay. A large salt flat exists eastward of Road Bay where a roughly 137 meters (450 feet) land spit separates it from the ocean. A small outflow channel connects the approximately 43 hectare (106 acre) salt flat to Road Bay on the northwestern corner. On the western side of this land spit, lays a beautiful beach roughly 0.8 kilometers (0.5 miles) long that is met by the existing ship loading dock. This area has an authentic and local feel to it, as several restaurants and shops are located right on the beach. The existing shipping port is located on the southern end of Road Bay, where the island receives much of its goods and supplies. There is a large ballast pile at the north end of Road Bay where a qualitative biological impact survey was conducted to assess the biodiversity and presence of existing plant and wildlife habitat. The summary of this survey can be found in the environmental considerations section of this report. The existing depths in Road Bay are favorable when considering the construction of an entrance channel for a megayacht vessel; however, it is anticipated that dredging will be required. The conditions of the selected site at Sandy Ground are favorable for a megayacht facility, while considering the aforementioned existing characteristics.

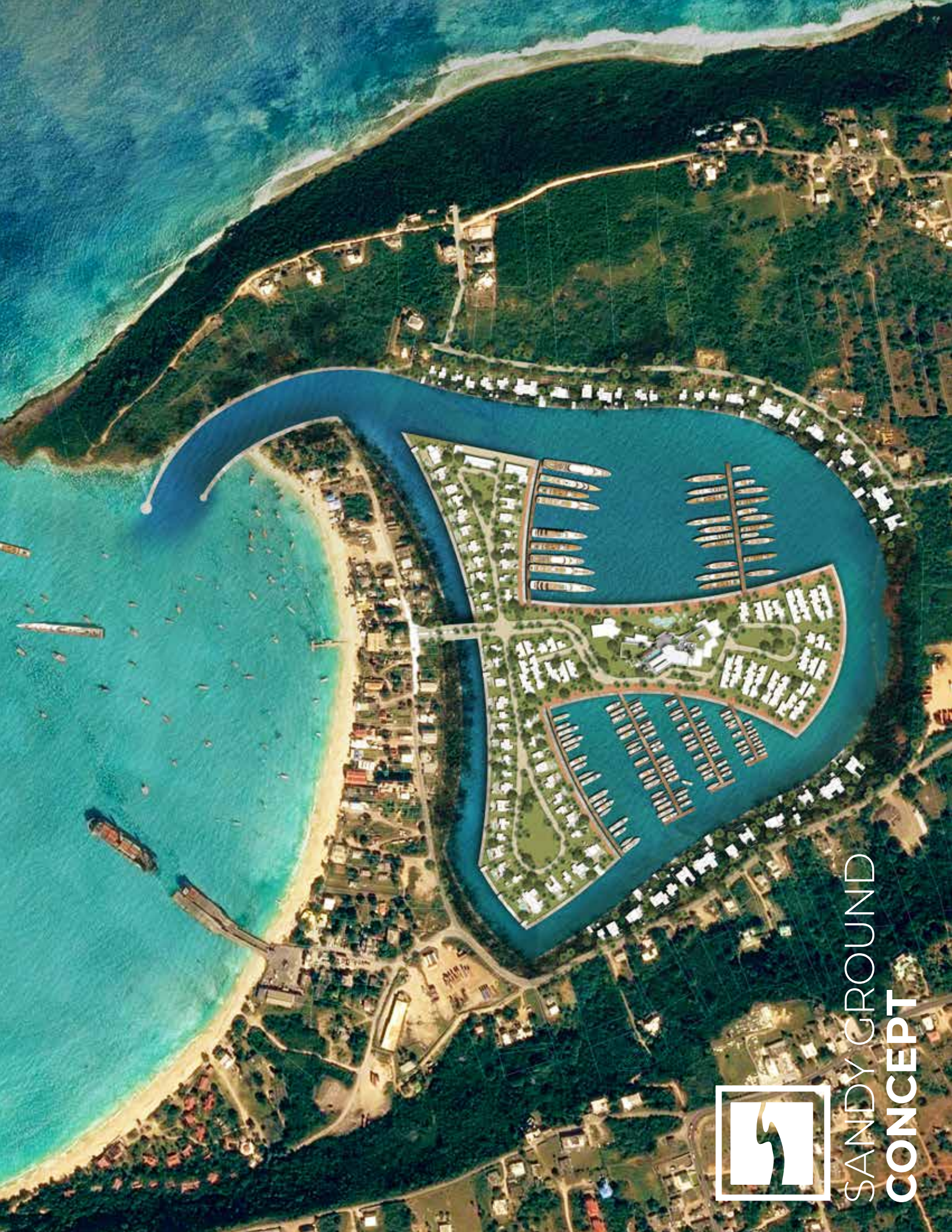
The concepts that were developed for the potential marina site make use of the existing salt pond by suggesting dredging the marina basin in this area. This location proposes the largest footprint comparatively among the 5 sites, which provides the opportunity for a large amount of usable marina space, as well as upland development. The site plan proposes reclaimed material from the dredging areas to create land for development within the marina basin. Also note the two entrance breakwaters that are shown to minimize wave energy that can reach the marina basin. Along the eastern edge of the pond, a preservation area has been designated that incorporates one of the limestone retaining walls used during the days of salt mining. This area, used by nesting least terns and other birds, supports emergent wetland vegetation and upland vegetation, and has been preserved as a nature preserve/bird sanctuary in the conceptual design. In addition to the nature preserve, it is recommended that the upland development include a maritime museum that shares Anguilla’s traditional knowledge, cultural artifacts and history of the local salt mining and maritime heritage. Exhibits can include historic photographs, boat models, salt mining tools, instruments, and other historically significant material relevant to Anguilla’s maritime culture and history. The museum should aim to preserve the history of the salt industry that sustained the island before the advent of tourism.

SANDY GROUND SLIP/MOORING SUMMARY

In addition to the preliminary estimated costs, the associated marina slip/mooring summary can be found in Table 3. The adjacent upland development opportunities are quantified in Table 2. It should be noted that the associated costs required for upland development features and property acquisitions are not included in this estimate. Please see the preliminary cost estimate notes at the end of this Concept Plans & Preliminary Estimated Costs Section for additional information regarding notes for this estimate.

| SLIP MIX | | MED MOORING | | |
|-------------|-------|-------------|-------|-------|
| LENGTH | COUNT | LENGTH | COUNT | LF |
| 40' | 9 | 100' | 16 | 1,600 |
| 50' | 27 | 150' | 12 | 1,800 |
| 60' | 41 | 200' | 10 | 2,000 |
| 80' | 21 | 250' | 6 | 1,500 |
| TOTAL SLIPS | 98 | 300' | 4 | 1,200 |
| TOTAL LF | 5,850 | 400' | 3 | 1,200 |
| | | TOTAL LF | | 9,300 |





SANDY GROUND
CONCEPT

BLOWING POINT CONCEPT



BLOWING POINT CONCEPT

The proposed Blowing Point location is centrally located on the southern side of Anguilla’s main island, and is home to the existing ferry terminal docks, where travelers arrive when coming to Anguilla by sea. The Country’s Security Customs building is located immediately upland of the existing ferry terminal docks. Westward of the existing ferry terminal docks is a beach extending roughly 427 meters (1,400 feet) in length with the remains of a former dolphin exhibit observatory sanctuary that was destroyed in the 2017 recent hurricanes last year (Hurricane Irma, September 2017). There are several existing structures that line the beach westward of the ferry terminal docks. The beach also extends eastward roughly 305 meters (1,000 feet) in length, where it meets the landward end of a coral reef formation. Two reef formations extend outward from either end of the beach creating a somewhat natural harbour/ basin. Within this natural harbour is a mooring field where locals use mooring buoys to secure smaller [(less than 12 meters/ (40 feet))] vessels while they are not in use. Approximately 76 meters (250 feet) inland of the eastern beach is a roughly 2 hectares (5 acres) existing salt pond. The site’s coral reef and salt pond were surveyed and summarized as part of the environmental considerations section of this report. Existing water depths are favorable at this location; however, it is anticipated that dredging will be required to create an entrance channel and outer mooring basin.

The conceptual site plan for Blowing Point, utilizes the observed natural wave break that is present due to the existing reef formation, as well as the inland salt pond. This location encompasses a much smaller footprint when compared to Sandy Ground; however, it introduces the idea of two large rubble mound breakwaters that will enhance the existing natural harbour and create a marine climate that is suitable for mooring megayachts. The concept plan includes the creation of an outer mooring basin for megayachts up to 91 meters (300 feet) and an inner marina basin that utilizes the existing salt pond. The inner basin would handle vessels up to 31 meters (100 feet) in length, in addition to a number of smaller slips ranging from 12 to 24 meters (40 to 80 feet) in length. Development of the uplands should also include the addition of a maritime museum to preserve, and celebrate the legendary captains, boat builders, regattas, and maritime heritage from Anguilla’s rich history.

BLOWING POINT SLIP/MOORING SUMMARY

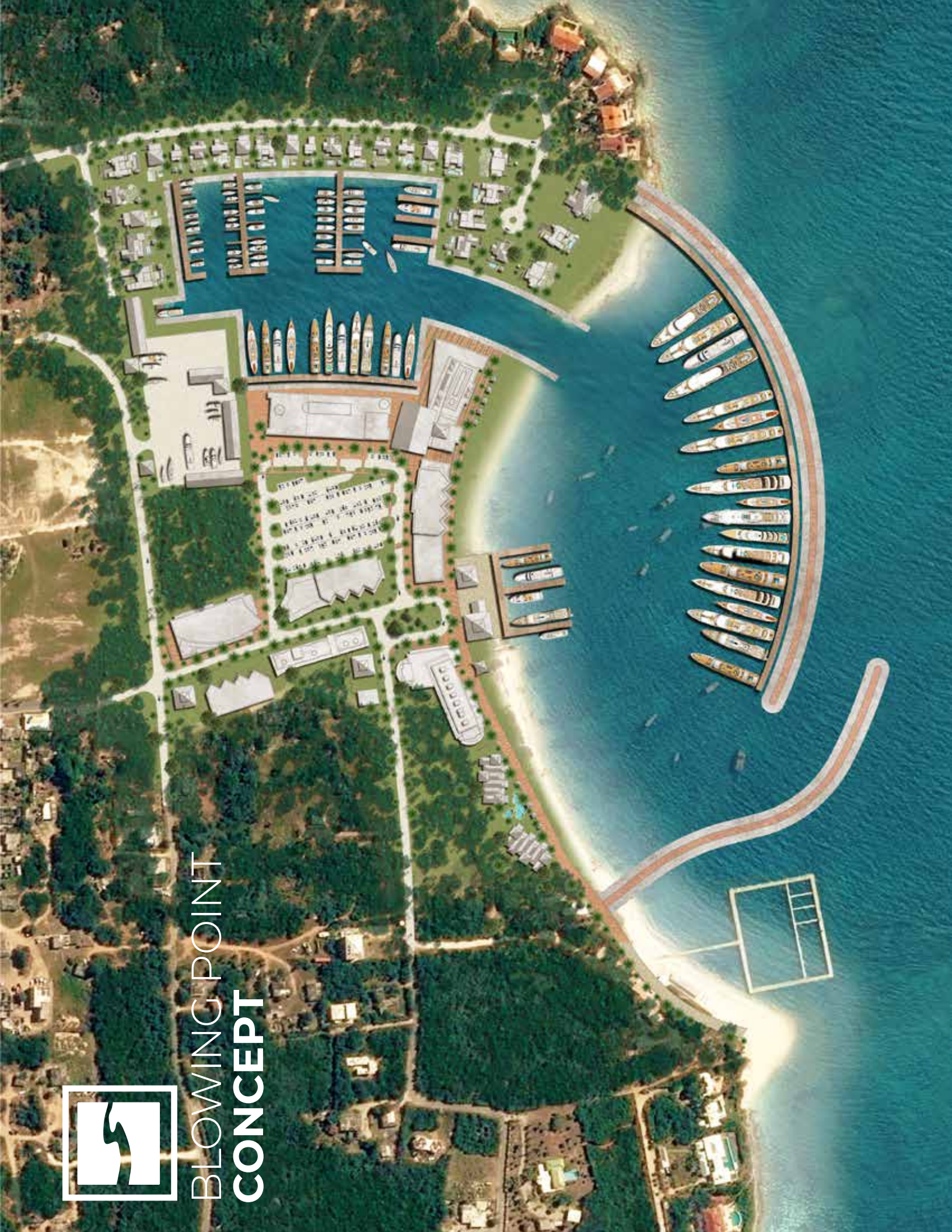
In addition to the preliminary estimated costs, the associated marina slip/ mooring summary can be found in Table 5. The adjacent upland development opportunities are quantified in Table 6. It should be noted that the associated costs required for upland development features and property acquisition are not included in this estimate. Please see the preliminary cost estimate notes at the end of this Concept Plans & Preliminary Estimated Costs section for additional information regarding notes to this estimate.

| TABLE 5: BLOWING POINT SLIP COUNT & MOORING SUMMARY | | | | |
|---|-------|-------------|-------|-------|
| SLIP MIX | | MED MOORING | | |
| LENGTH | COUNT | LENGTH | COUNT | LF |
| 40' | 28 | 200' | 11 | 2,200 |
| 60' | 21 | 250' | 6 | 1,500 |
| 80' | 10 | 300' | 5 | 1,500 |
| 100' | 7 | 400' | 2 | 800 |
| TOTAL SLIPS | 66 | | | |
| BROADSIDE | 600 | | | |
| TOTAL LF | 4,480 | TOTAL LF | | 6,000 |





**BLOWING POINT
CONCEPT**



SCRUB ISLAND CONCEPT



SCRUB ISLAND CONCEPT

Situated northeast of Anguilla’s main island lies Scrub Island, which is approximately 8 square kilometers (3 square miles) of virtually undeveloped land. The island is primarily covered with small trees, scrub vegetation, and exposed limestone bluffs. Remains of a former motel resort can be found on the eastern part of the island and former airstrip is centrally located on the island. Tidal pools make up a large portion of the easternmost shoreline where an adjacent inland salt pond is also situated. Although most of the island’s shoreline is exposed rock outcropping, beaches can be found on the island’s western and southern shoreline. One other salt pond was observed adjacent to the approximately 0.4 mile long beach along the western shoreline. Creating easier access to Scrub Island would allow visitors to explore the remote island’s natural features, while adequately securing vessels at a location other than the beach or mooring offshore. Further development on Scrub Island would influence the demand potential for a megayacht facility at this location. Proper development of Scrub Island, which is reflected in our dual-location plan, will add significantly to the megayacht tourism potential for Anguilla as a whole. Scrub Island provides a unique and appealing opportunity for the mega-rich to have a private location within the Anguilla archipelago that provides a private and exclusive getaway. Megayacht owners are constantly looking for unique travel opportunities to exotic places and Scrub Island provides that. The development of a high quality marina/resort hub on Scrub Island will create an exclusive playground for wealthy global travelers.

The conceptual plan that was developed for Scrub Island shows a marina facility located at both the western and southern shoreline locations to emphasize the versatility that this site has to offer. At the southern marina location, two very large breakwaters are shown to combat the anticipated extreme wind and wave energies from the south easterly direction. Within the inner breakwater is a small 20 slip facility that would provide docking for vessels up to 18 meters (60 feet) in length. Due to the fact that there is no existing power supply on the island, renewable energy options should be evaluated. The existing depths are anticipated to be sufficient for the intended design vessel, which results in no estimated dredging costs. The estimated water depths at this location are adequate for vessel navigation; however, the water depths may render the required breakwaters cost prohibitive.

At the western marina site, it is proposed that the existing salt pond is dredged for a marina basin with an adjacent entrance channel. The proposed entrance channel meanders approximately 610 meters (2000 feet) from the southern limit of the beach area to the marina basin. To combat wind and wave energies from the west and north west, two entrance breakwaters are suggested, with an additional detached breakwater to prevent wave action from entering the channel. A large circulation pipe has been implemented into the concept as a water quality measure to flush the proposed basin. Due to the existing topography of the land and salt pond, it is anticipated that a large amount of excavation will be required to fulfill the concept plan. Observed existing depths at entrance channel location are understood to be adequate, although minor dredging is anticipated to be necessary. Please see page 55 for a conceptual site plan for the Scrub Island facility.

In addition to the preliminary estimated costs, the associated marina slip/mooring summary can be found in Tables 8 & 9 below. It should be noted that the associated costs required for upland development features and property acquisition are not included in this estimate. Please see the preliminary cost estimate notes at the end of this Concept Plans & Preliminary Estimated Costs section for additional information regarding notes to this estimate.

SCRUB ISLAND WEST

TABLE 9: SCRUB ISLAND WEST SLIP COUNT & MOORING SUMMARY

| SLIP MIX | | MED MOORING | | |
|-------------|-------|-------------|-------|-------|
| LENGTH | COUNT | LENGTH | COUNT | LF |
| 60' | 10 | 150' | 10 | 1,500 |
| 80' | 10 | 200' | 6 | 1,200 |
| 100' | 8 | 250' | 4 | 1,000 |
| TOTAL SLIPS | 28 | | | |
| TOTAL LF | 2,200 | TOTAL LF | | 3,700 |

SCRUB ISLAND SOUTH

TABLE 8: SCRUB ISLAND SLIP COUNT & MOORING SUMMARY

| SLIP MIX | |
|-------------|-------|
| LENGTH | COUNT |
| 60' | 20 |
| TOTAL SLIPS | 20 |
| TOTAL LF | 1,200 |

TABLE 10: SCRUB ISLAND COMBINED UPLAND DEVELOPMENT OPPORTUNITY

| TYPE | ESTIMATED SIZE (ACRES) |
|-------------|------------------------|
| RESIDENTIAL | 33 |
| COMMERCIAL | 28 |





SCRUB ISLAND
CONCEPT



RENDEZVOUS BAY CONCEPT



RENDEZVOUS BAY

CONCEPT

The identified site at Rendezvous Bay is located approximately 1 mile northwest of the ferry terminal at Blowing Point. The site is situated along the southern shoreline of the island in a somewhat naturally sheltered location where a beach extends for roughly over 1 mile to the west before arriving at Cap Jaluca. A small land spit separates the waters of Rendezvous Bay from an irregular shaped salt pond that is approximately 24 hectares (60 acres) in size. The existing water depths in Rendezvous Bay are the most favorable amongst all of the selected sites, although it's anticipated that dredging will be necessary to create a navigable entrance channel for megayacht vessels.

The conceptual site plan suggests the implementation of an entrance channel on the eastern end of the beach that connects to the salt pond. The vision at this site is for the salt pond to be dredged to create space for a megayacht marina facility. Two entrance breakwaters are shown on either side of the entrance channel to create a sheltered egress route and would also serve as a protection measure to keep the marina basin climate at a suitable state. An area just east of the existing salt pond is shown as additional marina space that would require excavation/dredging to create. The conceptual plan for this site shows the greatest mooring capacity of any of the selected sites with the ability to facilitate a large number of megayacht vessels in addition to smaller vessels in the 12 to 31 meter (40 to 100 foot) range. Please see page 59 for a conceptual site plan for the Rendezvous Bay site.

RENDEZVOUS BAY SLIP/MOORING SUMMARY

In addition to the preliminary estimated costs, the associated marina slip/mooring summary can be found in Table 12. The adjacent upland development opportunities are quantified in Table 13. It should be noted that the associated costs required for upland development features and property acquisition are not included in this estimate. Please see the preliminary cost estimate notes at the end of this Concept Plans & Preliminary Estimated Costs section for additional information regarding notes to this estimate.

| TABLE 12: RENDEZVOUS BAY SLIP COUNT & MOORING SUMMARY | | | | |
|---|-------|-------------|-------|-------|
| SLIP MIX | | MED MOORING | | |
| LENGTH | COUNT | LENGTH | COUNT | LF |
| 40' | 39 | 150' | 16 | 2,400 |
| 60' | 18 | 200' | 20 | 4,000 |
| 80' | 27 | 250' | 12 | 3,000 |
| 100' | 9 | 300' | 10 | 3,000 |
| TOTAL SLIPS | 93 | 400' | 6 | 2,400 |
| BROADSIDE | 620 | | | |
| TOTAL LF | 6,320 | TOTAL LF | | 14800 |





RENDEZVOUS BAY
CONCEPT

LITTLE HARBOUR CONCEPT



LITTLE HARBOUR CONCEPT

Little Harbour is located approximately 3 kilometers (2 miles) northeast of the ferry terminals along the southern shoreline of Anguilla. The site encompasses a unique cove that is naturally sheltered by a long narrow reef that extends southwest from the site. The existing protected cove area is approximately 6.5 hectares (16 acres) in size and has water depths at roughly 1.8 meters (6 feet). Due north is a low area that appears to be a drainage outlet into the sea and surrounding the water body to the east and west exists a number of high end villa's. Navigation into the site is limited due to the reef formation and adjacent land mass that restricts the access width to approximately 137 meters (450 feet). Several other reef/rock formations that were found along the substrate currently pose a hazard to navigation, even for small vessels [less than 12 meters (40 feet)]; therefore, dredging would be necessary to create an entrance channel for megayacht vessels.

Although existing access to this site is limited, the natural reef break could serve as a potentially useful feature in creating a marina facility. The concept plan shows a rubble mound breakwater that extends eastward from the existing shoreline to better protect the suggested marina basin. Due to the smaller footprint of the existing site, this location would not be suitable for large megayachts [over 61 meters (200 feet)] in length. An outer basin would facilitate vessels ranging from 18 to 61 meters (60 to 200 feet) in length, and the inner basin would be primarily for smaller boats less than 24 meters (80 feet). The inner basin shown would require excavation of the low area to the north. Please see page 63 for a (draft) conceptual site plan for the Little Harbour site.

LITTLE HARBOUR SLIP/MOORING SUMMARY

In addition to the preliminary estimated costs, the associated marina slip/mooring summary can be found in Table 16. The adjacent upland development opportunities are quantified in Table 15. It should be noted that the associated costs required for upland development features and property acquisition are not included in this estimate. Please see the preliminary cost estimate notes at the end of this Concept Plans & Preliminary Estimated Costs section for additional information regarding notes to this estimate.

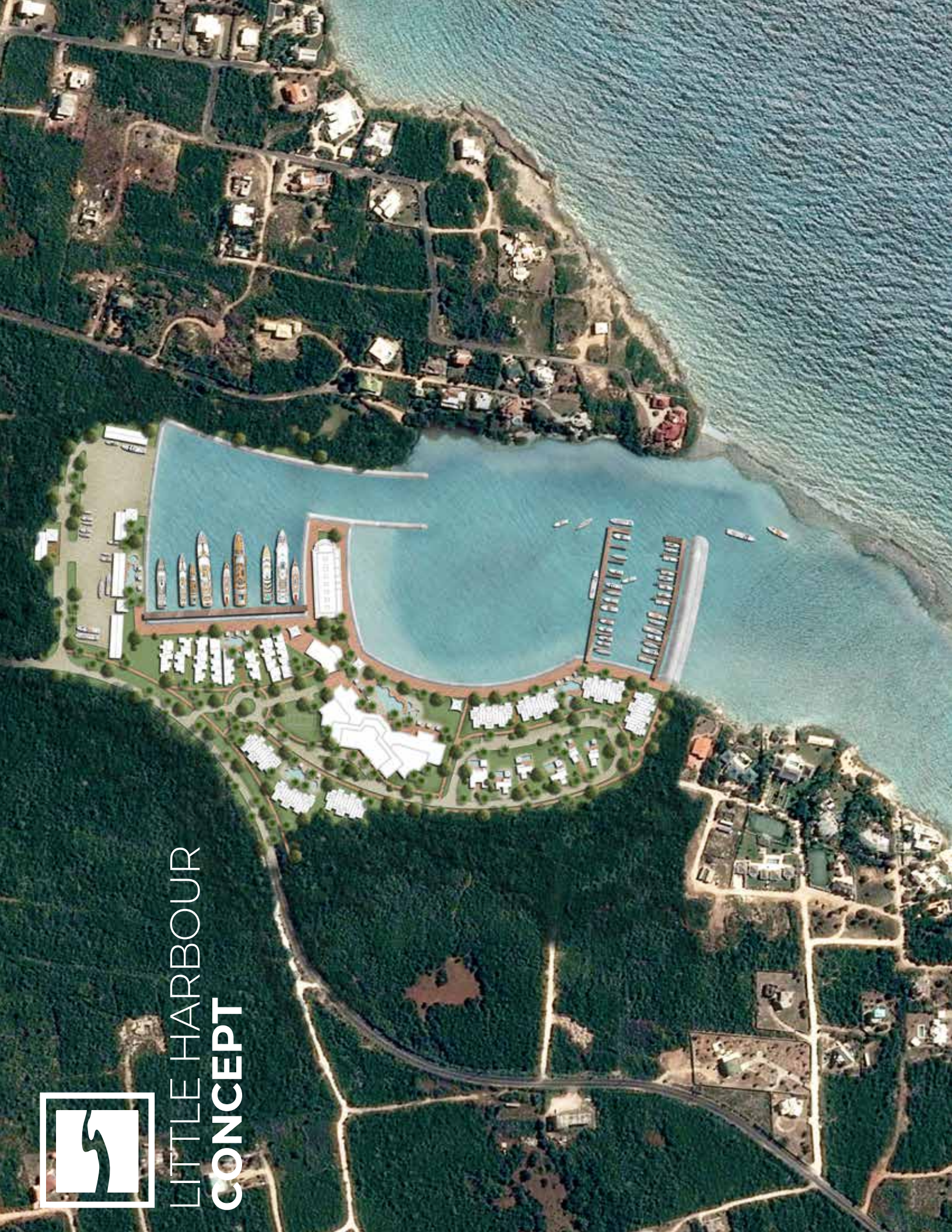


| SLIP MIX | | MED MOORING | | |
|-------------|-------|-------------|-------|-------|
| LENGTH | COUNT | LENGTH | COUNT | LF |
| 40' | 14 | 150" | 5 | 750 |
| 60' | 51 | 200" | 10 | 2,000 |
| 80" | 10 | | | |
| TOTAL SLIPS | 75 | | | |
| BROADSIDE | 980 | | | |
| TOTAL LF | 5,400 | TOTAL LF | | 2,750 |





LITTLE HARBOUR CONCEPT



VI. MARINA CONCEPTS

DEVELOPMENT ECONOMICS



ECONOMIC IMPACT OF YACHTS

The first economic impacts of a mega yacht’s activity begin with the infusion of “outside” dollars into the region. These dollars come from two primary sources: Expenditures for construction, maintenance, repair, and refitting, of mega yachts. Expenditures by mega yachts for dockage, fuel, and consumables. Beyond these most obvious sectors, vessel expenditures flow much more broadly throughout the regional economy, generating economic value and impact along the way. Past studies have completed the partial estimation of mega yacht economic impacts. The figure below details the average spending of one 36 meter (120 foot) megayacht annually in USD based upon published information using the IMPLAN model¹ as well as a 300’ megayacht based on data collected from industry experts.

| 120' Boat Used in IMPLAN Model | 120' YACHT | 300' YACHT | |
|--------------------------------|--------------------|-----------------------|---|
| Cost Category | Cost (\$) | Cost (\$) | IMPLAN Sector |
| Boatyard Expense | \$390,979 | \$1,876,699.20 | 364 Boat building |
| Boat Supplies | \$113,637 | \$545,457.60 | 395 Wholesale trade |
| Repair & Maintenance | \$155,934 | \$748,483.20 | 364 Boat building |
| Fuel & Oil | \$82,049 | \$393,835.20 | 402 Retail Gasoline stores |
| Vessel Insurance | \$86,937 | \$417,297.60 | 438 Insurance agencies, brokerages, and related activities |
| Temporary Help | \$45,148 | \$216,710.40 | 464 Employment services |
| Dockage | \$60,881 | \$292,228.80 | 496 Other amusement and recreation industries |
| Capital Equipment | \$45,772 | \$219,705.60 | 315 Search, detection, and navigation instruments manufacturing |
| Gross Salaries | \$619,591 | \$2,974,036.80 | 414 Scenic and sightseeing transportation and support activities for transportation |
| Other Fees & Owner Expenses | \$89,243 | \$428,366.40 | 414 Scenic and sightseeing transportation and support activities for transportation |
| Food Crew, et. al. | \$185,766 | \$891,676.80 | 400 Retail Food and beverage stores |
| Communications | \$53,689 | \$257,707.20 | 428 Wireless telecommunications carriers (except satellite) |
| Captains Petty Cash | \$44,328 | \$212,774.40 | 414 Scenic and sightseeing transportation and support activities for transportation |
| Transportation | \$48,410 | \$232,368.00 | 412 Transit and ground passenger transportation |
| Uniforms & Laundry | \$29,992 | \$143,961.60 | 511 Dry Cleaning and Laundry Services |
| Crew Insurance | \$13,622 | \$65,385.60 | 438 Insurance agencies, brokerages, and related activities |
| Flower Expense | \$12,649 | \$60,715.20 | 406 Retail Misc Retailers |
| Entertainment | \$4,452 | \$21,369.60 | 404 Retail Sporting goods, hobby, musical instrument and book |
| Total Expenses | \$2,083,079 | \$9,998,779.20 | |

¹ Many economic impact studies use information from the Regional Inter-Industry Impact Model – (IMPLAN). This model was developed using a combination of direct survey data obtained through national surveys of inter-industry interaction, and then, “shares down” the inter-industry relationships to the local or regional level, based upon the structure or employment structure of industries in the state or region. The IMPLAN model used herein includes industry linkages specific to Broward, Miami-Dade, and Palm Beach Counties.



ECONOMIC IMPACT OF YACHTS ²

\$2M

ANNUAL SPENDING

A median sized megayacht spends over \$2,00,000 annually, generating economic impacts across hundreds of business types.

+11

DIRECT JOB CREATION

A median size megayacht directly supports 11 full-time jobs.

\$2M

LABOR INCOME

A median sized megayacht generates over \$2,000,000 annually in labor income for full-time employees and indirect transactions.

+41

TOTAL JOB CREATION

One median sized megayacht creates 11 direct, 6 indirect, and 24 induced jobs.

\$5.8M

TOTAL IMPACT

A single megayacht vessel adds nearly six million dollars into the economy on a state level and generates hundreds of thousands in taxes.

+899

POTENTIAL IMPACT

- BASED ON THE ESTIMATED FINANCIAL INPUTS OUTLINE ON THE NEXT PAGE "FINANCIAL PROJECTIONS" OUTLINE THE PROJECTED ECONOMIC GROWTH GENERATED BY THE MARINA PROJECTS ACROSS THREE STAGES OVER TEN YEARS. THIS IS A CONSERVATIVE ESTIMATE OF OPERATING REVENUES.

- USING THE ECONOMIC IMPACT MODEL OF THE UNIVERSITY OF FLORIDA, WE CAN TRACK HOW THE ECONOMIC GROWTH CAN IMPACT AN ECONOMY, MAINLY: JOB CREATION. BASED ON THE ECONOMIC IMPACT OF THE MASTER PLAN FINANCIAL PROJECTIONS, 899 NEW JOBS COULD BE CREATED FOR THE ANGUILLAN ECONOMY.



² Industry averages data is based on the Southern region of Florida where the most recent findings have been published in MEGA YACHTS IN SOUTH FLORIDA TRENDS, IMPACTS & ISSUES. Given the mobility of megayachts and the competition that spans states and countries, it is realistic to hold these inputs constant for analysis in Anguilla markets.

