



MAJOR WATER PERMIT APPLICATION

Environmental Assessment Report

Applicant: Trans Americas Fiber (TAF) U.S., LLC.

Project: Magen's Bay, St. Thomas USVI Trans-Caribbean Fiber System Cable Landing Project

December 2023

Prepared by: Tysam Tech, LLC



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1.00 NAME AND ADDRESS OF APPLICANT

Trans Americas Fiber (TAF) U.S., LLC.

Mailing Address:

2100 Ponce de Leon Blvd., Suite 1172
Coral Gables, Florida 33134

Physical Address:

2100 Ponce de Leon Blvd., Suite 1172
Coral Gables, Florida 33134

2.00 LOCATION OF PROJECT

The project is located at the following physical address:

**Magen's Bay Cable Station
No. 1, 2, 3, 4, 5 & 6 Estate Peterborg, Northside
St. Thomas, VI 00801**

The Landing Site Permitting for the Trans-Caribbean Fiber System, Magen's Bay, St. Thomas project is located in northern St. Thomas, on the north coast of Magen's Bay. The landing site is positioned 18°22'19.7"N 64°55'42.5"W, while the cable station is located at 18°22'26.0"N 64°55'40.4"W. Sections 2.01 and 2.02 include Location and Agency Review Maps and Vicinity Maps, respectively.

2.01 Location and Agency Review Map

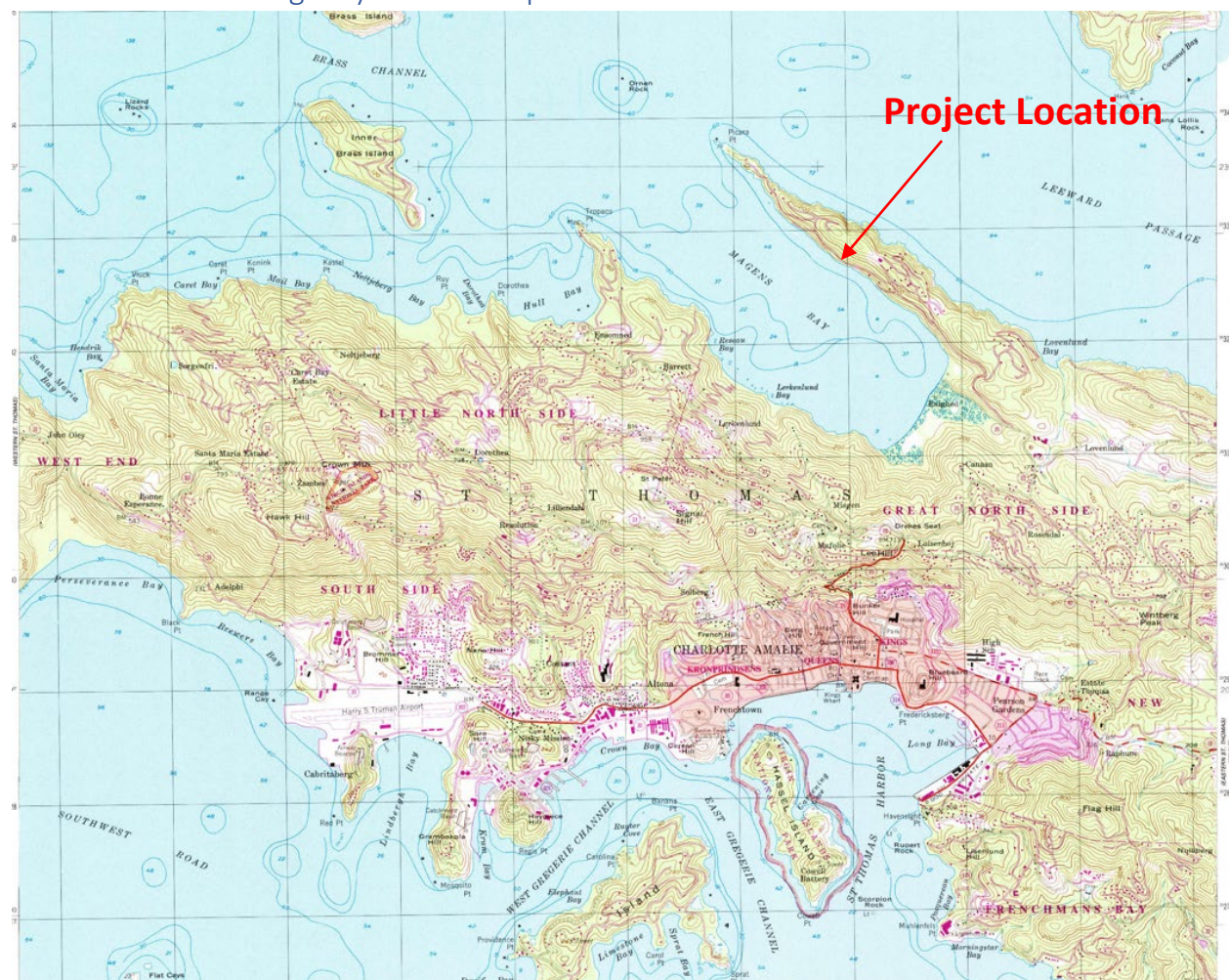


Figure 2.01.1 – Location and Agency Review Map (USGS Quadangle Map, Central St. Thomas, VI, 1955, 1987 ed.)

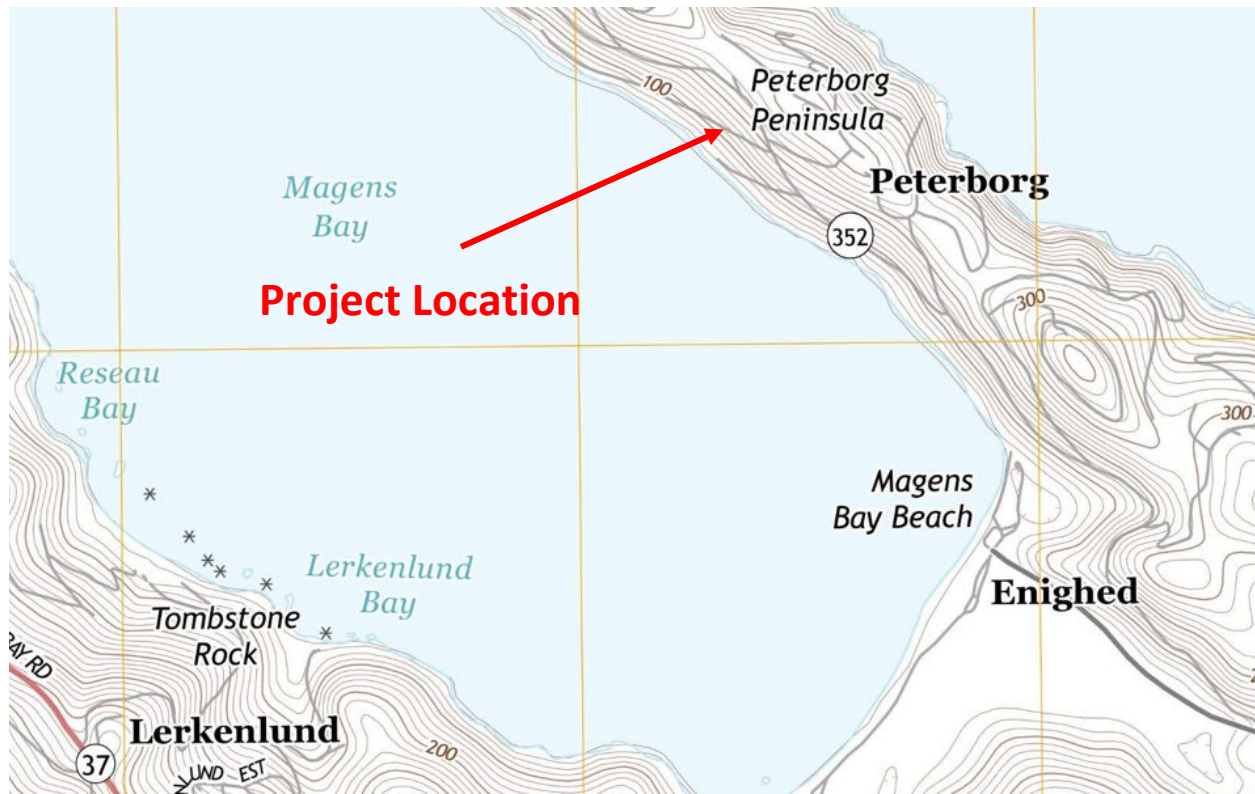


Figure 2.01.2 – Location and Agency Review Map (USGS Quadrangle Map, Charlotte Amalie, VI, 2013)

2.02 Vicinity Map



Figure 2.02.1 – Vicinity Map (Google Earth, 2023)



Figure 2.02.2 – Vicinity Map (MapGeo, Aerial 2020)

3.00 ABSTRACT

This project seeks to install an armored telecommunication fiber optics cable at Magen's Bay, St. Thomas USVI as part of a major Trans-Caribbean Fiber System venture to improve capacity and connectivity between the continental United States of America and the Caribbean. Of an approximate 4,393-kilometer cable system delineated across numerous segments, the primary branch of this cable system, spanning 2,166 kilometers, will connect between Vero Beach, FL and Butler Bay, St. Croix. The primary Florida-to-St. Croix, TCFS trunk segment will have five (5) branching unit (BU) segments, one of which will make landfall at Magen's Bay, St. Thomas, USVI. This branch will begin 93.5 kilometers from the St. Croix landing site, extend to the Magen's Bay landing site over a route that spans 23 kilometers. The cable will be surfaced laid and enter a landing manhole installed at the shoreline transition point at Magen's Bay and connect via existing underground conduit to the AT&T of the Virgin Islands distribution building located at No. 1, 2, 3, 4, 5 & 6 Estate Peterborg, Northside St. Thomas, VI 00801.

Cable design and type were developed in the planning stages based on engineering considerations identified during the route planning process. The landings were selected to optimize the approach to existing infrastructure, minimize interference with existing cables, and use existing infrastructure where available to install new cable, minimizing environmental impact and maximizing the protection and projected life of the cables.

An important component of the route planning process is the minimization of impacts to the marine environment within the Waters of the USVI, particularly coral reefs and other benthic habitat. Deepwater marine route segment surveys were conducted along the cable route to the approach and entry into the USVI Waters, in conjunction with concurrent benthic habitat surveys of the shallow and medium-depth waters from the edge of USVI Waters to shoreline transition points.

The submarine fiber optic cable is proposed to be laid on the seafloor coming from the west from deep water at a north/south cable intersection 0.75 nautical miles west of the USVI Waters territorial boundary. The cable runs east passing approximately one nautical mile north of Cricket Rock onward to a point approximately 0.7 nautical miles north of Outer Brass. From there, it continues east to a point roughly one nautical mile northeast of Outer Brass where it runs south-southeast into the shallow waters of Magen's Bay.

There are no existing bores at the proposed Magen's Bay landing site. The St. Thomas landing will require cable to be surface pinned and then ploughed to the land side of the Mean High Tide Line (MHTL). A manhole will be installed at the shoreline where it will be used to transition the cable to existing conduit buried in established easements. The proposed fiber optic cable will be winched through existing conduit running through a property easement to a manhole located on the subject property of AT&T of the Virgin Islands and connected to existing infrastructure at this location. The cable will be anchored and/or pinned to the seafloor.

Where new infrastructure is needed, disruption of the shoreline and shallow water seafloor will be minimized by using the seafloor features that effectively function as a natural corridor for the cable route (e.g. optimizing use of flat seabed, avoiding slopes, side-slopes and hard bottom areas where possible) as well as employing minimally impacting installation methods.

Benthic surveys of this area were conducted November 18-20, 2022 as well as November 6, 2023 to identify and quantify the presence/absence of specific marine habitats, to include but not be limited to coral reef structures (both mesophotic and shallow-water), seagrasses, hardbottom, and fisheries habitat that may be impacted by the installation of the cable. Particular attention was paid to areas near land that may have connected or associated hard-bottom habitats that could support these deep reefs and the proposed route was videotaped using a drop camera, ROV and/or diver held camera.

Randomly selected sections on and near the proposed route were sampled with a drop camera to look for any possible significant benthic habitat. The benthic community was a uniform fine sand/silt for the entire route except for a short stretch of approximately 0.5km east of the north end of Outer Brass Island in 70-foot-deep water and approximately 0.08 km near the shore landing site within Magen's Bay.

In the ROV video footage from the same area an existing cable is plainly visible with no observed disturbance of benthic habitats as with other existing cables found elsewhere, some on the reef and some well off the bottom. No evidence of habitat degradation was observed. The reef documented at approximately 200' to 300' from shore is a mixed bottom with various habitats and benthic life, including hard corals of various species so attention will be paid as to not disturb this area during installation.

Based on the proposed route, no observable long-term impact of existing cable infrastructure on top of various types of seafloor, and the method of installation of the proposed cable, this project is anticipated to have minimal impact during temporary construction activities as well as long-term presence and operation, while providing a significant benefit to the island of St. Thomas.

Anticipated start date of this project is May 2024.

Project Assurances

- Employees' and the public's health and safety are protected with the best available systems and technologies.
- Environmental impact is considered at all times.
- No significant negative impact to environment.
- Air quality is protected.
- Stormwater quality is protected.
- Nearshore water quality is protected.

4.00 STATEMENT OF OBJECTIVES SOUGHT BY THE PROPOSED PROJECT

The objectives of this proposed project are to improve connectivity, reliability, and accessibility of telecommunications and network services in St. Thomas, USVI. The cable route and design were developed in the planning stages based on engineering considerations identified during the route planning process. Landings were selected to optimize the approach to existing infrastructure, to minimize interference with existing cables, and use existing infrastructure where available to install the new cable, thereby minimizing environmental impact.

5.00 DESCRIPTION OF PROJECT

5.01 Summary of Proposed Activity/Proposed Dates of Construction

a. Purpose of Project

The purpose of the project is to increase telecommunication strength, reliability, bandwidth and help minimize the risk of communications disruption by providing cable route diversity and alternative bandwidth access to existing cables in the Atlantic-Caribbean region.

b. Presence and Location of any Critical Area(s) and Possible Trouble Spots

The terrestrial portion of the project is in the narrow portion of land to the north of Magen's Bay, in Estate Peterborg. This is a residential area designated R-1 (Low Density) and has approximately 50-65% development of lots. The entire area has thick vegetation separating the properties, with the majority of vegetation being brush, with minimal grassy areas. An existing AT&T distribution building on the property houses all the necessary infrastructure to connect the proposed cable to active network systems on the island.

Slope is between 20 and 60 percent with elevation varying from 280 feet above sea level at the building manholes to the landing site at sea level. Existing conduit in the easement running from the building down to the proposed landing site will be used to route the new cable from the shoreline. A manhole connection terminal will be installed at the shoreline, in order to anchor the endpoint of the submarine cable as it is routed below ground up past the MHTL.

Magen's Bay and its surrounding area have been classified as particularly sensitive relating to marine resources and habitats, having been classified as an Area of Particular Concern (APC) as well as a Marine Protected Area (MPA) since 1993 and in subsequent evaluations as recently as the 2020-2025 United States Virgin Islands' Coral Reef Management Priorities, having been ranked within the top 10 areas most suitable for protection and management intervention for its coral reefs.

Magen's Bay has also been previously classified as an Area of Particular Concern (APC) due to it being listed on NOAA's National Marine Protected Areas. The Magen's Bay APC is located on the north central side of the island of St. Thomas. This APC is bound by Tropaco Point in the west, the entire Peterborg peninsula in the east, and has a seaward boundary that extends directly north to the shelf edge or three-nautical mile territorial limit (whichever is closer). Valuable resources within this area include primary archaeological sites, several types of forest, fish nursery habitats, and 8 endangered species (U.S. Marine Managed Areas Inventory (2006a), NOAA's National Marine Protected Areas Center).

The Environmental Sensitivity Index (ESI) Map indicates presence of fish, octopus, gastropods (i.e., conch), lobster, dolphin and whale in nearshore as well as shelf waters closer to Outer Brass Island and the proposed cable route. Of the whale species, the humpback whale is considered federally endangered and breeding grounds are indicated to be near these waters around the months of November to May. The map also indicates that the inner Magen's Bay beach to be an area for turtle nesting, particularly in January and December, and a breeding ground for a variety of marine and terrestrial species including crab, waterfowl, wading birds, seabirds, and shorebirds. Of the bird species, three are considered endangered: the Caribbean Coot (*Fulica caribaea*), ruddy duck (*Oxyura jamaicensis*), and white-cheeked pintail (*Anas bahamensis*) all of which breeds and nests year-round. In addition, two plant species considered endangered: the *Manilkara bidentata* and the *Tillandsia lineatispica*, were noted on the ESI near the vicinity of the project area.

A review of Endangered Species in the area, using the U.S. Fish & Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) Tool, indicates there are three endangered species within the proposed project area and four that are considered threatened. The two federal endangered sea turtle species that are known to swim in the offshore waters are the Hawksbill Sea Turtle (*Eretmochelys imbricata*) and Leatherback Sea Turtle (*Dermochelys coriacea*) along with the threatened species Green Sea Turtle (*Chelonia mydas*), Loggerhead Sea Turtle (*Caretta caretta*), and the Olive Ridley Sea Turtle (*Lepidochelys olivacea*). The Virgin Islands Tree Boa (*Chilabothrus granti*) is also an endangered species of reptile in the area. In addition, the West Indian Manatee (*Trichechus manatus*) has also been found in the offshore waters and are a threatened species.

Benthic surveys of the proposed cable route were conducted November 18-20, 2022 to identify and quantify the presence/absence of marine habitats, to include but not be limited to coral reef structures (both mesophotic and shallow-water), seagrasses, hardbottom, and fisheries habitat that may be impacted by the installation of the cable. Particular attention was paid to areas near land that may have connected or associated hard-bottom habitats that could support these deep reefs.

The benthic community was a uniform fine sand/silt for the entire route except for a short stretch of approximately 0.5km east of the north end of Outer Brass Island in 70-foot-deep water and approximately 0.08 km near the shore landing site within Magen's Bay. Those sections are noted in the attached Overview Map of the proposed cable route.

In the 70-foot-deep reef discovered, an existing cable is plainly visible with no observed disturbance of benthic habitats as with other existing cables found elsewhere, some on the reef and some well off the bottom. No evidence of habitat degradation was observed anywhere near existing cables. The reef documented at approximately 200' to 300' from shore is a mixed bottom with various habitats and benthic life, including hard corals of various species so attention must be paid as to not disturb this area during installation.

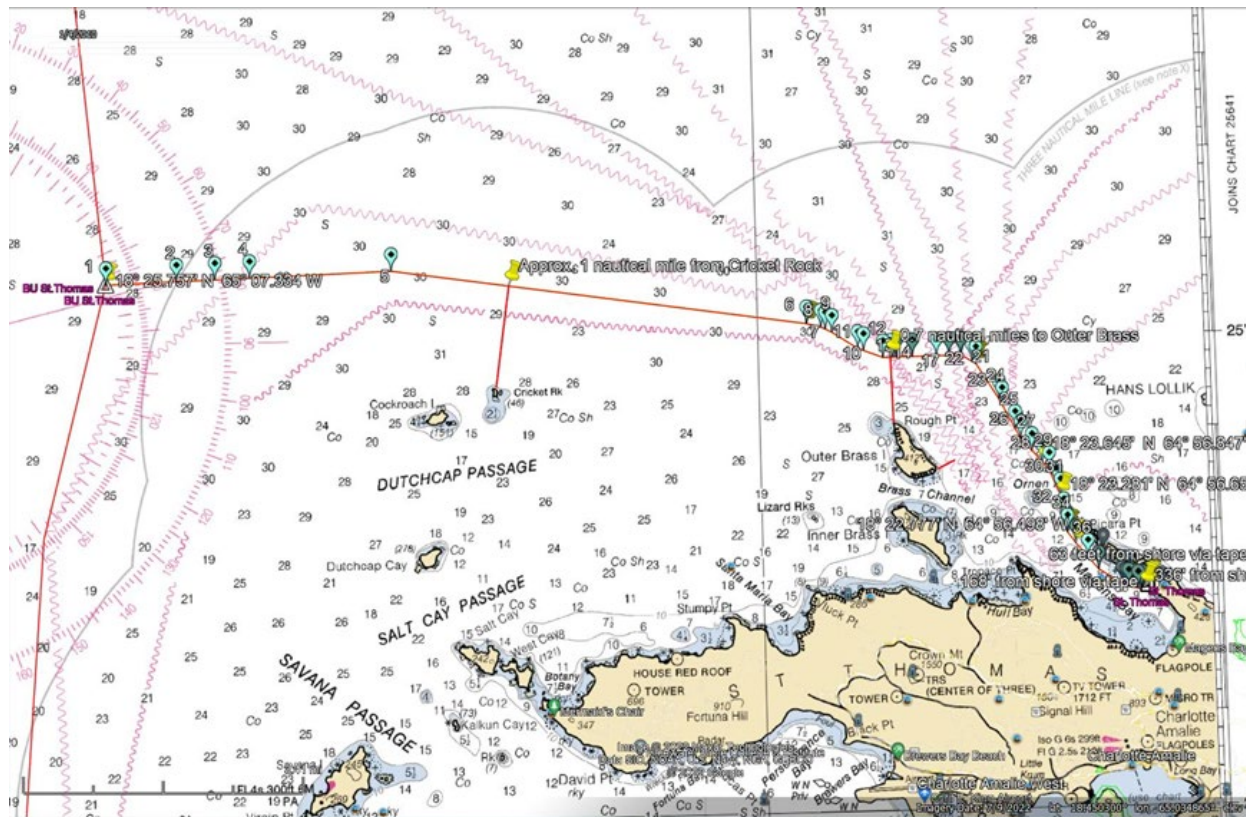


Figure 5.01.1 – NOAA chart overlay on Google Earth Image showing proposed cable route and the numerous existing cables identified by oscillating red lines.

c. Proposed Method of Construction

A specialized transmission cable vessel will lay cable through the majority of the deep-water segments of the full TCFS route, with the assistance of sonar, GPS, and ROVs. As it enters the 3 nm boundary of USVI Waters, the cable placement will transition to small vessel, placing and floating the cable into place with the use of ROVs and eventually divers. The proposed fiber cable will be laid until it reaches the available existing AT&T landing site, where it will be installed under the surface to a shoreline manhole transition structure, with diver assist and small vessel monitoring. The proposed fiber optic cable will be winched through existing conduit running through a property easement to a manhole located on the subject property of AT&T of the Virgin Islands and connected to existing infrastructure at this location. The cable will be anchored and/or pinned to the seafloor where hardbottom exists, estimated to be approximately 2.4% of the entire route in USVI Waters.

d. Provisions to Limit Site Disturbance

As the project involves work in and adjacent to the water line, site disturbance will be minimized and carefully performed, where required. In order to limit site disturbance, the proposed work timeline will be the minimum time required to perform each task to avoid unnecessary disturbance to surrounding areas. The project will stay almost exclusively within the footprint of existing infrastructure.

On the landside of the installation activities, no earth change, digging, vegetation or structure removal is required.

In-water work will require no directional drilling, but some digging, ploughing and installation of cable underground to a shoreline manhole will be required. Use of turbidity curtains and simple trenching methods will ensure minimal site disturbance both in water and at the shoreline.

Any disturbance to the seafloor due to placement activities will be monitored at all times and a Water Quality Plan will be implemented during any in-water activities. After each stage of site disturbance, stabilization and scour protection will be implemented immediately.

Where stabilization, pinning or anchoring of the cable is required, these activities will be done by divers and in a manner that minimizes potential sediment or sand plumes in the water.

e. Erosion and Sedimentation Control Methods to be Implemented

The following Best Management Practices (BMPs) will be implemented on the site to control runoff and protect natural resources:

Turbidity Curtain – Due to the work performed within the waterbody, a turbidity curtain will be used to minimize sedimentation during project implementation. These curtains are flexible, impermeable barriers which are weighted at the bottom to ensure that sediment does not travel underneath and are supported at the top through a flotation system.

The design of these BMPs will follow the minimum standards of the VI Environmental Protection Handbook (2002).

f. Schedule for Construction Activities and Implementation of Sediment Control Measures

Approach and installation of the cable is anticipated to begin by September 2023 and be completed by September 2024.

An important component of the route planning process is the minimization of impacts to the environment, particularly coral reefs.

The submarine fiber optic cable is proposed to be laid on the seafloor coming from the west from deep water at a north/south cable intersection 0.75 nautical miles west of the USVI Waters territorial boundary. The cable runs east passing approximately one nautical mile north of Cricket Rock onward to a point approximately 0.7 nautical miles north of Outer Brass. From there, it continues east to a point roughly one nautical mile northeast of Outer Brass where it runs south-southeast into the shallow waters of Magen's Bay.

The route was mapped by 55 GPS points starting at the intersection with the north/south cable (GPS point 1) and ending on land with GPS Point 55.

There are no existing bores at the proposed Magen's Bay landing site. The St. Thomas landing will require cable to be surface pinned and then ploughed to the land side of the Mean High Tide Line (MHTL). A

manhole will be installed at the shoreline where it will be used to transition the cable to existing conduit buried in established easements.

Where new infrastructure is needed, disruption of the shoreline and shallow water seafloor will be minimized by using the seafloor features that effectively function as a natural corridor for the cable route (e.g. optimizing use of flat sea bed, avoiding slopes, side-slopes and hard bottom areas where possible) as well as employing minimally impacting installation methods.

Turbidity curtains will be installed around cable landing activity as it approaches shallow water and the shoreline. As placement of cable will be done with the aid of divers in shallow water, adjustment to the turbidity curtains will be made as needed through constant communication between in-water crew and boat/shoreline observers.

g. Maintenance of Sediment and Siltation Control Measures

Turbidity curtains will be inspected daily during in-water work, with additional monitoring of performance during storms or inclement weather events. Any visible plume of sediment in water passing beyond the curtain from the project area will constitute inadequate performance of the curtain and require cessation of work until the faulty portion of the curtain can be modified, adjusted, or repaired to correct the inadequacy.

The site will be kept clear of litter, debris and materials such as paper, wood, concrete, etc. to prevent trash or construction material entering the water.

h. Method of Stormwater Management

No changes to topography, slope, land cover or use is proposed for this project, and no earth change is proposed for the shore-side portion of this project. As a result, there are no anticipated controls needed for stormwater control or pollution prevention.

i. Maintenance Schedule for Stormwater Facilities

No stormwater facilities existing at the site will be modified or obstructed, and no new stormwater structures or facilities are proposed for this project.

j. Maintenance of Sediment and Siltation Control Measures

No changes to topography, slope, land cover or use is proposed for this project, and no earth change is proposed for the shore-side portion of this project. As a result, there are no anticipated controls needed for stormwater control or pollution prevention and no anticipated maintenance requirements.

5.02 Exhibits and Drawings

5.02.01 Lot Layout (See Attached: Engineer/Surveyor drawings)

5.02.02 Position of Structures (See Attached: Engineer/Surveyor drawings)

5.02.03 Other Required Drawings (See Attached: Engineer/Surveyor drawings)

5.02.04 Required Maps (See Attached: Official Zoning Map, Parcel Map, FIRM)

5.03 Project Workplan

This project seeks to install an armored telecommunication fiber optics cable at Magen's Bay, St. Thomas USVI as part of a major Trans-Caribbean Fiber System venture to improve capacity and connectivity between the continental United States of America and the Caribbean. Of an approximate 4,393-kilometer cable system delineated across numerous segments, the primary branch of this cable system, spanning 2,166 kilometers, will connect between Vero Beach, FL and Butler Bay, St. Croix. The primary Florida-to-St. Croix, TCFS trunk segment will have five (5) branching unit (BU) segments, one of which will make landfall at Magen's Bay, St. Thomas, USVI. This branch will begin 93.5 kilometers from the St. Croix landing site, extend to the Magen's Bay landing site over a route that spans 23 kilometers.

The cable will be surfaced laid and enter a landing manhole installed at the shoreline transition point at Magen's Bay and connect via existing underground conduit to the AT&T of the Virgin Islands distribution building located at No. 1, 2, 3, 4, 5 & 6 Estate Peterborg, Northside St. Thomas, VI 00801.

The submarine fiber optic cable is proposed to be laid on the seafloor coming from the west from deep water at a north/south cable intersection 0.75 nautical miles west of the USVI Waters territorial boundary. The cable runs east passing approximately one nautical mile north of Cricket Rock onward to a point approximately 0.7 nautical miles north of Outer Brass. From there, it continues east to a point roughly one nautical mile northeast of Outer Brass where it runs south-southeast into the shallow waters of Magen's Bay.

As the depth gets shallower, the cable placement will transition to small vessel, placing and floating the cable into place with the use of ROVs and eventually divers guiding placement. The cable for the entire branch to St. Thomas will be comprised of Double Armor (DA) cable.

There are no existing bores at the proposed Magen's Bay landing site. The St. Thomas landing will require cable to be surface pinned and then ploughed to the land side of the Mean High Tide Line (MHTL). A manhole will be installed at the shoreline where it will be used to transition the cable to existing conduit buried in established easements. The proposed fiber optic cable will be winched through existing conduit running through a property easement to a manhole located on the subject property of AT&T of the Virgin Islands and connected to existing infrastructure at this location. The cable will be anchored and/or pinned to the seafloor.

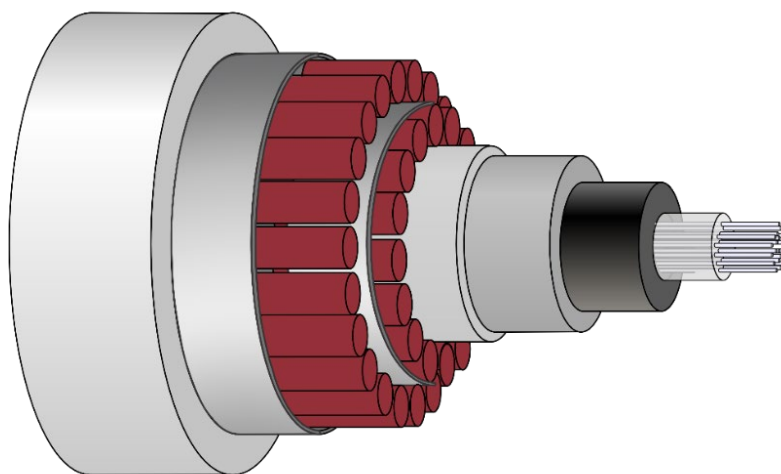


Figure 5.03.1 – Typical Cross-Section of Double Armored Telecommunication line

Table 5.03.1 below provides a summary of the cable route information, including key Location Route Points/Locations, GPS markers, cable depths/distances between those markers and cable type. Table 6, 7, 8 and 9 show the cable distance between events.

Pos No.	Event	Latitude (North)	Longitude (West)	Bearing °T	Distance (km)		Slack %	Cable Distance (km)		Cable Type	Cable Totals By Type (km)	Approx Depth (m)
					Between Positions	Cumulative Total		Between Positions	Cumulative Total			
1	BU 4 St. Thomas	18 ° 25.894 ' N	65 ° 08.486 ' W			0.000			0.000		0.000	51
				266.70 °	1.466		1.00	1.481		DA		
2	AC001	18 ° 25.848 ' N	65 ° 07.655 ' W			1.466			1.481			52
				258.48 °	1.194		1.00	1.206		DA		
3	AC002	18 ° 25.718 ' N	65 ° 06.990 ' W			2.660			2.687			51
				244.19 °	0.709		1.00	0.716		DA		
4	AC003	18 ° 25.551 ' N	65 ° 06.628 ' W			3.369			3.403			52
				236.18 °	1.271		1.00	1.284		DA		
5	AC004	18 ° 25.168 ' N	65 ° 06.028 ' W			4.640			4.686			52
				255.70 °	0.469		1.00	0.473		DA		
6	AC005	18 ° 25.105 ' N	65 ° 05.770 ' W			5.109			5.160			53
				275.70 °	0.518		1.00	0.523		DA		
7	AC006	18 ° 25.133 ' N	65 ° 05.477 ' W			5.627			5.683			53
				288.13 °	0.620		1.00	0.626		DA		
8	AC007	18 ° 25.237 ' N	65 ° 05.143 ' W			6.247			6.309			53
				298.95 °	1.754		1.00	1.771		DA		
9	AC008	18 ° 25.698 ' N	65 ° 04.271 ' W			8.001			8.081			55
				286.16 °	0.601		1.00	0.607		DA		
10	AC009	18 ° 25.788 ' N	65 ° 03.944 ' W			8.601			8.687			55
				268.70 °	0.565		1.00	0.570		DA		
11	AC010	18 ° 25.781 ' N	65 ° 03.623 ' W			9.166			9.258			55
				261.33 °	7.426		1.00	7.500		DA		
12	AC011	18 ° 25.175 ' N	64 ° 59.454 ' W			16.592			16.758			55
				248.88 °	0.650		1.00	0.657		DA		
13	AC012	18 ° 25.048 ' N	64 ° 59.109 ' W			17.242			17.415			54
				235.69 °	0.588		1.00	0.594		DA		
14	AC013	18 ° 24.868 ' N	64 ° 58.833 ' W			17.831			18.009			54
				224.22 °	1.831		1.00	1.849		DA		
15	AC014	18 ° 24.157 ' N	64 ° 58.108 ' W			19.662			19.858			20
				210.39 °	3.325		1.00	3.358		DA		
16	Approximate BMH, St. Thomas	18 ° 22.602 ' N	64 ° 57.153 ' W			22.987			23.216		23.216	-4

Table 5.03.1 – Summary Cable Route Information

6.00 ECOLOGICAL SETTING AND PROBABLE PROJECT IMPACT ON THE NATURAL ENVIRONMENT

6.01 Climate & Weather

Prevailing Winds

The Virgin Islands lie in the "Easterlies" or "Trade Winds" that traverse the southern part of the "Bermuda High" pressure area. The predominant winds are usually from the east- northeast and east (IRF, 1977). These trade winds vary seasonally and are broadly divided into 4 seasonal modes: 1) December to February; 2) March to May; 3) June to August; and 4) September to November. Below are the characteristics of these modes as taken from Marine Environments of the Virgin Islands Technical Supplement No. 1 (IRF, 1977), and based on U.S. Naval Oceanographic Office data.

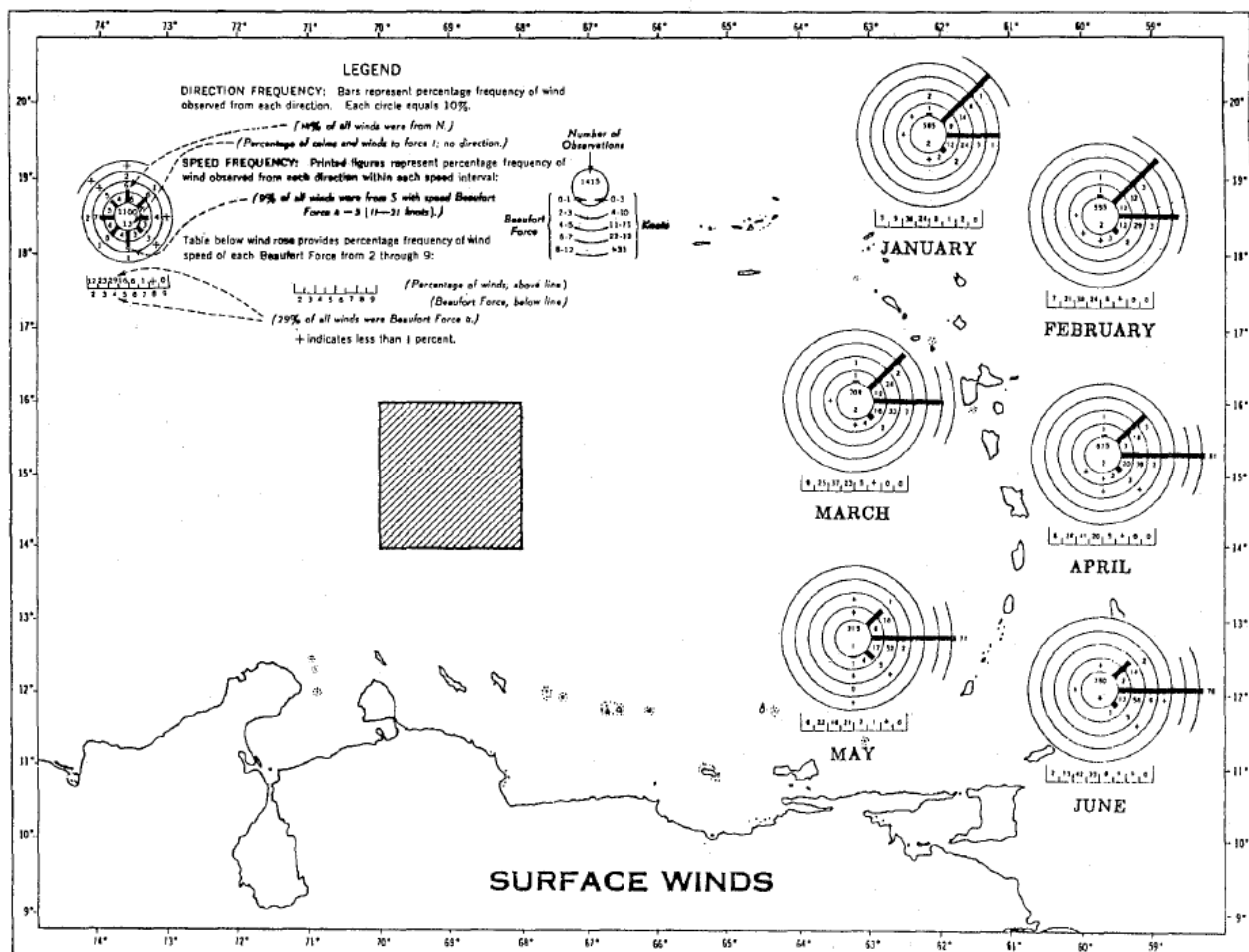


Figure 6.01.1 –Wind Direction and Speed Frequency, Central Caribbean, January - June. (IRF, 1977)

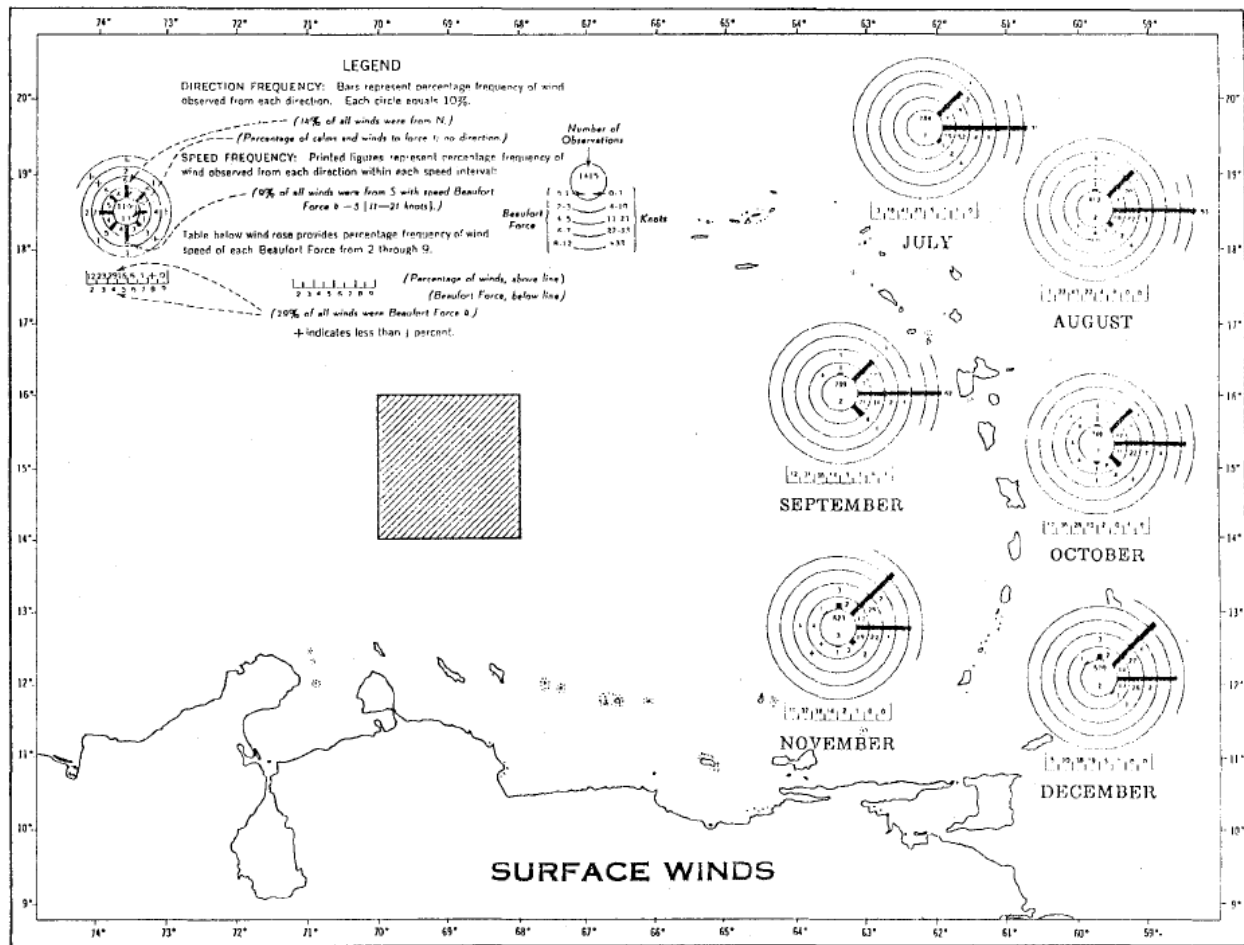


Figure 6.01.2 –Wind Direction and Speed Frequency, Central Caribbean, July - December. (IRF, 1977)

December – February

During the winter, the trade winds reach a maximum and blow with great regularity from the east-northeast. Wind speeds range from 11 to 21 knots about 60% of the time in January. This is a period when the Bermuda High is intensified with only nominal compensation pressure changes in the Equatorial Trough. The trade winds during this period are interrupted by “Northerners” or “Christmas Winds,” which blow more than twenty knots from a northerly direction in gusts from one to three days. Such outbreaks average about thirty each year. They are created by strengthening of high-pressure cells over the North American continent, which, in turn, allow weak cold fronts to move southeastward over the entire Caribbean region. These storms are accompanied by intermittent rains, clouds and low visibility.

March – May

During the spring, the trade winds are reduced in speed and blow mainly from the east. Winds exceed 20 knots only 13% of the time in April. The change in speed and direction is the result of a decrease of the Equatorial Trough.

June – August

Trade winds reach a secondary maximum during this period and blow predominantly from the east to east-southeast. Speeds exceed twenty knots 23% of the time during July. The trend for increasing winds results from the strengthening of the Bermuda High and a concurrent lowering of the pressure in the Equatorial Trough. Trade winds during this period are interrupted by occasional hurricanes.

September – November

During the fall, winds blow mainly from the east or southeast and speeds reach an annual minimum. Only 7% of the winds exceed 20 knots in October. The low speeds result from a decrease in the Equatorial Trough. During this period, especially during late August through mid-October, the normal trade wind regime is often broken down by easterly waves, tropical storms and hurricanes.

Storms and Hurricanes

There are numerous storm events each year, from squalls and thunderstorms to hurricanes. Standard rain events occur most frequently during the summer, lasting only a few hours and causing no pronounced change in the trade winds.

A tropical cyclone whose winds exceed 74 miles per hour is termed a hurricane in the northern hemisphere and can range in strength from causing little to no damage, to destroying. These hurricanes occur most frequently between August and mid-October with their peak activity occurring in September.

Figure 6.01.3 depicts NOAA data on historic Hurricanes and Tropical Storms in the vicinity of St. Thomas.

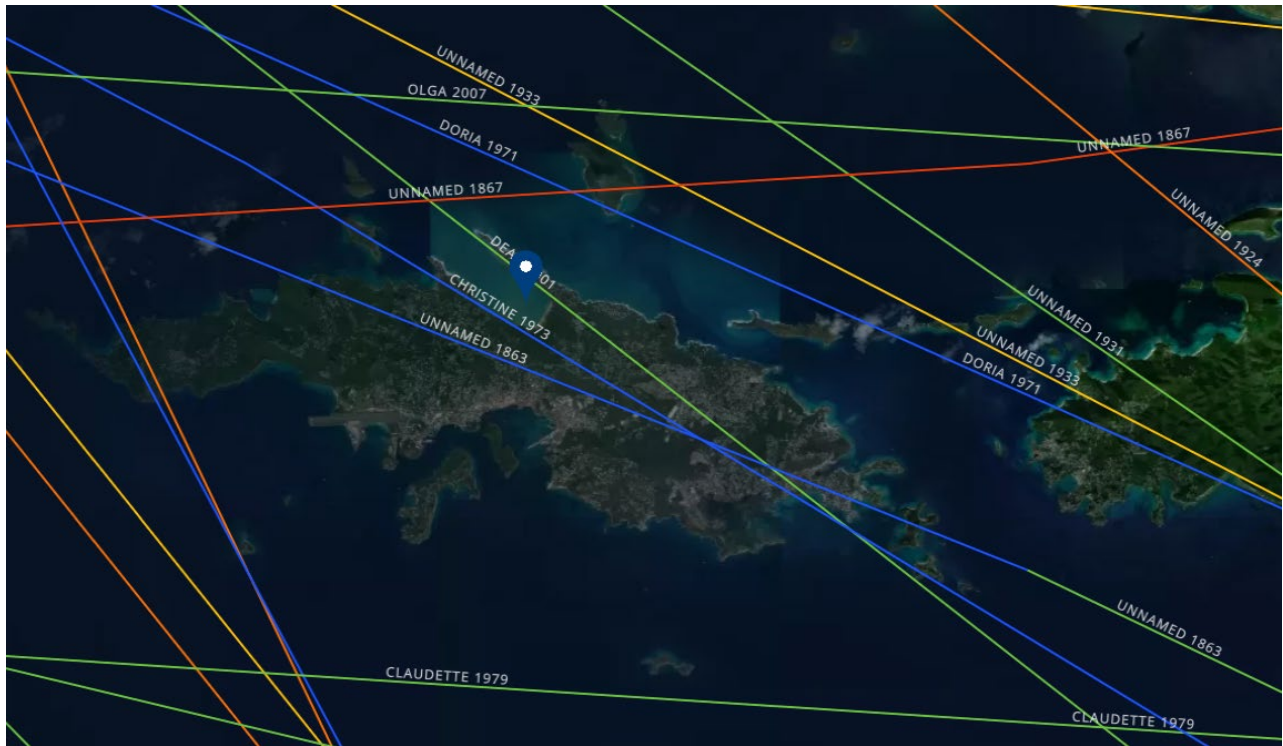


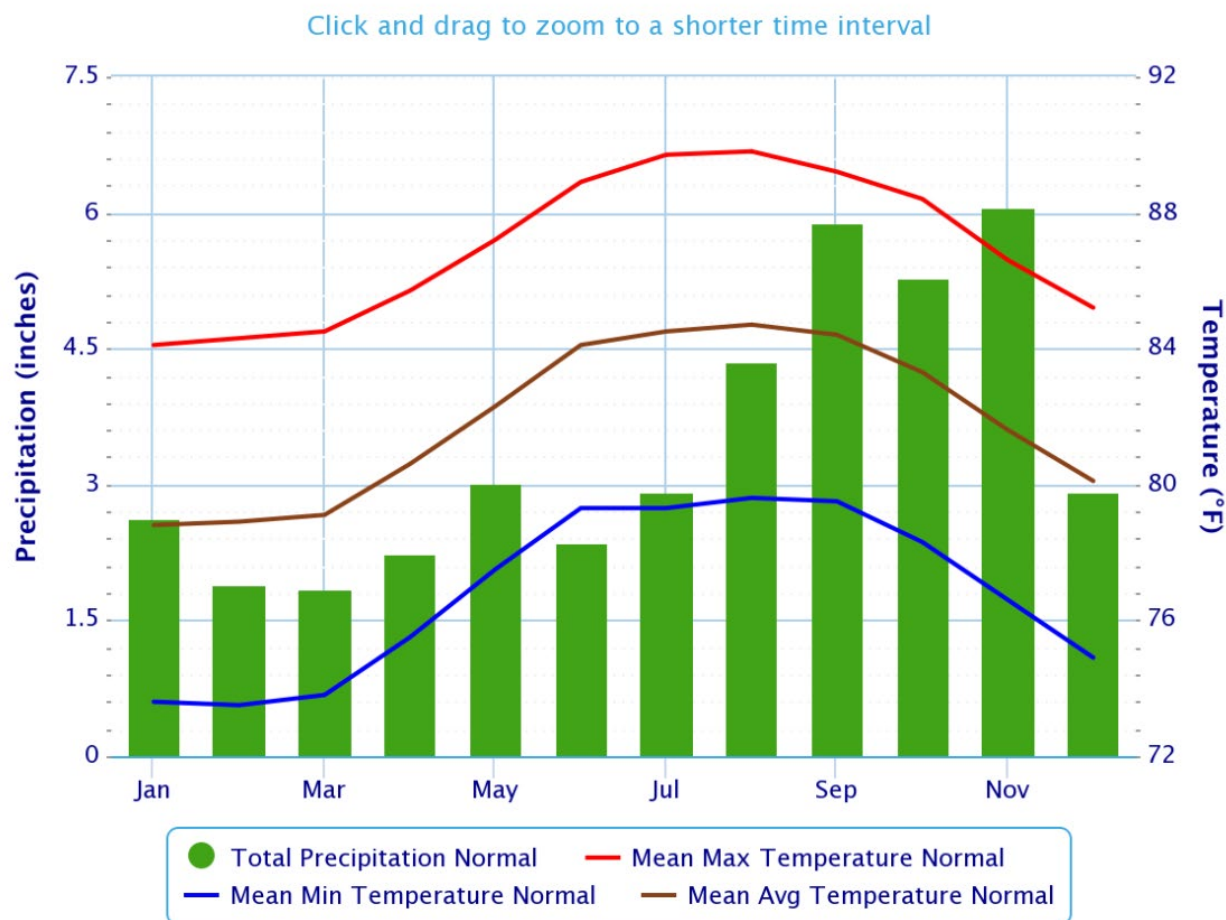
Figure 6.01.3 – Historic Tracks of Hurricanes and Tropical Storms for St. Thomas (NOAA)

Climate

The climate of St. Thomas, as well as that of the entire territory, is characterized by generally fair, tropical weather with usually consistent wind speed and direction. Temperature swings are narrow, both seasonally and diurnally.

The closest weather station to the facility that provides Monthly Climate Normals is Charlotte Amalie AP, Meteorological Station ID: VQW00011640 (a NOAA COOP Station). Climate data from this station is found below in Table 6.01.1.

Monthly Climate Normals (1991–2020) – CYRIL E. KING AIRPORT, VI



Powered by ACIS

Table 6.01.1 –Average Temperatures at Cyril E. King Airport (NOAA)

The nearest NOAA National Ocean Service Weather Station is located in Charlotte Amalie, St. Thomas, Station CHAV3 – 9751639. Climate data from this station is found in the tables below. Table 6.01.2 depicts the average wind speed (in knots) during each calendar month while Table 6.01.3 illustrates the peak wind gust (in knots) for each calendar month at the above-referenced weather station.

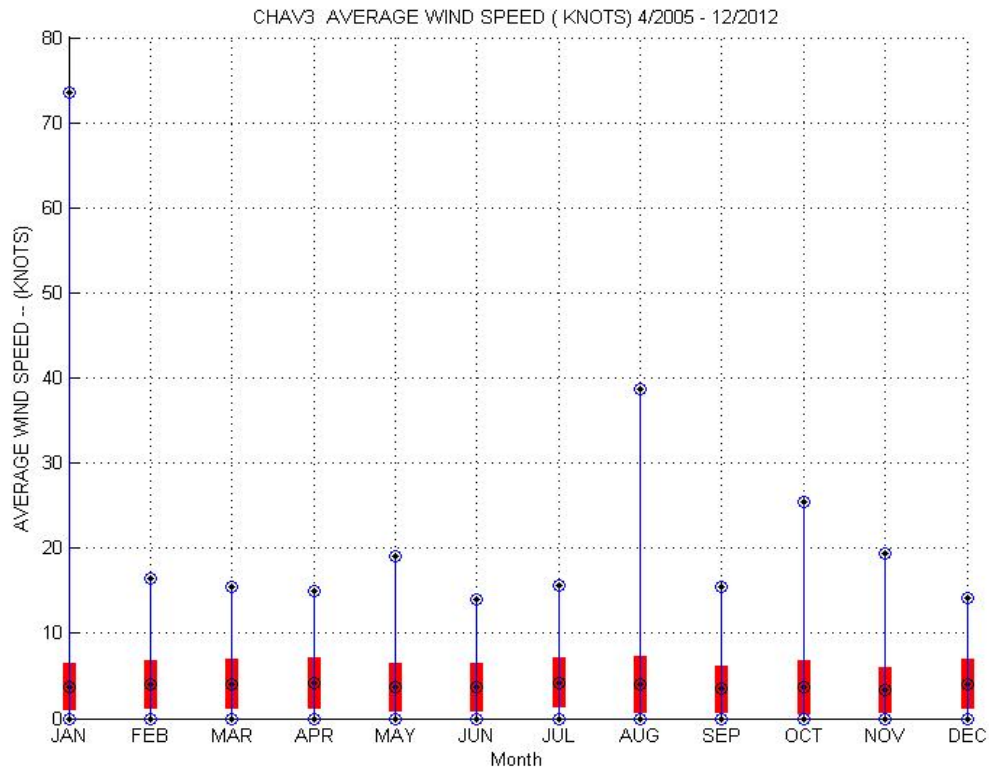


Table 6.01.2 – Average Wind Speed – Charlotte Amalie, St. Thomas (NOAA)

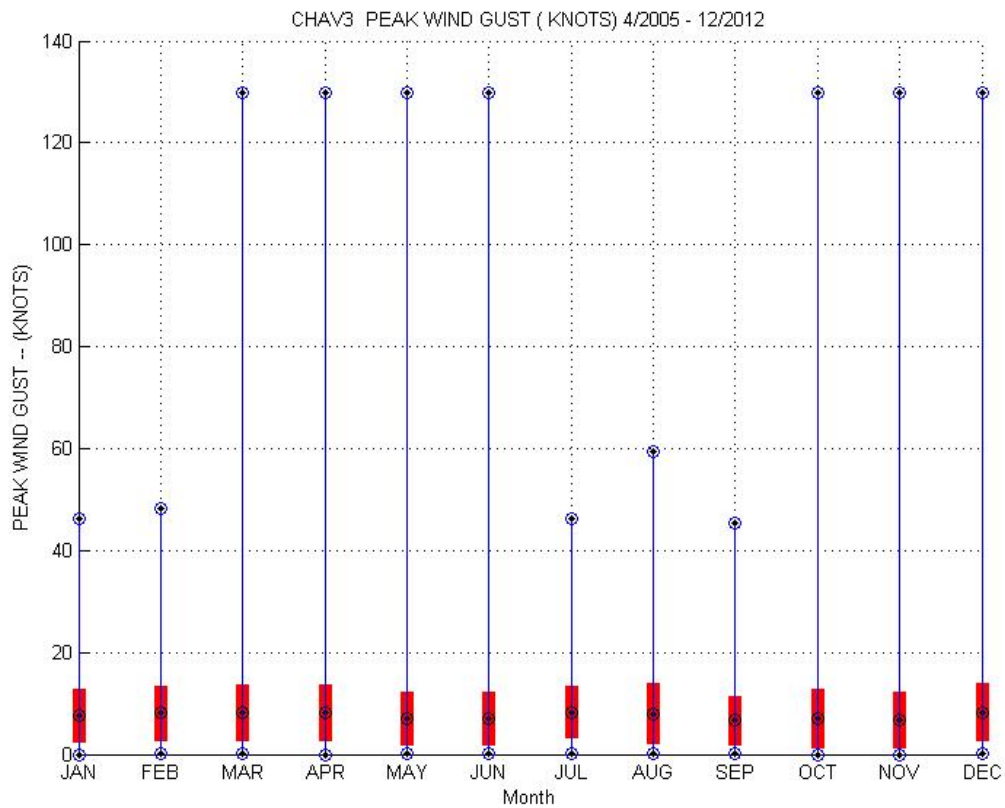


Table 6.01.3 – Peak Wind Gust – Charlotte Amalie, St. Thomas (NOAA)

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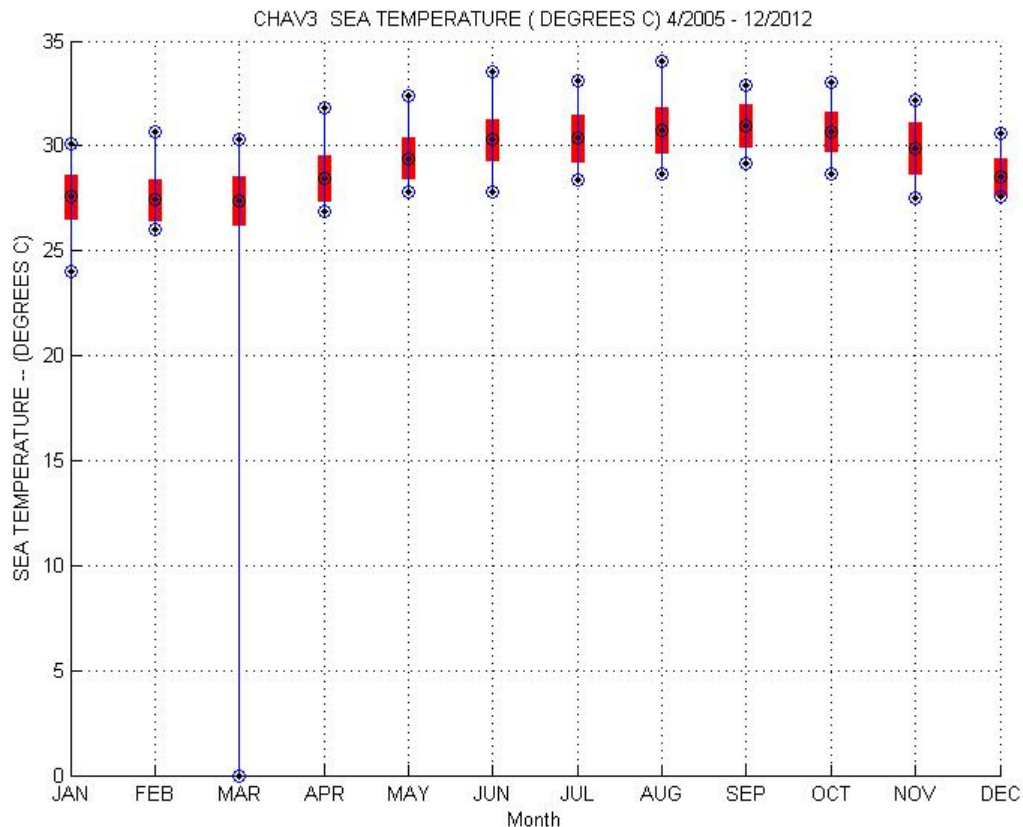


Table 6.01.4 – Average Sea Temperatures – Charlotte Amalie, St. Thomas (NOAA)

The average annual rainfall on St. Thomas is about 40 inches, ranging from about 30 inches in the east to more than 50 inches in the mountains of the northwest. Average annual temperature is a moderate 79°F, with an average low in winter of 76°F and an average high in summer of 84°F; temperatures are 2 to 3 degrees lower at altitudes of 800 to 1,000 feet. Occasionally, maximum daily temperatures will exceed 90°F and minimum temperatures will be less than 70°F. Prevailing wind direction is from the east or northeast.

Rain generally occurs in brief, intense showers of less than a few tenths of an inch. Rains exceeding one inch in 48 hours occur about 7 or 8 times a year in the central part of the island; they are slightly more frequent in the mountains of the northwest and less frequent in the eastern part. February and March are the driest months and September is the wettest. Nearly half the average annual rain falls from August through November. Large storms can occur in any month although more likely during July to November, the hurricane season. (Jordan, 1975).

Impact of Wind, Climate and Weather on the Proposed Project

The applicant has carefully analyzed both climate and weather. The proposed cable system has been designed to have structural stability to withstand wave stresses and current forces through the depth of placement and anchoring mechanisms to be incorporated at hardbottom in shallow water. No impact

from climate or weather is anticipated for the proposed project, neither from routine events nor extreme weather events such as hurricanes while the cable is laid on the seafloor.

6.02 Landform Geology, Soils and Historic Land use

Geology of St. Thomas

St. Thomas, along with St. John, make up the northern most islands of the U.S. Virgin Islands, lying 40 miles north of St. Croix and separated from it by an ocean trench 3,600 meters deep. It lies about 80 miles East of San Juan, Puerto Rico. St. Thomas is the second largest island in the USVI, with a total area of 20,480 acres (32 square miles). The island is approximately 13 miles long, east to west and is about 4 miles at the widest. St. Thomas, along with St. John and Water Island are part of the Puerto Rican geographical bank (the Greater Antilles), while St. Croix is geographically located in the Lesser Antilles and lies completely within the Caribbean Sea

The Virgin Islands are near the northeastern corner of the present Caribbean Plate, a relatively small trapezoidal-shaped plate which is moving eastward relative to the North and South American continents carried on the American Plate. The arc of the Lesser Antilles is an active volcanic arc above a subduction zone in which Atlantic oceanic crust of the American Plate is carried downward under the Caribbean Plate. The Caribbean Plate is sliding past North and South American plates along east-west trending northern and southern boundaries. The western boundary is a subduction zone in which the Cocos Plate is being driven northeastward and down under the edge of the Caribbean Plate west of Central America (Rogers, 1988).

The land surface of St. Thomas is almost entirely sloping and extends seaward from a central ridge, that is 800 to 1,200 feet above mean sea level and runs the length of the island. The slopes, which commonly exceed 35 degrees, are dissected by numerous stream channels of steep gradient. The general appearance of St. Thomas is a panorama of steep interstream spurs and rounded peaks (Jordan and Cosner, 1973).

Flat land in St. Thomas is confined to the Charlotte Amalie area and a few small alluvial-filled embayments. The only variation in the general topography is in the upper valley of Turpentine Run in eastern St. Thomas. This valley has rolling hills in a basin surrounded by steep slopes and sharp ridges. Streamflow on St. Thomas is generally intermittent, however, Bonnes Resolution Gut, on the north side of the island and Turpentine Run Gut, on the southeast, have perennial reaches. (Jordan, 1973; WATER USE MAP)

The geology of St. Thomas is similar to that of St. John. The oldest rocks exposed on St. Thomas consist of keratophyres, spilites, and radiolarites, collectively called the Water Island Formation (Henry 1994). These weakly metamorphosed, uplifted, folded and faulted rocks were derived from volcanic and other narrow-trench sediments originally deposited by turbidity currents on the deep ocean floor about 70 to 80 million years ago (Adey 1977). Carbonate rock is found only rarely on St. Thomas and St. John and is composed primarily of the Outer Brass Limestone deposited during a lull in volcanic activity in the Turonian and Santonian Age (Donnelly, 1959).

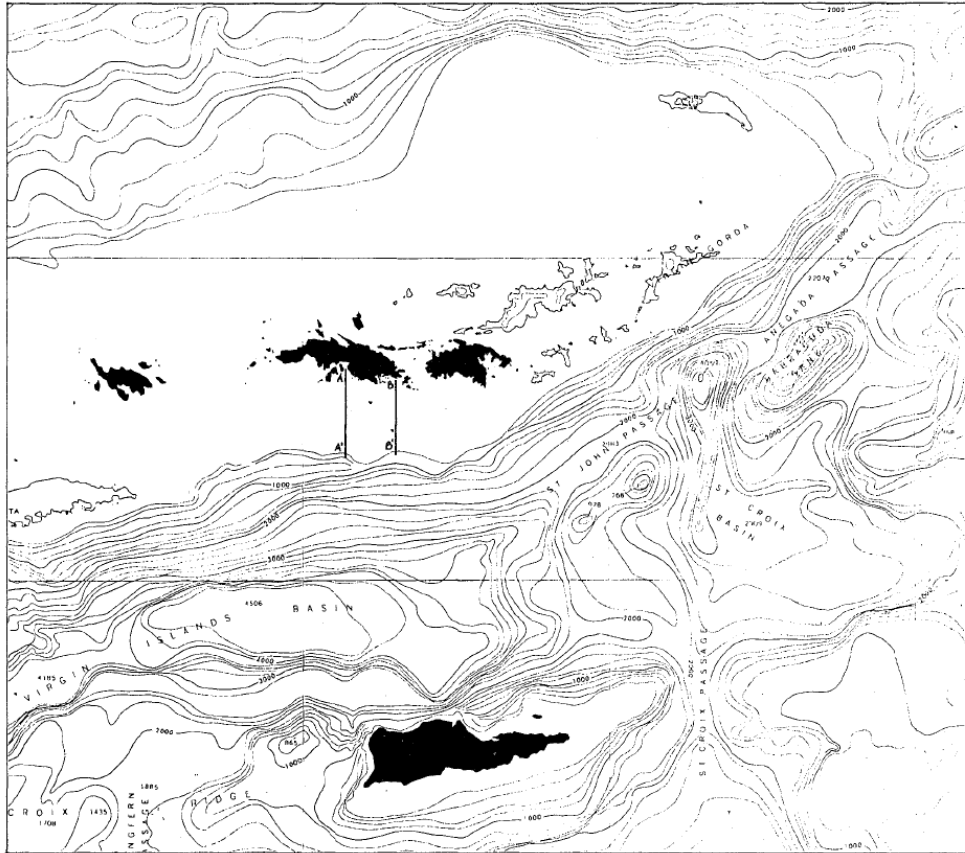


Figure 6.02.1 – Bathymetry of USVI basins and plateaus (Van Eepoel, et al, 197.)

Two large basins, the Virgin Islands Basin and the St. Croix Basin, separates St. Croix from the other Virgin Islands. Within the distance between St. Croix and St. Thomas (about 40 nautical miles), hydrographic charts show that the ascent from the sea floor north of St. Croix is as much as 70 degrees. Frassetto and Northrop (1957) indicate that this northern topographic slope extends downward to the Virgin Islands Basin at a gradient up to 43 degrees. There is an ascent of 13,656 feet within a horizontal distance of 25,800 feet, terminating with the steep north coast in the vicinity of Hams Bluff. Meyerhoff (1927) suggested that this block faulting took place during the late Pliocene or early Pleistocene, prior to which St. Croix was physically attached to the northern Virgin Islands.

The insular shelf south of St. Thomas and St. John has an average width of about 14 km. From the rocky shoreline of the islands, the bottom slopes seaward at an initial rate of about 16 m/km to depths of 25 or 30 meters, then assumes a more gradual slope to about 45 meters at which depth the central and outer platform is essentially level. In the western part of the area, the shelf edge lies at about 45 meters below which the slope increases sharply to about 275 m/km. In the eastern part of the area, the slope change occurs at about 55 meters, except where a well-developed, drowned reef with crests as shallow as 20-30 meters marks the shelf edge. The shelf can be divided into two parts on the basis of topography and shallow structure. West of a north-south line drawn through the vicinity of Charlotte Amalie, the shelf profile is smooth and no strong topographic trends are apparent. On the other hand, shelf profiles to the east are more rugged and very strong topographic trends are developed along northeast-southwest lines (Garrison, 1971)

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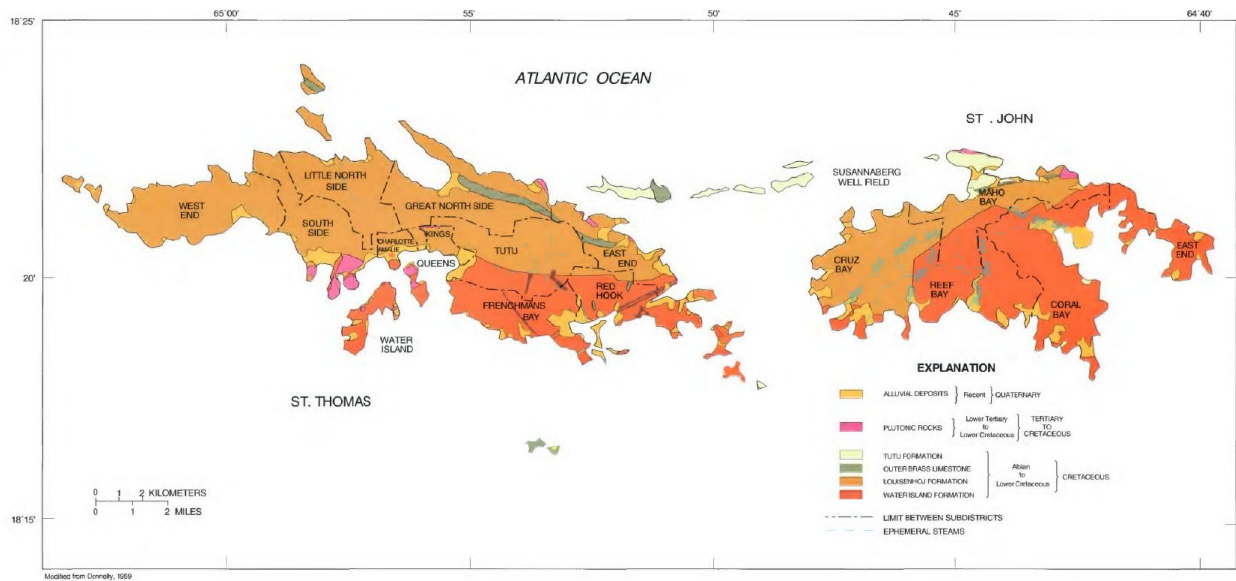


Figure 6.02.2 – Generalized surficial geology in St. Thomas, U.S. Virgin Islands (Veve & Taggart, 1996)

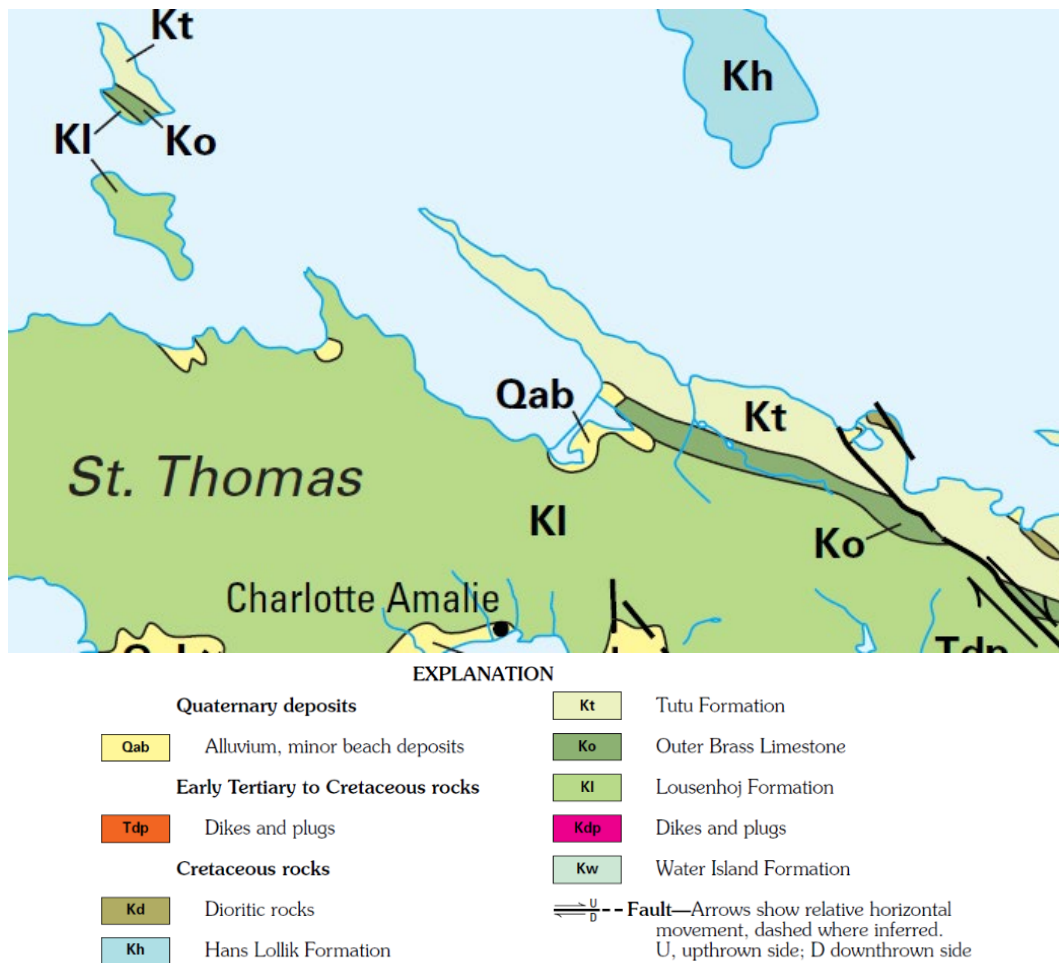


Figure 6.02.3 –Geological formations in the vicinity of project site (Renken R., 2002)

Geology

The landing site is positioned 18°22'19.7"N 64°55'42.5"W, while the cable station is located at 18°22'26.0"N 64°55'40.4"W, both on the north coast of Magen's Bay. The Custom Soil Survey by the National Resource Conservation Service (NRCS) identifies the soil type for the landing site as Beaches, stone (BtB) and at the cable station as extremely stony Annaberg-Maho Bay complex with of 20 to 40 percent slopes (AmE) and 40 to 60 percent slopes (AmF). On the opposite side of the landing site there is Southgate-Rock outcrop complex (SrF).

Annaberg-Maho complex are well drained, moderately permeable soils and extremely stony. These soils are generally found on summits and side slopes of volcanic hills and mountains. Slopes range from 12 to 90 percent.

Elevation at the project site varies from 0 to 280 feet above sea level.

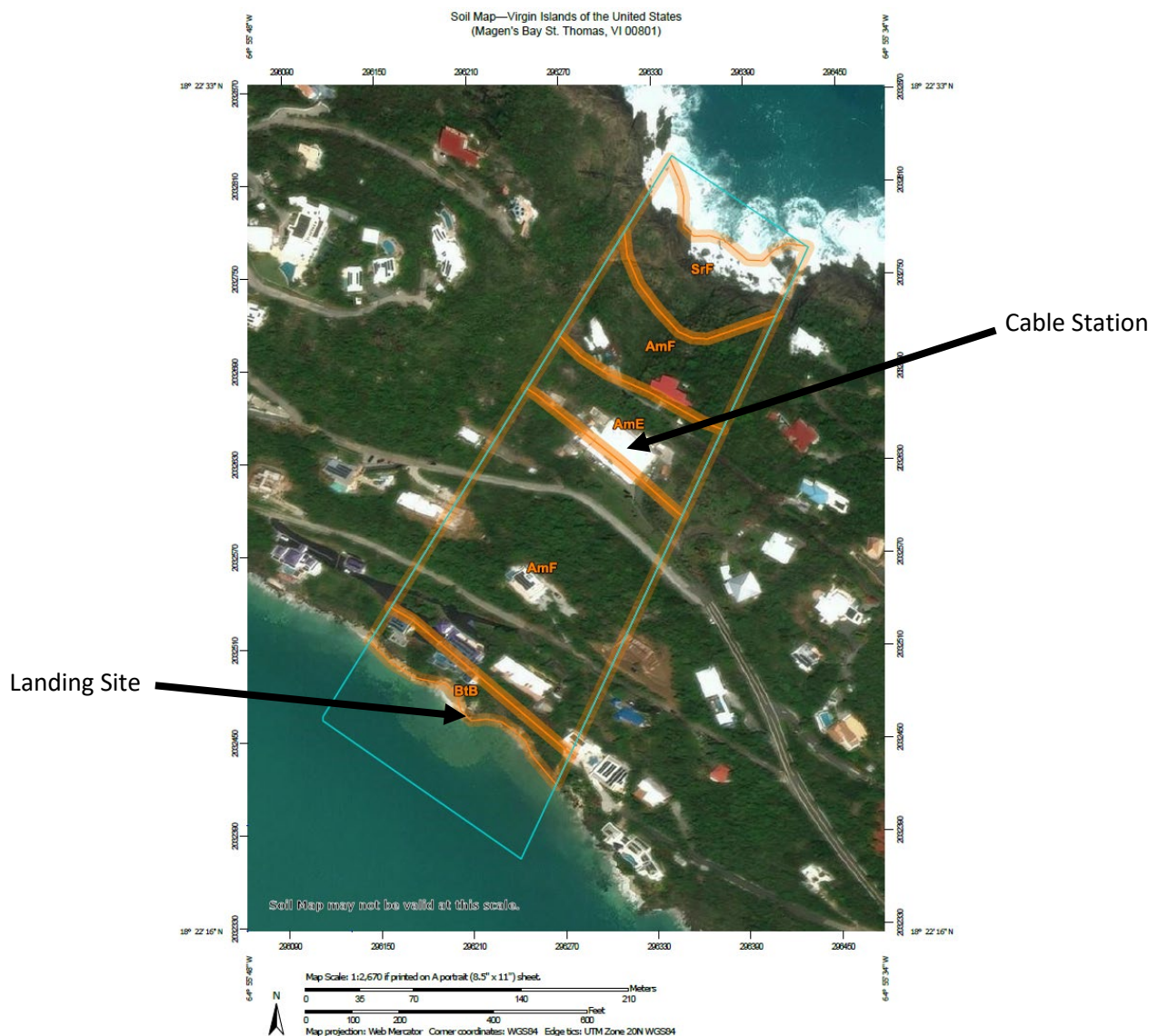


Figure 6.02.4 – Soil types in project vicinity (NRCS Soil Survey)

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Historic Use

The land has been used as a communications hub for AT&T since the mid-nineties, when telecommunication cables were installed along with conduit to the shoreline to route the cables below ground.

The building structure and driveways have been built on the property since at least 1970, per satellite photos published by USGS.



Figure 6.02.5 – 1970 Historical Photo, Magen's Bay, Source: USGS.

Seismic Activity

The Puerto Rico/Virgin Islands region is located at the northeastern corner of the Caribbean plate where motions are complex. The westward-moving North American plate is being driven under the Antilles Arc where volcanism is active. On the north side of the plate corner, the North American plate slides past the Caribbean but irregularities in the plate boundaries cause stresses that result in a complicated under thrusting of plate fragments. The interaction of plates causes the volcanism of the Antilles Arc on the

eastern boundary of the Caribbean plate and creates major stresses all along the northern boundary (Nealon & Dillon, 2001).

Since the 1867 Virgin Islands Tsunami caused by a magnitude 7.5 earthquake in the Anegada trough (USC Tsunami Research Center), there has been continuous low intensity activity all below 6.0 Richter. Over the last several years, numerous minor tremors have been felt on the island. This increased activity is associated with the volcanic eruptions that have been occurring to the southeast on the island of Montserrat.

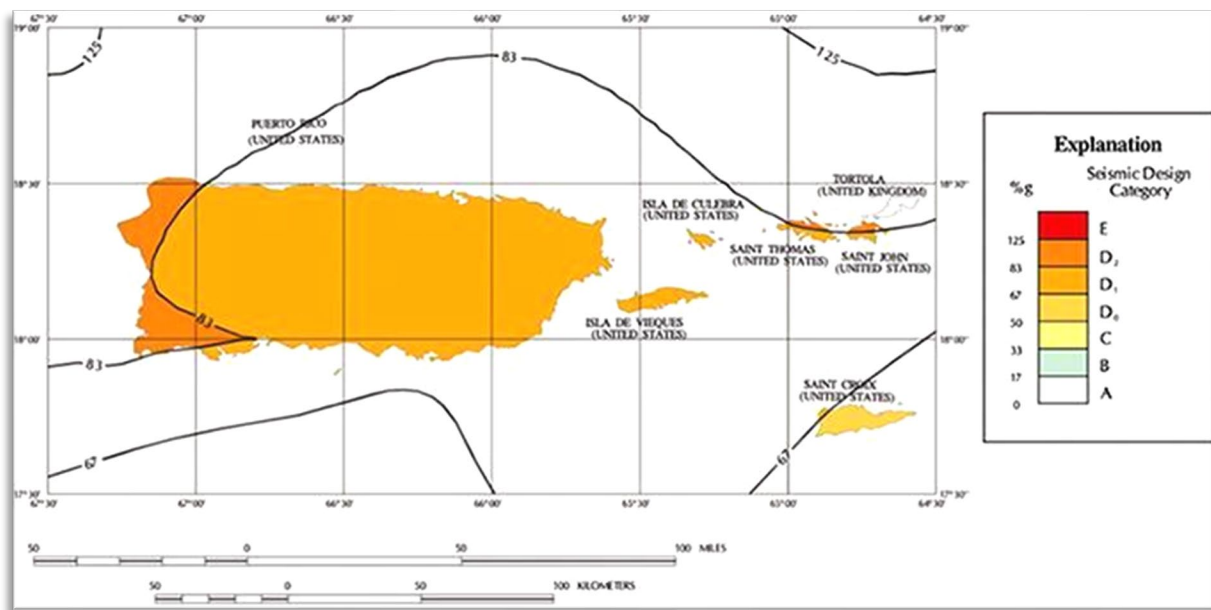


Figure 6.02.6 –FEMA Earthquake Hazard Map, Puerto Rico (FEMA Earthquake Hazard Maps)

Impact of Geology on Proposed Project

The applicant has carefully considered landform, geology, soils and historic land use. The project has been designed to be consistent with these conditions, and as the proposed project plans to utilize existing infrastructure and conduct little to no earth movement, to minimize impact on the surrounding area and geology.

6.03 Drainage, Flooding and Erosion Control

a. Impacts of Terrestrial and Shoreline Erosion

This project will not alter impervious surfaces to the site, or change topography or contours for the site. There will be no impacts to terrestrial and shoreline erosion as the cable will be routed underground to the shoreline and tie into a manhole structure and existing conduit already buried. The proposed development will not alter the existing drainage patterns of the site. If required, standard sediment and erosion control devices and BMPs will be implemented when performing any site work and will be maintained throughout the life of the project.

b. Relationship of the Project to the Coastal Flood Plain

Review of Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for U.S. Virgin Islands Index indicate that part of the project area is within flood zones rated Zone X and Zone VE. See below in Figure 6.02.6 which is a portion of FIRM Panel 0011G, increased in size for clarity, depicting site location (red box) relative to flood zones. Project location rated Zone X has been determined to be outside the 0.2% annual chance floodplain. Zone VE is known as a coastal flood zone with velocity hazard (wave action) and a base flood (100-year flood) elevation of 12 feet.

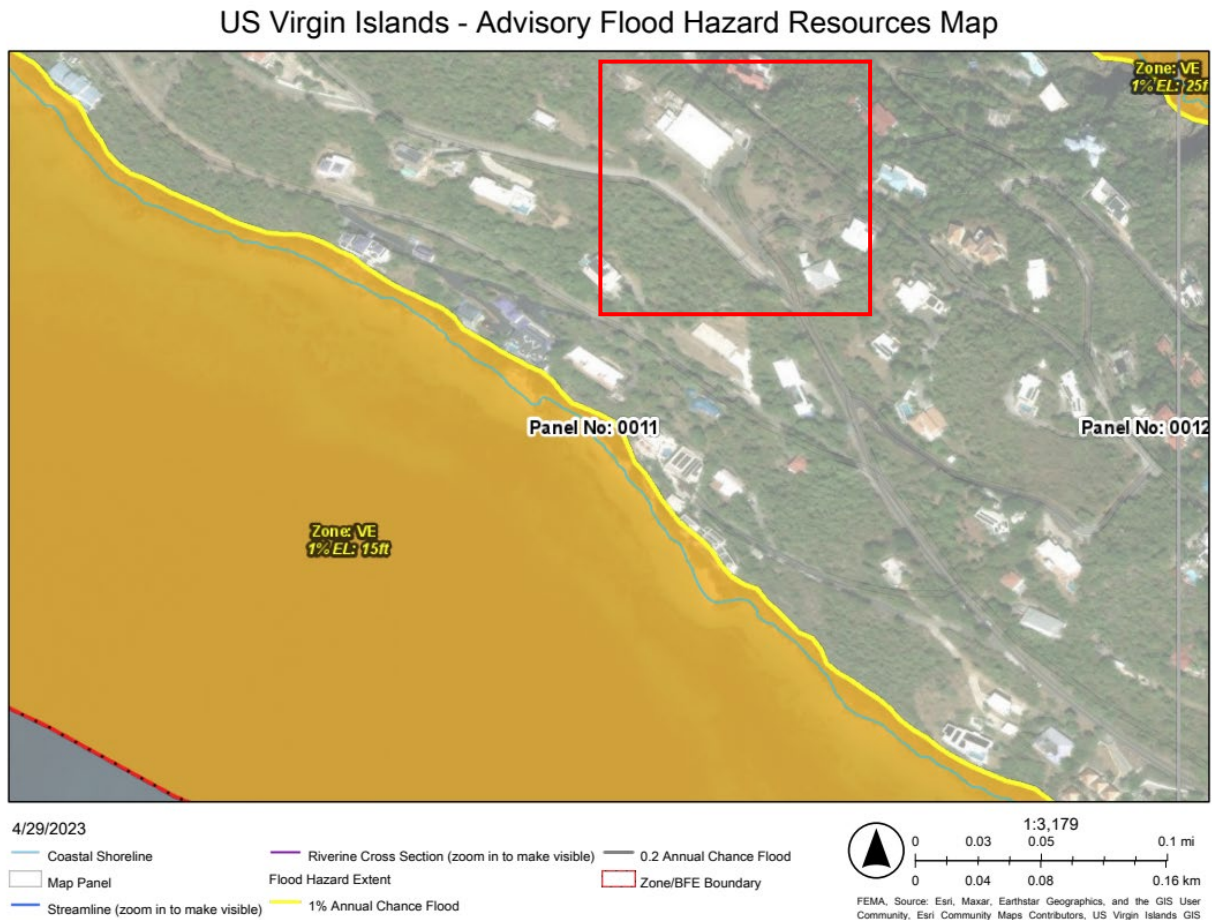


Figure 6.03.1 – Section of Flood Insurance Rate Map (FIRM) Panel 0011G, 11 of 94. 2018

6.04 Fresh Water Resources

St. Thomas, USVI is limited in the number of freshwater resources to a few wells located around the island and mostly intermittent and ephemeral streams and ponds which dry up during periods of limited rainfall. Some perennial streams and freshwater ponds/basins do exist, but not as a reliable source of freshwater. The majority of potable water is either captured by rooftops or from wells and stored in cisterns or is desalinated seawater. The project is not located or will affect any freshwater source in the area and will have no negative impact on the availability of freshwater resources.

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6.05 Oceanography

a. Seabed Alteration

Laying cables can potentially lead to seabed disturbance, damage, displacement, or disturbance of flora and fauna, increased turbidity, as well as alteration and remobilization of contaminants from sediments. These effects are primarily restricted to the installation, repair and/or removal phase and are generally temporary. In addition, their spatial extent is limited to the cable corridor which can be up to 10 m width if the cable has been ploughed into the seabed; (OSPAR 2009). Some mobile benthic species (for example, crabs) are able to avoid most disturbance whereas sessile (bivalves, tubeworms etc.) and sensitive species (such as slower growing or fragile species) will be more impacted. (OSPAR 12/22/1, Annex 14)

Benthic surveys of the proposed cable route were conducted November 18-20, 2022 to identify and quantify the presence/absence of marine habitats, to include but not be limited to coral reef structures (both mesophotic and shallow-water), seagrasses, hardbottom, and fisheries habitat that may be impacted by the installation of the cable. Particular attention was paid to areas near land that may have connected or associated hard-bottom habitats that could support these deep reefs.

The benthic community was a uniform fine sand/silt for the entire route except for a short stretch of approximately 0.5km east of the north end of Outer Brass Island in 70-foot-deep water and approximately 0.08 km near the shore landing site within Magen's Bay. Those sections are noted in the attached Overview Map of the proposed cable route.

In the 70-foot-deep reef discovered, an existing cable is plainly visible with no observed disturbance of benthic habitats as with other existing cables found elsewhere, some on the reef and some well off the bottom. No evidence of habitat degradation was observed anywhere near existing cables. The reef documented at approximately 200' to 300' from shore is a mixed bottom with various habitats and benthic life, including hard corals of various species so attention must be paid as to not disturb this area during installation.

b. Tides and Currents

The Caribbean current is a powerful surface oceanic current passing west through the Caribbean Sea, then north through the Yucatan Channel, then east out to the Straits of Florida to form the Florida Current and join the Gulf Stream (See Figure 6.05.1). These surface currents are driven by the North Equatorial Current. The warm Caribbean Current, derived from the junction of the North Equatorial Current and the Guiana Current, flows at an average rate of 38 to 43 cm (15 to 17 inches) per second and transports about 27.5 million cubic meters (~1 billion cubic feet) of water per second (Britannica, 2007).

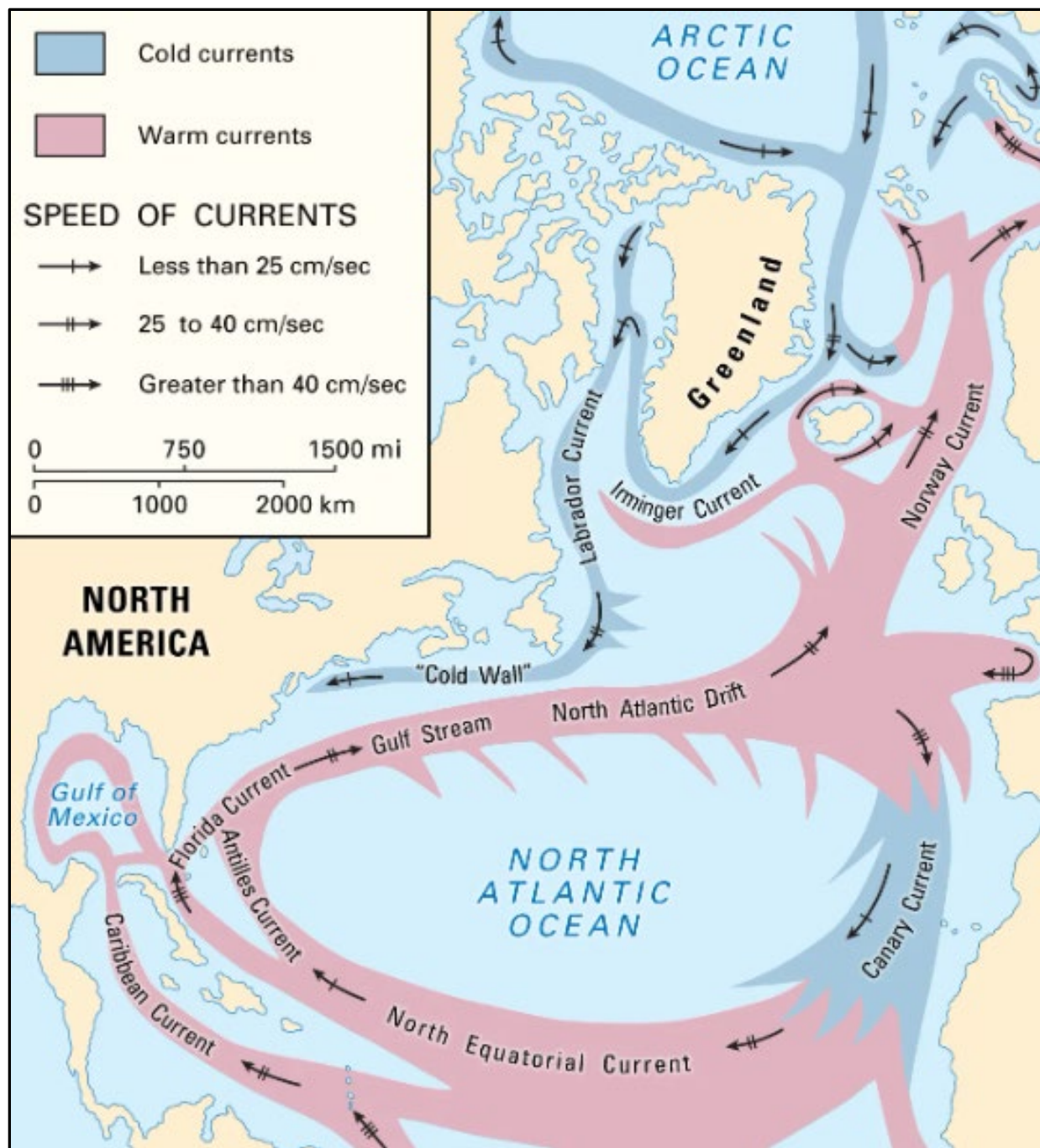


Figure 6.05.1 – Major currents, North Atlantic Ocean (LaMourie, 2021)

These currents change very little from season to season with the currents coming more from the south during the summer months (Figure 6.05.2). As the figure illustrates, there is usually a westerly current observed between St. Croix Island and St. Thomas Island (NOAA – BookletChart).

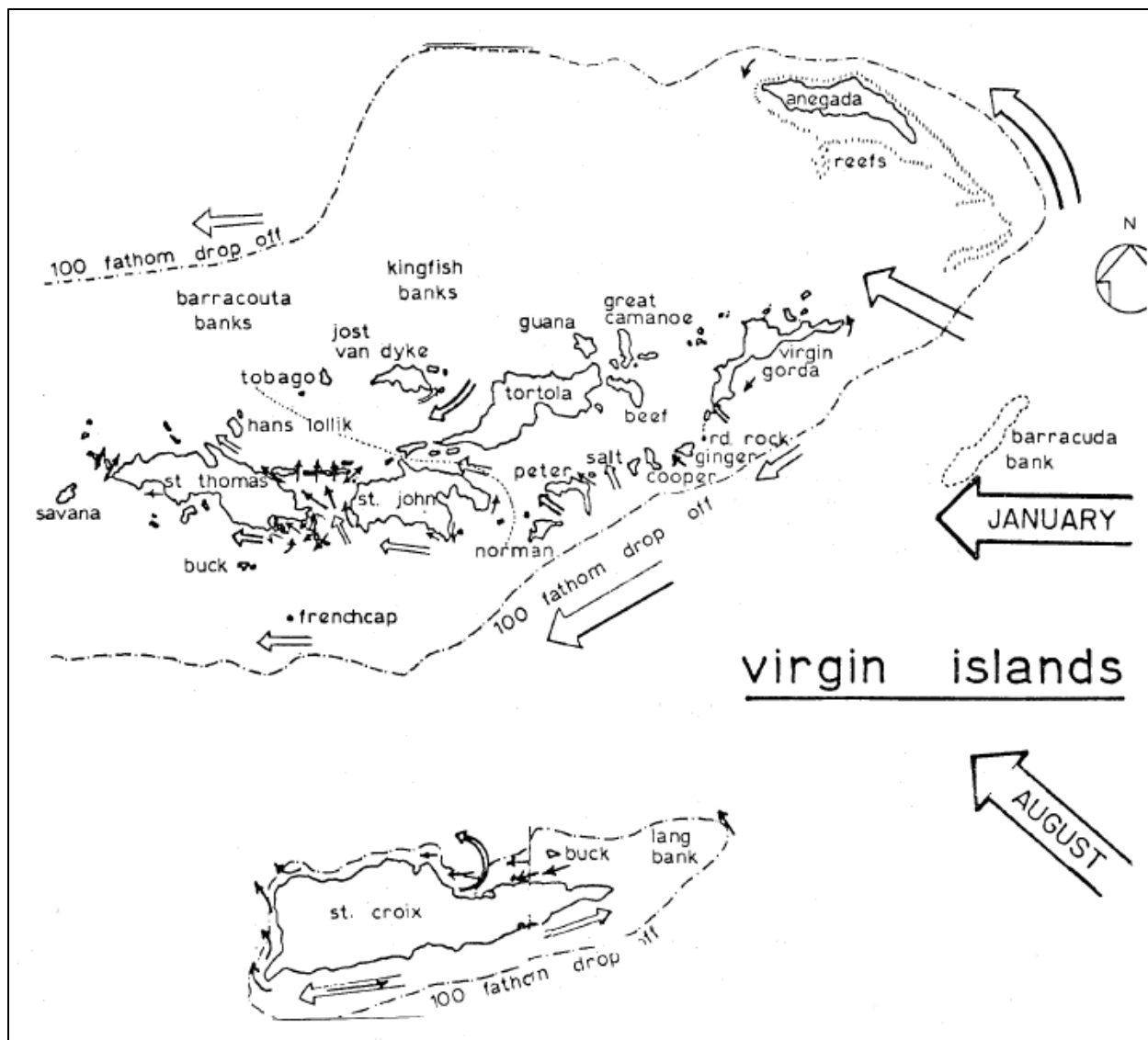


Figure 6.05.2 – General current patterns on the island platforms (Dammann, 1969)

Because of different exposures to open ocean water on one side and modified circulation of Caribbean water on the other, the north and south coasts of St. Thomas and St. John experience different tidal activities. On the north, tides are similar to the north coast of Puerto Rico, being semidiurnal (two cycles of high and low water per 24 hours). The time of tide stages in the Virgin Islands are earlier than in Puerto Rico, however. On the south coasts of St. Thomas, tides typically exhibit two (bi-modal) ‘peaks’ during the diurnal period (24-hour day), with the second (lesser) ‘peak’ having relatively small ebbs and flows. The mean tides range from 0.8 feet to 1.0 feet and the spring tidal ranges reach up to 1.3 feet (IRF 1977).

In the Virgin Islands, tidal ranges and tidal currents, except in some inshore localities, are not significant. The small islands, lacking complex shoreline physiography, do not restrict changes in water level. The sea flows around the islands relatively unimpeded, resulting in tidal fluctuations of only a few inches to a foot.

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Furthermore, the steep slopes of the islands rising out of the water means that the intertidal zone, the part of the shoreline regularly covered and uncovered by the tides, is very narrow. Therefore, there are no large areas of tidal flats uncovered at low tides as in other places in the world, especially along continental coastal zones.

One of the consequences of this small tidal action is that water exchange in bays due to tidal action is usually very small. For example, it is estimated that 24 to 40 tidal cycles alone would be necessary to exchange all the water in the main part of St. Thomas harbor. Fortunately, waves, swells and oceanic currents are generally successful at flushing most bays. However, these forces are considerably reduced by the time they reach the heads of deep embayments.

As a result, circulation may be poor in the inner reaches of some larger embayments. The innermost portions of the mangrove lagoon on St. Thomas, Salt River of St. Croix and Coral Bay of St. John are examples of this. To a lesser extent, similar conditions have been observed at the head of Vessup Bay (Redhook), St. Thomas and Cruz Bay, St. John, and most likely occur in other similar locations (IRF, 1977).

The closest NOAA tidal station is located in Charlotte Amalie, St. Thomas, VI and is Station ID: 9751639. The NOAA tidal station is located at Latitude: 18° 20.1' N and Longitude: 64° 55.2' W. The mean range is 0.7 ft. and the diurnal range is 0.79 ft. Tidal data from the station is shown below in Table 6.05.1.

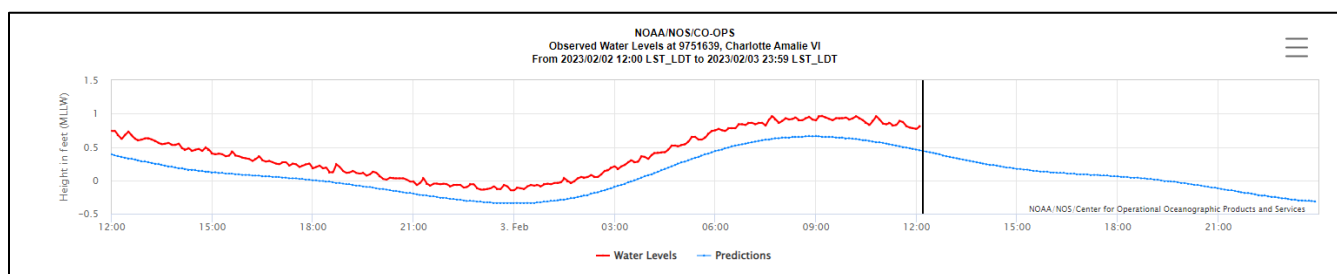


Table 6.05.1 – Observed Water Levels at Charlotte Amalie, St. Thomas (NOAA)

c. Wave and Wind Impacts

The deep-water wave regime of offshore waters is driven by the northeast trade winds most of the year. On the average, wave heights of one to three feet approach from the east 42 percent of the time throughout the year. For short periods, 0.6 percent of the time, these easterly waves reach 12 feet. In addition to the normal easterly swell that affects the windward coasts of the islands, there are two seasonal modes of wave approach that affect leeward coasts: a southeasterly chop and swell and a northern swell. The southeasterly swell with waves one to twelve feet high becomes significant in late summer and fall when the trade winds blow from the east or when tropical storms and hurricanes pass the islands at a distance to the south. The east-southeasterly wind and wave regime is associated with the doldrum belt located over the interior of Venezuela and with an intensive high-pressure area over Bermuda. By contrast, during winter when the doldrum belt is located farther south along the equator and the Bermuda High is weak, a long length and long period northern swell develops. Although the swell offshore is only one to five feet high and occurs only four percent of the time, it is significant because it gains heights of ten to twelve feet nearshore.

Waves tend to straighten the north coast of St. Croix by erosion of headlands and deposition of sand in the bays. Straightening along the north coast of St. Thomas and St. John is opposed by the variations in resistance to erosion of different rock types. For example, the projecting points on the north side of Magen's Bay, St. Thomas, at Mary's Point, St. John and of Thatch and Grass Cays owe their origin to the Tutu rock formation which is more resistant than the Brass limestone. Commonly, on the north coasts, waves approach the shore from two principal directions. Short period waves and chop approach from the east and northeast, and, at the same time, long period swells approach from the north. However, in the winter, from November through March, the northern swells are larger than in summer, and they are refracted and redirected more around points and islands.

Around islands like Dutchcap Cay, St. Thomas and Buck Island, St. Croix, the two wave types produce very complicated patterns of crossing sea and swell which can be observed on aerial photographs. Along coasts fronted by partly submerged reefs, waves play a significant role in circulating back reef water. As demonstrated in Christiansted harbor, the mass transport of waves breaking over Long Reef drives a harbor-wide circulation that flushes most of the harbor water through the entrance in about fourteen hours. Consequently, the response of waves to reefs and nearshore bathymetry is significant in reducing pollution and improving water quality. (IRF, 1977)

Figure 6.05.5 below shows current wind speed data from the Charlotte Amalie NOAA tidal station referenced in Section 6.05.b.

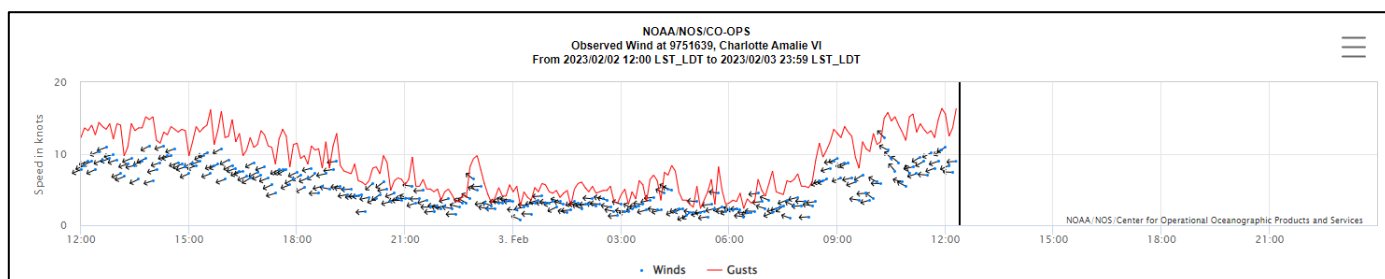


Table 6.05.2 – Observed Wind at Lime Tree Bay, St. Croix (NOAA)

d. Marine Water Quality

The water surrounding the site is classified as Class B as specified in the Amended V.I. Water Quality Standards of 12VIRR186. Class B waters have a designated use of propagation of desirable species of wildlife and aquatic life and primarily contact recreation such as swimming, fishing, etc. Water quality criteria include dissolved oxygen not less than 5.5 mg/l, exception if cause is natural forces. The pH must not vary by more than 0.1 pH unit from ambient, and at no time may the pH be less than 7.0 or greater than 8.3. Bacteria (enterococci) cannot exceed 30 CFU/100ml (30-day geometric mean), turbidity readings cannot exceed 3 NTUs, and clarity may not exceed a level where a Secchi disc cannot be visible at a minimum depth of one meter.

VI DPNR performs routine water quality measurements at select locations. The subject waterbody has four associated Water Quality Monitoring Stations as noted below:

Waterbody	Location	Sample Station Number
VI-STT-10	Magen's Bay	STT-15, STT-15A, STT-15B Magen's Bay, VI672756 Magen's Bay

According to VI DPNR's 2020 Integrated Report (IR), which entails CWA Section 305(b) water status report and the CWA 303(d) list, the VI-STT-10 waterbody, Magen's Bay, is established as a local conservation area but has been indicated as being impaired for Enterococcus and Turbidity reported for 6 years within a 10-year period. An impairment of pH was reported in this waterbody in 2010, 2012, and 2014 but has now been resolved with no exceedances since 2016 however, no reason for the water quality status recovery was specified.

6.06 Marine Resources and Habitat Assessment

Overview & Research

Magen's Bay and its surrounding areas have been classified as particularly sensitive relating to marine resources and habitats, having been classified as an Area of Particular Concern (APC) as well as a Marine Protected Area (MPA) since 1993 and in subsequent evaluations as recently as the 2020-2025 United States Virgin Islands' Coral Reef Management Priorities, having been ranked within the top 10 areas most suitable for protection and management intervention for its coral reefs.

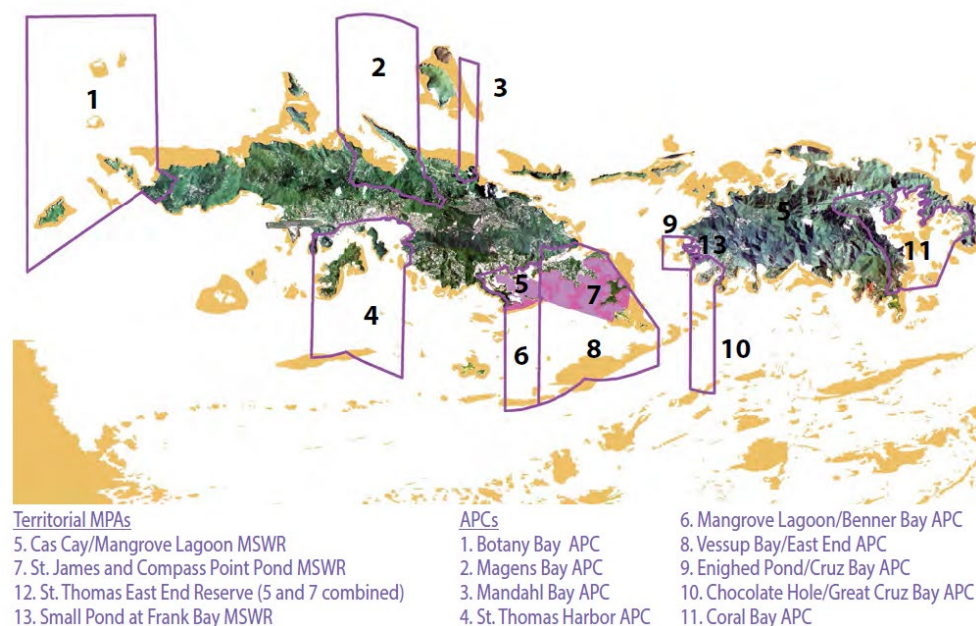


Figure 6.06.1 –St. Thomas and St. John MPAs and APCs(NOAA, October 2014)

Magen's Bay has also been previously classified as an Area of Particular Concern (APC) due to it being listed on NOAA's National Marine Protected Areas. The Magen's Bay APC is located on the north central side of the island of St. Thomas. This APC is bound by Tropaco Point in the west, the entire Peterborg peninsula in the east, and has a seaward boundary that extends directly north to the shelf edge or three-nautical mile territorial limit (whichever is closer). Valuable resources within this area include primary archaeological sites, several types of forest, fish nursery habitats, and 8 endangered species (U.S. Marine Managed Areas Inventory (2006a), NOAA's National Marine Protected Areas Center).

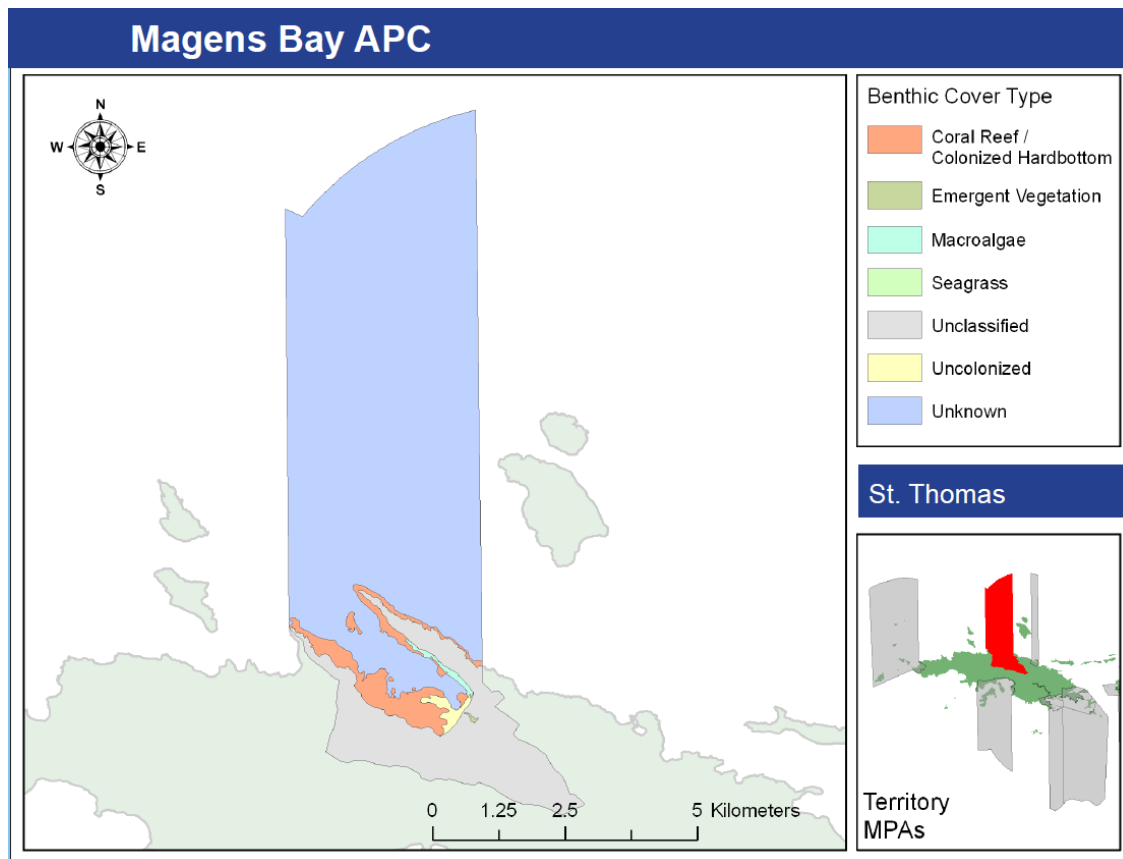


Figure 6.06.2 –Magen's Bay APC (NOAA, 2006)

The Environmental Sensitivity Index (ESI) Map (Figure 6.06.3) indicates presence of fish, octopus, gastropods (i.e., conch), lobster, dolphin and whale in nearshore as well as shelf waters closer to Outer Brass Island and the proposed cable route. Of the whale species, the humpback whale is considered federally endangered and breeding grounds are indicated to be near these waters around the months of November to May.

The map and the U.S. Fish & Wildlife Information for Planning and Consultation (IPaC) website tool also indicates that the inner Magen's Bay beach to be an area for turtle nesting, particularly in January and December, and a breeding ground for a variety of marine and terrestrial species including crab, waterfowl, wading birds, seabirds, and shorebirds. Of the bird species, three are considered endangered: the Caribbean Coot (*Fulica caribaea*), ruddy duck (*Oxyura jamaicensis*), and white-cheeked pintail (*Anas bahamensis*) all of which breeds and nests year-round. In addition, two plant species considered endangered: the *Manilkara bidentata* and the *Tillandsia lineatispica*, were noted on the ESI near the

vicinity of the project area. ESI shoreline habitats in the project area are a mix of exposed rocky cliffs and solid man-made structures with smaller areas of fine to medium-grained sand beaches and exposed wave-cut platforms in bedrock.

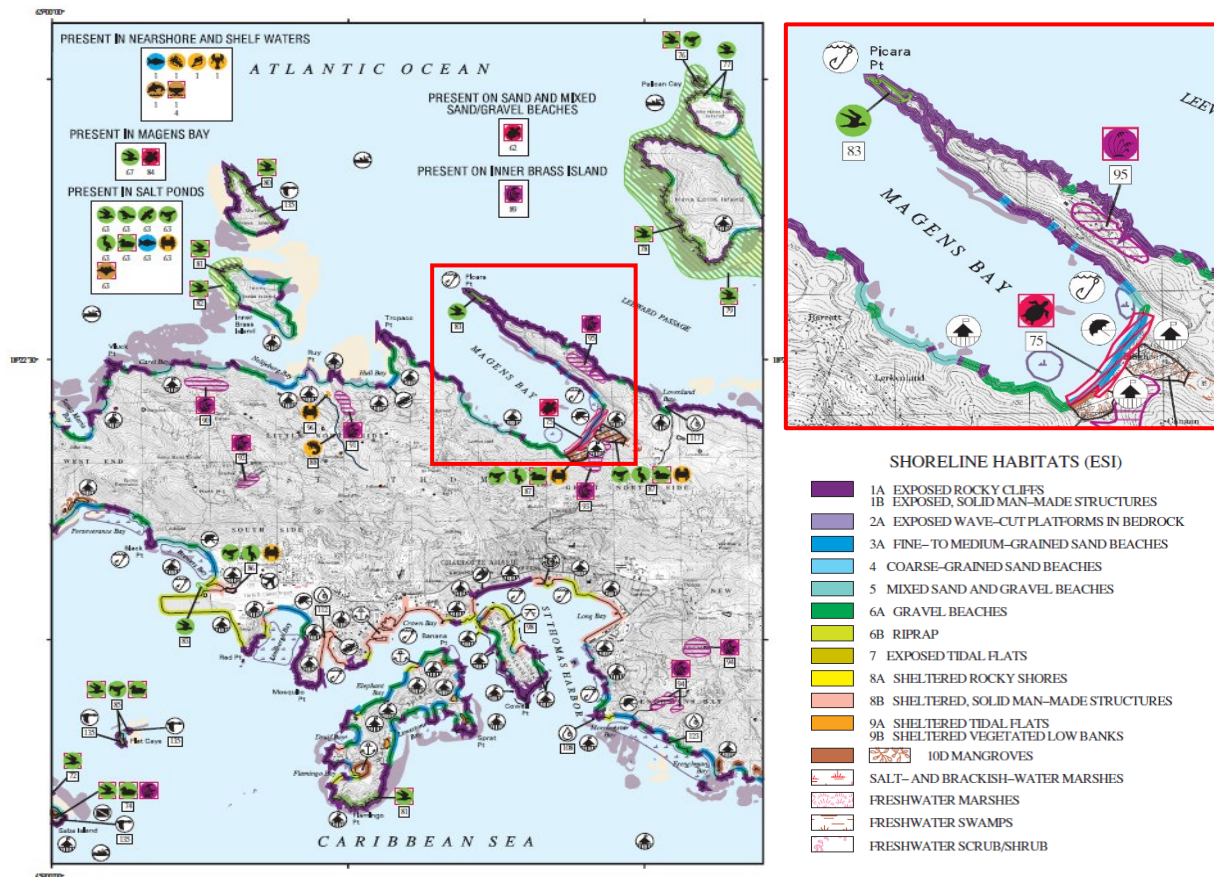


Figure 6.06.3 – Environmental Sensitivity Index Map with enlarged portion of project site (outlined in red), VI-1, St. Croix, USVI (NOAA)

A review of the 2002 NOAA Benthic Habitat Maps (Figure 6.06.4 below) shows significant diversity of benthic habitats in this region of St. Thomas. Directly at the shoreline of the landing point is classified as macroalgae/patchy/50-90% for less than 200 meters. This is followed by approximately 250 meters of reef/linear reef. Further north of the project location, the habitat transitions to reef/colonized bedrock and reef/colonized pavement also followed by reef/linear reef. Zones include bank/shelf (within the microalgae and reef/colonized habitats) and forereef (within the reef/linear reef habitat) and at the furthest distance from shore.

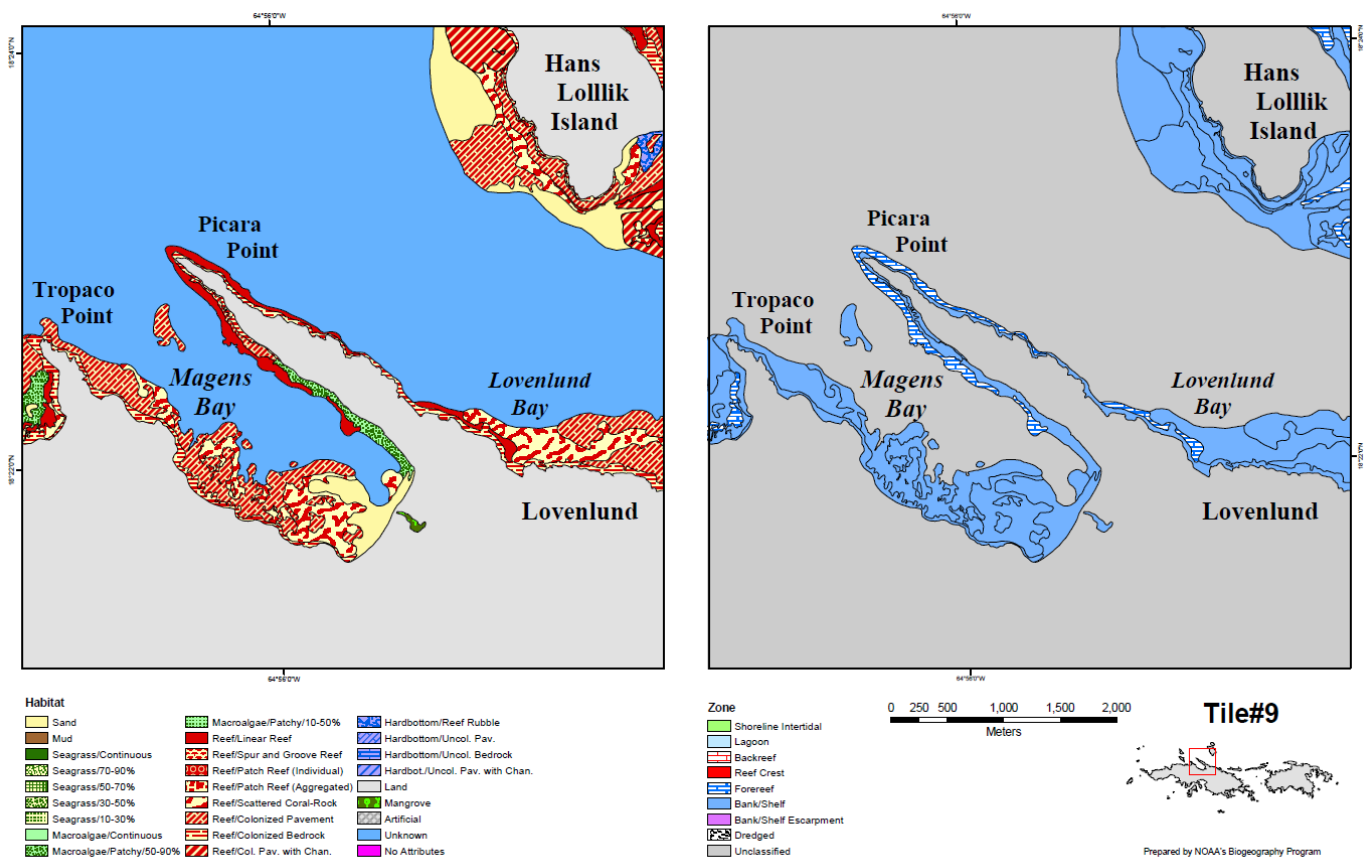


Figure 6.06.4 – Benthic Habitat in project vicinity, Tile #9 (NOAA)

Field Surveys

Benthic surveys of the proposed cable route were conducted November 18-20, 2022, with subsequent follow up surveys the following year on November 6, 2023, to identify and quantify the presence/absence of marine habitats, to include but not be limited to coral reef structures (both mesophotic and shallow water), seagrasses, hardbottom, and fisheries habitat that may be impacted by the installation of the cable. Particular attention was paid to areas near land that may have connected or associated hard-bottom habitats that could support these deep reefs.

2022/11/18 -11/20 – STT Observations and Notes

The benthic community was a uniform fine sand/silt for the entire route except for a short stretch of approximately 0.5km east of the north end of Outer Brass Island in 70-foot-deep water and approximately 0.08 km near the shore landing site within Magen's Bay. Those sections are noted in the attached Overview Map of the proposed cable route.

Of particular concern for the proposed cable route was the possibility of encountering deep water Mesophotic Coral Reefs. These little studied reefs are found elsewhere in St. Thomas, with some habitats

studied under cyclic evaluations such as the NCRMP and TCRMP programs. Areas near land that may have connected or associated hard-bottom habitats that could support these deep reefs were evaluated, but none were found (See Figure 6.06.5).

Figure 6.06.5 – Sites surveyed south of the proposed cable route that are closer to land to evaluate presence of mesophotic coral reef.

Video and still photos were collected from a mid-point on the 70-foot-deep reef discovered between GPS 24 and GPS 25 (Figure 6.06.6). Two 25 meter long transects, one running north and the other south, were laid from this center point via SCUBA with Nikon W300 and GoPro Hero 4 cameras. An existing cable is plainly visible with no observed disturbance of benthic habitats as with other existing cables found elsewhere, some on the reef and some well off the bottom. No evidence of habitat degradation was observed anywhere near existing cables.



Figure 6.06.6 – Location of reef between GPS Points 24 and 25 that is east of Outer Brass Island)



Figure 6.06.7 – Proposed Cable Route as it passes closest to Picara Point

From GPS point #55 on shore, a survey was made with a measuring tape laid along the bottom (and in view in the videos) out 100+ meters from shore to GPS 50 (See Figure 6.06.8). As with other existing cables found elsewhere, the existing cables are plainly visible here, some on the reef and some well off the bottom. No evidence of habitat degradation was observed. The reef documented at approximately 200' to 300' from shore is a mixed bottom with various habitats and benthic life, including hard corals of various species.

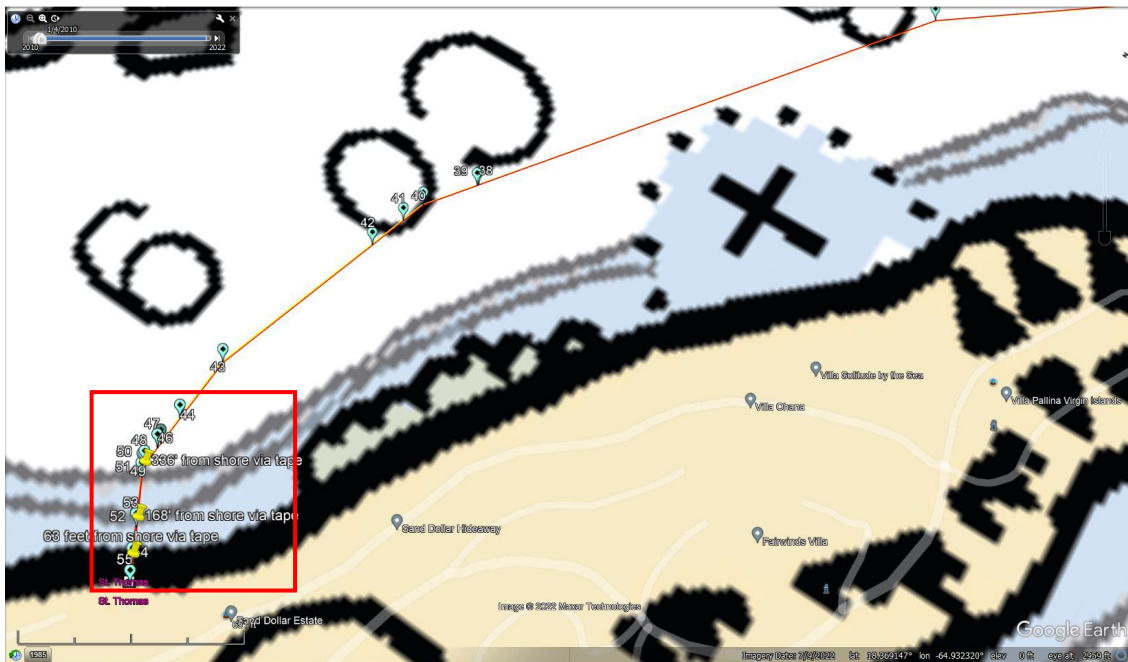


Figure 6.06.8 – NOAA Chart showing Magen’s Bay Shoreline with proposed cable landing and cable route along GPS points

To document the 14.5 mile proposed route, 5 ¾ hours of video footage was captured using a professional Outland UWC-325/P Color Camera which featured very low light sensitivity (.001 lux) using a 3.6mm f1.4 lens measuring 1.62" x 5" with a depth rating of 2000 m and 750 lines horizontal resolution. 83 minutes of video footage was captured using a Deep Trekker Revolution ROV. The most common benthic feature other than sand were a few gorgonian skeletons and approximately 20 were observed.

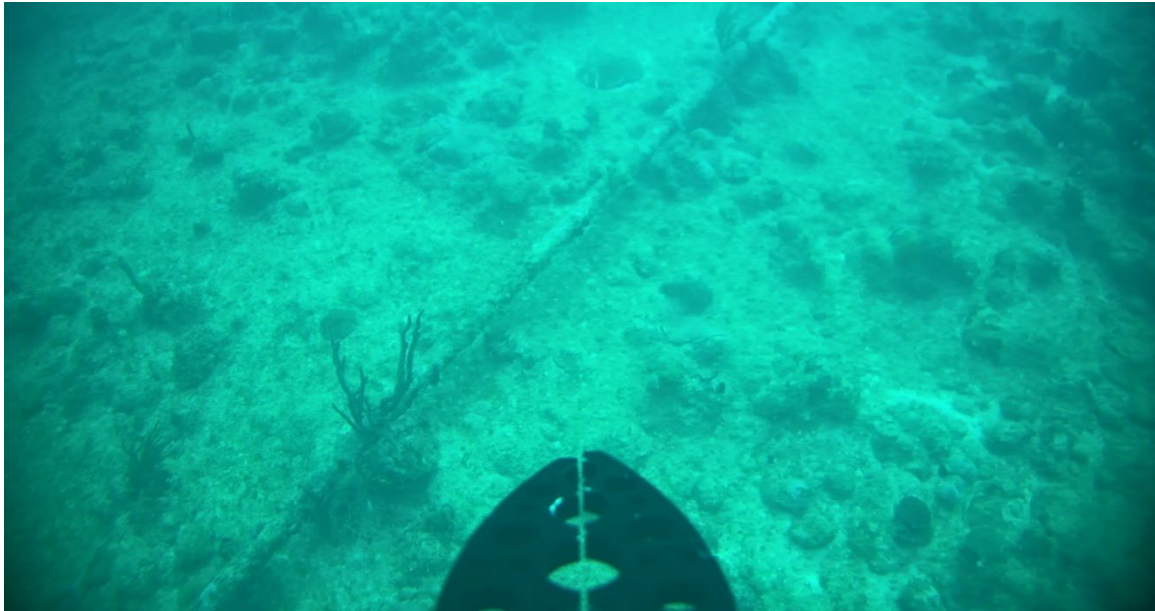


Figure 6.06.9 – Frame grab of video from ROV at area between GPS 24 and GPS 25 showing existing cable.



Figure 6.06.10 – Typical gorgonian skeleton in 170’ deep water (frame grab from video camera)

2022/11/06 – STT Observations and Notes

Substantial bleaching was observed on almost all hard coral species although some color was visible. It cannot be confirmed visually if it is late bleaching or early recovery. Bleaching was occurring in soft corals as well. The last time bleaching was this pervasive was in 2005 (see graphs on page 3). At the NPS coral monitoring sites around VI National Park in St. John, bleaching combined with the coral disease white plague caused over a 60% decline in coral cover (Ref: Miller, J., et al. "Coral disease following massive bleaching in 2005 causes 60% decline in coral cover on reefs in the US Virgin Islands." Coral Reefs 28 (2009) 925-937). The coral disease white plague has not been a large problem lately, but Stony Coral Tissue Loss Disease (SCTLD) has been extremely virulent and prevalent throughout Florida and the Caribbean causing extensive coral mortality. It is impossible to predict the impact of this SCTLD-environment now combined with bleaching, but it is likely there will be a decline in coral cover from these on-going events. This loss would be unrelated to the cable laying at this time. A new baseline benthic survey should be done during or immediately after the cable laying so that the post-bleaching live coral coverage can be documented as a baseline.

GPS 24- GPS 25 site

Starting at 18.402279 N, -64.953460 W

Benthic cover estimated as follows:

Hard Coral:	4%
Octocorals:	2%
Macroalgae:	10%
Crustose coralline algae:	1%
Sand:	2%
Sponges:	1%
Turf algae:	<u>80%</u>
TOTAL:	100%

Shortly after documenting the immediate area in the middle this hardbottom area, the divers located and followed an existing cable and documented the numerous hard and soft corals and sponges growing directly "ON" the cable. It is our judgement that the corals are scattered enough that the new cable could be laid in the scattered sand channels or through this benthic community without causing damage to existing corals or habitat. This would be best accomplished if the cable laying was guided by divers during the placement and laying of the cable. A new baseline benthic survey should be made during or immediately after the cable lay so that the post-bleaching live coral coverage can be documented as a baseline.

Cable Landing Site in Magen's Bay

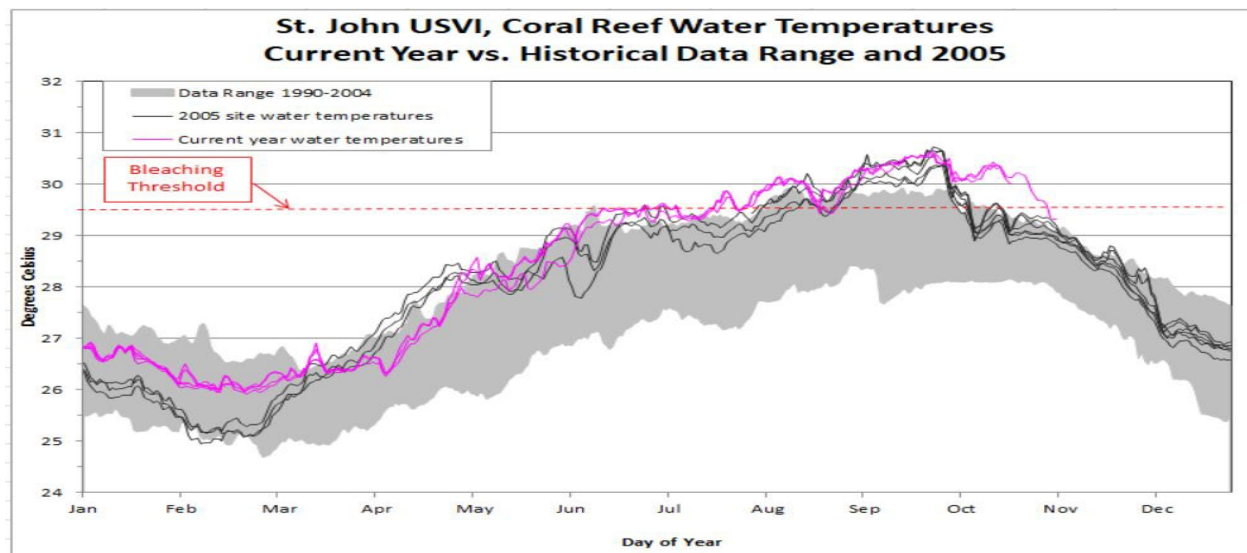
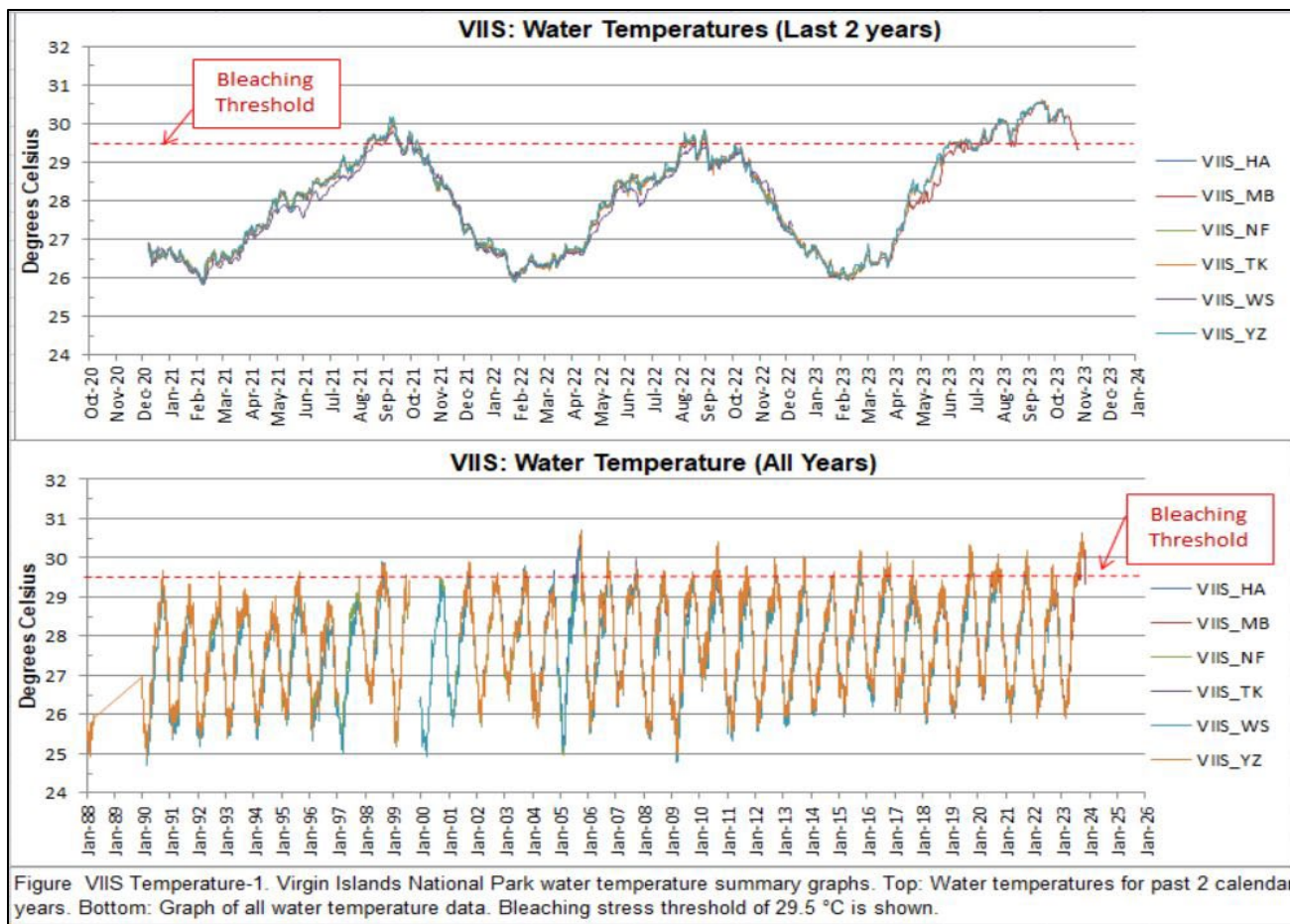
The inspection began at the point where existing cables begin their sharp turn to the north at GPS 50. Benthos is 100% silty mud. Most cables observed (3-4) were suspended above the benthos at this point.

Proceeding towards shore, shallower and upslope, the cables came in contact with a hardbottom community, primarily turf algae, and rose rapidly up to 20' depth.

At that 20' depth, the "shoulder of the slope" was between 20' - 12' where numerous large patch reefs were observed among a scattered coral and rock community. The three (3) *Orbicella* listed species (*O. annularis*, *O. franksi*, *O. faveolata*) were found here. *Orbicella annularis* colonies were abundant and large. The divers swam approximately north and south, parallel to the shoulder of the hardbottom, observing 7-9 existing cables laying among and often over the vibrant coral and fish community. There was evidence of storm damage with some coral colonies toppled, and shore debris (plastic beach chair). Other land-based pollution (bottles, cans, unidentifiable plastic) was also observed.

The overall impression is that the existing cables were laid without regard to the reef community, much of which was composed of coral species listed on the US Endangered Species List (genus *Orbicella*). Future cables would need to be guided through this reef community to avoid contact with existing corals.

In 10 – 12' depth, the hard bottom changed into a sand a seagrass community. The area is dominated by the invasive seagrass (*Halodule stipulacea*). (Ref: Willette, Demian A., Julien Chalifour, AO Dolfi Debrot, M. Sabine Engel, Jeff Miller, Hazel A. Oxenford, Frederick T. Short, Sascha CC Steiner, and Fabien Védie. "Continued expansion of the trans-Atlantic invasive marine angiosperm *Halophila stipulacea* in the Eastern Caribbean." *Aquatic botany* 112 (2014): 98-102.) The brown macroalgae (*Dictyota* spp.) was mixed among the invasive seagrass. This algae genus was not observed in 2022 in this area. Occasionally, native turtle grass (*Thalassia testudinum*) was observed. A Green Sea turtle (also on the ESA species list – *Chelonia mydas*) was also observed during this dive. Laying a new cable through this community would cause minimal disruption if placed by divers.



MAJOR WATER PERMIT APPLICATION

Environmental Assessment Report

Applicant: Trans Americas Fiber (TAF) U.S., LLC.

December 2023

6.07 Terrestrial Resources

The project does not intend to conduct any major construction, earth change, grading or digging for this project within the property or easement to shore. A manhole transition structure will be constructed at the shoreline to connect the submarine cable underground to the existing conduit with existing cables.

An existing conduit will be used to winch the cable through the easement and to the telecommunications building.

A review of the landside area of this project, which includes the shoreline transition, the public road and shoulders, and the project property itself was conducted to assess potential terrestrial resources that may be affected by the project. All terrestrial areas that will be within the project boundaries are already developed, or will not be touched, with the exception of the shoreline manhole.

Adjacent to the property, and within the property itself are several acres of brushland. However, these areas will not be removed or trimmed in the course of installing the cable. No observed wildlife or plant species were observed in the project area.

The ESI Map and IPaC assessment tool note potential nesting beaches for endangered and threatened species of sea turtles along the inner-most beachline of the bay. While the shoreline transition point is outside this area, it will require evaluation for signs of nesting before construction commences.

Particularly near the coast, it is necessary to consider temporal changes to habitat and wildlife patterns since many areas are habitats of species at certain times of the year that react sensitively to disturbances. These include resting grounds during bird migration, wintering and molting areas, feeding and coastal breeding habitats, and migration of sea turtles and sea mammals (OSPAR 12/22/1, Annex 14).

6.08 Wetlands

The U.S. Army Corps of Engineers defines wetlands as "those areas that are periodically inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, bogs, marshes and similar areas." (Environmental Laboratory, 1987).

There are no terrestrial wetlands within or near the project area.

6.09 Rare and Endangered Species

The known rare and endangered species identified within the project area are noted in Section 6.06.

The ESI map indicated variety of marine and terrestrial species including crab, waterfowl, wading birds, seabirds, and shorebirds. Of the bird species, three are considered endangered by the state including the Caribbean Coot (*Fulica caribaea*), ruddy duck (*Oxyura jamaicensis*), and white-cheeked pintail (*Anas bahamensis*) all of which breeds and nests all year round.

Furthermore, there are indicators of fish, octopus, gastropod (i.e., conch), lobster, and dolphin and whale present in nearshore and shelf waters, such as closer to Outer Brass Island near the cable route. Of the

whale species, the humpback whale is considered federally endangered, breeding near these waters around the months of November to May.

In addition, two plant species considered endangered, the *Manilkara bidentata* and the *Tillandsia lineatispica*, were noted on the ESI near the vicinity of the project area. Both the ESI map and the U.S. Fish & Wildlife Information for Planning and Consultation (IPaC) website tool indicates that the hawksbill sea turtle (*Eretmochelys imbricata*), the leatherback sea turtle (*Dermochelys coriacea*), green sea turtle (*Chelonia mydas*), loggerhead sea turtle (*Caretta caretta*), and the Olive Ridley sea turtle (*Lepidochelys olivacea*) have been spotted swimming in the waters of Magen's Bay directly adjacent to the project area and further out. These species are listed as endangered and/or threatened on both the state and federal lists.

The IPaC webtool indicates that the West Indian Manatee (*Trichechus manatus*), a threatened species, has been found in the waters near the project site and the Virgin Islands Tree Boa (*Chilabothrus granti*) as an endangered species of reptile in the area.

In-water work will require a Water Quality Monitoring Plan that includes mitigation for sea turtles that may also be impacted by vessels and cable placement during construction. During construction of the project in order to minimize and abate impacts to the listed turtle species, NMFS's construction conditions will be followed.

To avoid and minimize injury or death to marine mammals and sea turtles, the following NMFS measures from the Vessel Strike Avoidance Measures and Reporting for Mariners will be implemented by all vessels associated with the project construction. All divers, captains and workers assisting during the in-water installation portions will be trained on the following:

1. Vessel operators and crews should maintain a vigilant watch for marine mammals and sea turtles to avoid striking sighted protected species.
2. When whales are sighted, maintain a distance of 100 yards or greater between the whale and the vessel.
3. When sea turtles or small cetaceans are sighted, attempt to maintain a distance of 50 yards or greater between the animal and the vessel whenever possible.
4. When small cetaceans are sighted while a vessel is underway (e.g., bow-riding), attempt to remain parallel to the animal's course. Avoid excessive speed or abrupt changes in direction until the cetacean has left the area.
5. Reduce vessel speed to 10 knots or less when mother/calf pairs, groups, or large assemblages of cetaceans are observed near an underway vessel, when safety permits. A single cetacean at the surface may indicate the presence of submerged animals in the vicinity; therefore, prudent precautionary measures should always be exercised. The vessel should attempt to route around the animals, maintaining a minimum distance of 100 yards whenever possible.
6. Whales may surface in unpredictable locations or approach slowly moving vessels. When an animal is sighted in the vessel's path or in close proximity to a moving vessel and when safety permits, reduce speed and shift the engine to neutral. Do not engage the engines until the animals are clear of the area.

There may be a requirement for pinning or anchoring the cable in hardbottom areas, though it is anticipated these sections will comprise a very small percentage of the total cable path, less than 2.4%.

Sound in water moves four times faster than in air, and attenuation (sound dissipation) is much lower in water than air. Esonification of the marine environment can have a negative impact on sea turtles, marine mammals and fish. To minimize noise impacts to these species a vibratory hammer will be used to drive pins or anchors wherever possible. Vibratory hammers are recommended by NOAA as they have a lower acoustic impact.

6.10 Air Quality

No effects to air quality are anticipated as a result of the proposed project. There is no anticipated earth movement, and the use of vessels or heavy equipment in near-shore waters will be minimal.

7.00 IMPACT OF THE PROPOSED PROJECT ON THE HUMAN ENVIRONMENT

7.01 Land and Water Use Plans

The project will be connecting to existing infrastructure, following a similar approach and pathway as existing telecommunication cables. It will enter through the same transition point, installed into a new manhole structure, and be winched through an existing conduit to an existing building. No visual changes, expansion of the property or business, or change to land cover/use is anticipated, and no changes to any future land or water use plans is anticipated.

7.02 Visual Impacts

The project location is currently an AT&T telecommunications station, and the proposed project will connect an additional cable to existing underground conduit through the construction of a shoreline manhole structure. This structure will have little to no effect on the current aesthetics as this structure will be nearly flush with the surface and be minimally sized for simple access.

7.03 Impacts on Public Services and Utilities

a. Water

As noted in Part 6.04, the project will not use nor affect significant amounts of water, either from public supply or otherwise. No municipal water sources exist in this area, and the project will have no negative impact on the availability of public water.

b. Sewage Treatment and Disposal

There are no public sewage utilities in the area. The project will not affect the amount of sewage generated in the area. No expansion of the business or structures is anticipated, and the additional cable installation is not anticipated to change the staffing needs or expectations in the building.

c. Solid Waste Disposal

Domestic solid waste will be managed with onsite waste bins. It will be trucked out by a licensed waste hauler as necessary and disposed of in accordance with local and federal solid waste requirements.

d. Roads, Traffic, and Parking

During the proposed work, an insignificant number of additional vehicles will use the main road leading to the project site, Peterborg Road as part of construction. This will only be routine traffic to and from the work site. During project implementation, vehicles will be parked in the private lot on the subject

property, owned by AT&T of the Virgin Islands, Inc., where the project is located, and is not anticipated to change.

e. Electricity

There are no proposed electrical systems required for the cable line installation. All existing electrical needs for system capability are already provided at the site.

f. Schools

There are no anticipated adverse effects on the local educational system during project implementation. Ultimately, there will be no effect to the schools in the long term. A positive long-term affect will be better communication technology and infrastructure for all residents, including school-age children to be better connected to the world outside of St. Croix, USVI.

g. Fire and Police Protection

Any nighttime work will provide adequate lighting for worker safety. In the case there is an emergency, the Omar Brown Sr. Fire Station and the Virgin Islands Police Department are located less than four miles from the project site. There are several parking spots on-site for emergency vehicles, if needed.

There are no anticipated long-term burdens or increase in fire or police services. The facility is fenced and gated, and under 24-hour security, and will not change post-construction.

h. Public Health

The project will not have any adverse effect on public health, nor increase the use of public health facilities.

7.04 Social Impacts

This project has the potential to achieve a greater flow of information through public services and utilities that rely on higher telecommunication reliability thus benefiting the social lives of their consumers. Overall, it helps with the development of a regional sense of community through greater equality of information sharing across geographical regions and across groups in society.

7.05 Economic Impacts

The most notable effect is the increase in productivity and capacity. This is due to the level of individuals and organizations generated by advances in communications, connectivity and efficient access to information. Increased telecommunications in the region can create substantial amounts of consumer surplus and generate new employment opportunities particularly in remote areas as it enables a large number of workers to work from home (i.e. telecommuting) and thus reduces the challenges that come

with distances. For existing businesses, more transmission for data and voice call can result in an improvement of business performance as well as create opportunities for expansion.

7.06 Impacts on Historical and Archeological Resources

The project boundaries will be restricted to only areas that have already been evaluated and found to contain no notable archaeological resources or findings, and therefore is not expected to have any negative impact on Historical or Archaeological resources of the USVI. Should any suspected or known resources or artifacts be discovered during the development of the site, the developers will immediately notify the State Historical Preservation Offices to evaluate the findings.

7.07 Recreational Use

The project itself will not inhibit nor promote recreational activities in the vicinity of the project. The Environmental Sensitivity Index Map provided in Section 6.06 (Figure 6.06.1) indicates recreational fishing is a popular activity in the vicinity of the proposed project. Placement of cable on the surface of the seafloor may leave potential for impacts from fish pots, boat anchors or other impacts caused by fishing or boating activities. However, existing cables have run through this area for years and the potential impacts are low and not anticipated to hinder the recreational use of the area.

7.08 Waste Disposal

Any and all construction debris will be collected in appropriate roll-off containers to be transported and disposed of by a licensed waste-hauler, in accordance with solid waste requirements. Any unused or contaminated chemicals or materials will be disposed of in accordance with waste handling regulations.

7.09 Accidental Spills

Spills are not anticipated for this project. Any vessels used to guide and place cable in shallow water will be monitored for any potential spills of oil or fuel. Lubrication or chemicals will not be used for this project as an existing bore will function as the route for the cable, and drilling is not required.

7.10 Potential Adverse Effects which cannot be Avoided

The laying of cables, both telecommunication, power, or other utility types, can cause temporary damage, displacement, disturbance or stress to the seabed and marine flora/fauna, increased turbidity, and potentially release contaminants and cause alteration of sediments (Figure 7.10.1). Seabed disturbance that may impact benthic organisms can be controlled through the use of turbidity curtains and careful and methodical cable placement, but even with a high level of care, sediment plumes within the project area are expected and cannot be eliminated.

Underwater noise is most relevant for marine mammals, though may affect fish and benthic habitat. While use of low impact equipment to minimize noise will be essential, elimination of all noise or impact from

sound is unavoidable. Care to ensure all sensitive wildlife is outside the project impact area will be employed to ensure a minimization of negative impact.

The cable is anticipated to self-bury over time but will still be visible in areas with hard substrate. The visual impact will be minimal to both recreational users and marine habitat but will not be eliminated as the proposed approach is to not bury the cable.

Phase	Installation, maintenance, repair work and removal	Operational phase
Submarine Telecommunication cable	Seabed disturbance	Introduction of artificial hard substrate
	Damage/disturbance of organisms	
	Re-suspension of contaminants	
	Visual disturbance	
	Noise (Vessels, laying machinery...)	
	Emissions and wastes from vessels	

Figure 7.10.1 – Main Environmental Impacts Associated with Submarine Cables (IXSUREVEY, 2010)

These effects are mainly restricted to the installation, repair works and/or removal phase and are generally temporary. In addition, their spatial extent is limited to the cable corridor. Some mobile benthos can avoid disturbance, but smaller benthic communities may be impacted in the short-term. The duration, spatial extent and level of suspended sediment associated with route clearance and cable installation in this project are unlikely to cause such problems with turbidity and water clarity (IXSUREVEY, 2010). Nevertheless, turbidity levels will be minimized during cable lay operations by minimizing the duration and extent of physical seabed disturbance with the use of turbidity curtains and an efficient work schedule.

At the landing location there will be a small amount of construction work and environmental impact associated with the cable installation and construction of the onshore facilities. Much of this impact will be typical of general construction activity, resulting in short term waste generation and nuisance impacts (Noise, air quality, etc). (IXSUREVEY, 2010).

8.00 MITIGATION PLANS

There is no anticipated loss or damage to sea life, benthic or otherwise, and no mitigation plans are needed for this project and operation.

9.00 ALTERNATIVES TO PROPOSED ACTION

The telecommunications needs of St. Thomas, the USVI and the world are expanding and increasing due to increased number of and reliance on services that require high-speed internet. The current telecommunication bandwidth is currently limited and in a do-nothing scenario will soon be a limiting factor in productivity of the St. Thomas community. As computer use increases, both in the population as well as percentage of individual use, reliability and stability of the network will start to decrease, and network speeds will reduce. Assuming that no other cable was installed, in this scenario the region would continue to be constrained by the lack of telecommunications capacity. The demand for capacity would continue to grow along with the overall economic growth (IXSSYSTEM, 2010)

Another alternative is to use wireless ways to increase bandwidth and the telecommunication system on the island, such as satellite or microwave tower transmissions. However, the use of fiber optic networks has a number of advantages over satellite and microwave transmissions. Radio has largely been phased out due to restricted bandwidth and poor data transmission while modern fiber optic networks transmit high volumes of voice and data traffic with higher security and reliability and at lower cost than satellite systems. Cable also has a more dependable installation and repair record. Bandwidth demand, particularly as a result of internet activity far exceeds satellite capacity (Hogan and Hartson, 1999).

An alternative to the placement of the existing cable is to install in another location that has little to no benthic life on the seafloor, and little to no critical areas for protection of environmental resources or recreational uses. However, that would require the installation of new bores, or construction of some form of shoreline transition structure, as well as all new shoreline infrastructure and buildings to house the land hub that would connect to the existing telecommunications system. The massive increase in construction and/or drilling and digging requirements will far outweigh the small and temporary impact to marine life found in the project area and cable path proposed.

Lastly, burying the cable along the entire route as opposed to surface placement was considered. This would require, however, more seafloor disturbance, first by ROV in deeper waters, and then by divers assisted by equipment to dig, cut or bore a trench to bury the cable along the intended path. This would increase suspension of sediments and construction time significantly, for a small benefit of having the cable buried. With careful placement of the cable, and pinning or anchoring where necessary, there is no anticipated impact in the long-term of having an exposed cable.

10.00 RELATIONSHIP BETWEEN SHORT & LONG TERM USES OF MAN'S ENVIRONMENT

The cable is designed, and path planned to have the least amount of impact to marine life, environmental resources and recreational uses. Most of the impacts will be temporary and short term during the placement and installation of the cable and pinning or anchoring for long term use. Once in place, the cable will require minimal to no maintenance, and have no effect on existing or future marine or terrestrial habitats in the project area. As a result of this project, St. Thomas will have a significant improvement to the existing telecommunication capabilities with minimal impact to existing natural, cultural or functional resources of the island.

11.00 REFERENCES

USGS – topoView map generator - <https://ngmndb.usgs.gov/topoview/viewer>

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