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REPORT OF A STAGE 1A MARINE ARCHAEOLOGICAL SURVEY OF THE
VIRGIN ISLANDS PORT AUTHORITY DREDGE AND FILL PROJECT AT
LIMETREE BAY, SOUTHSORE ST. CROIX

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ABSTRACT

The proposed dredging and dock construction in Limetree Bay on the south shore of St. Croix by the Virgin Islands Port Authority will disturb approximately 14 acres of seabed. The Virgin Islands Coastal Zone Management Commission's and the Army Corps of Engineers' requirements for an Environmental Assessment Report (EAR) include antecedent archaeological investigations to assess the potential impact of the proposed project on submerged cultural resources.

Accordingly, the Virgin Islands Port Authority contracted with the Island Resources Foundation of St. Thomas to conduct a Stage 1A Marine Archaeological Survey of the project area.

The survey, carried out by the Island Resources Foundation in March, 1987, under the direction of Mr. Roger Smith, a professional marine archaeologist associated with the Institute of Nautical Archaeology at Texas A & M University, consisted of background research utilizing historical documents and maps, and a visual field investigation covering 100% of the project area, supplemented by limited remote sensing.

While background research located reports of two mid-nineteenth century shipwrecks in the general vicinity of the project area, and field survey found several assemblages of modern cultural debris, NO SIGNIFICANT CULTURAL RESOURCES WERE FOUND IN THE PROJECT AREA BY THIS SURVEY. Since the field survey was primarily visual, it is possible that other cultural remains may lie buried beneath the seabed, but this possibility is considered very remote.

Given these considerations, NO FURTHER ARCHAEOLOGICAL STUDY OF THE PROJECT AREA IS RECOMMENDED.

Report of a Stage 1A Marine Archaeological Survey of the
Virgin Islands Port Authority Dredge and Fill Project At
Limetree Bay, Southshore St. Croix

BACKGROUND

Project Description

The project site, hereafter termed the Study Area, is located at Limetree Bay on the south shore of St. Croix, between the Harvey Channel cut on the west and the Container Port on the east (Figure 1).

As shown by Figure 2, the proposed project involves dredging a rectangular strip of seabed, 1450 feet by 250 feet (hereafter termed Area A), and using the dredge spoil to fill two smaller rectangular areas (hereafter termed Area B and Area C) on either side of an existing breakwater. The filled area on the western side of the breakwater (Area B) is to be used as a dock for ships offloading bulk molasses.

Photograph 1, looking west from the breakwater, shows Area A.

Photograph 2, looking northwest from the breakwater, shows Area B.

Photograph 3, looking northeast from the breakwater, shows Area C.

Study Area Setting and Conditions

The Study Area is located within one of the last surviving nearshore ecosystems associated with the old Krause Lagoon. Its western boundary is formed by the Harvey navigation channel, which has been dredged to a depth of 35 feet. Its northern boundary is defined by the natural shoreline, consisting of a narrow sand beach backed by mangrove stands. The southern and eastern boundaries are displayed in Figure 2.

A breakwater, approximately 50 feet wide and extending approximately 1300 feet southward from the shoreline, bisects the Study Area. Apart from the breakwater, the seabed of the Study Area is more or less undisturbed except for modern debris as noted in the report and displayed in Figure 2.

The Port Authority has recently put in place a silt boom that arcs in a northwest direction from the middle of the breakwater to a point near where the existing shoreline intersects with the Harvey Channel cut (Photograph 4). At the time of our survey this boom enclosed approximately 50% of Area B and 10% of Area A.

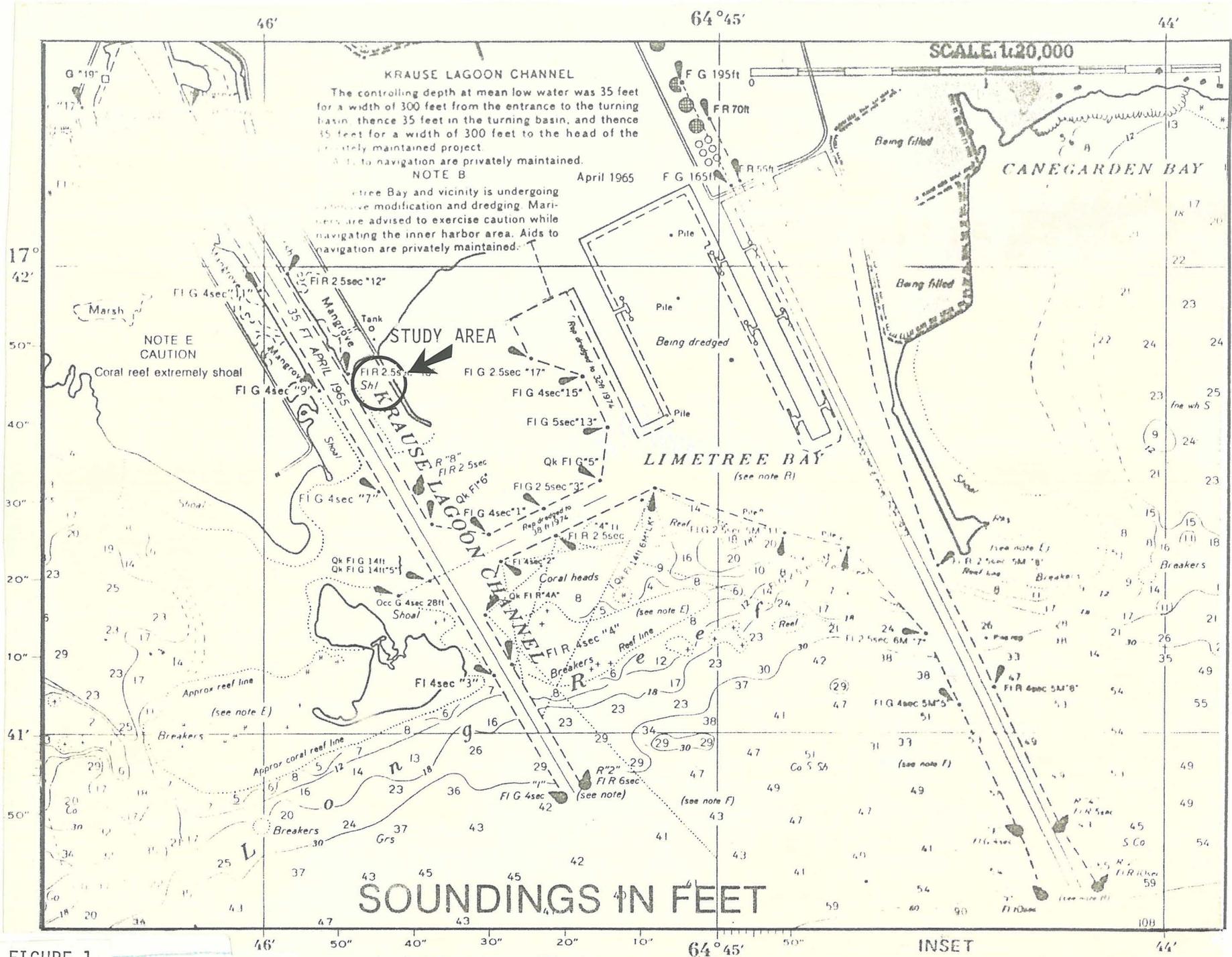


FIGURE 1.

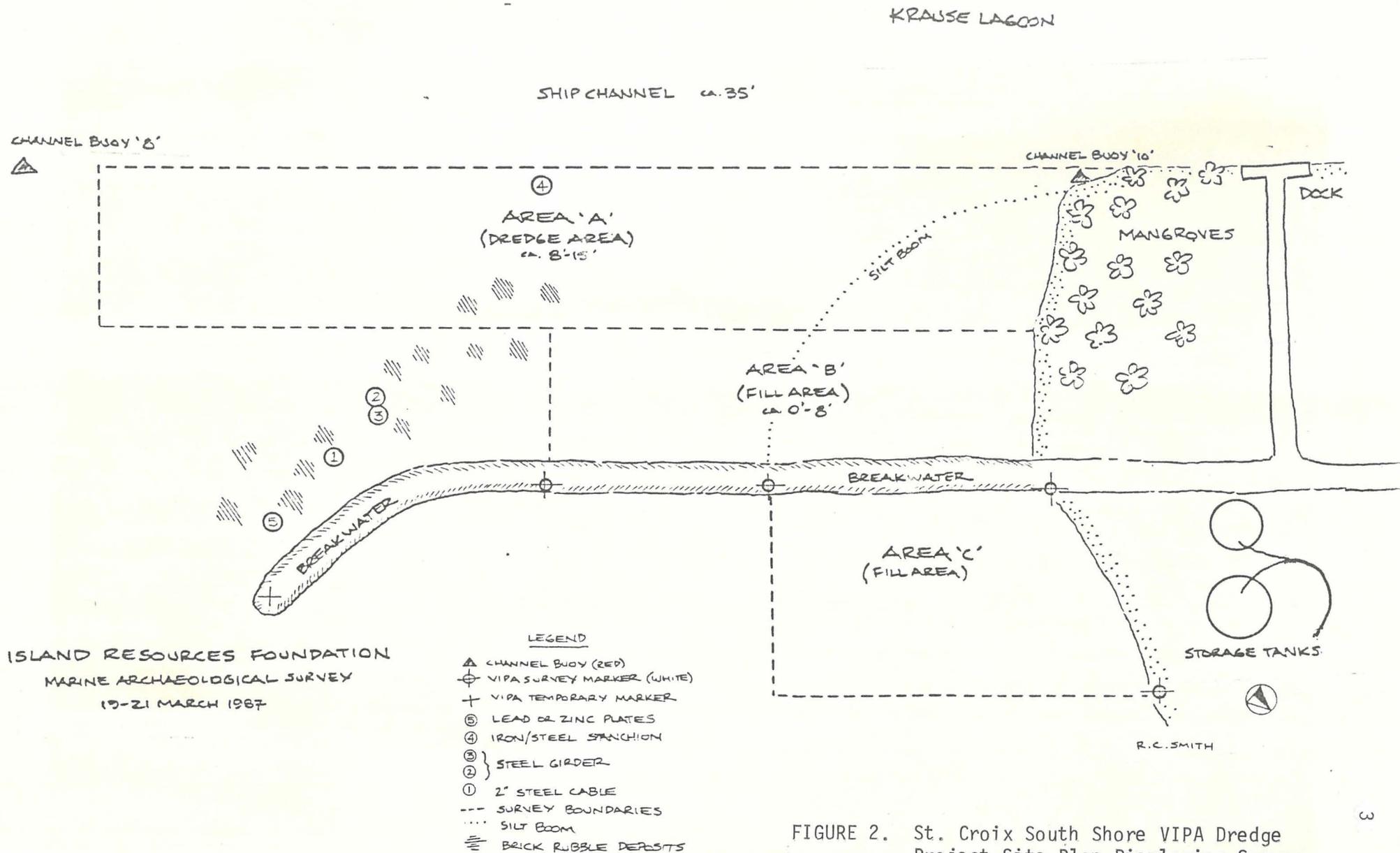


FIGURE 2. St. Croix South Shore VIPA Dredge Project Site Plan Displaying Survey Areas, Boundaries and Debris Locations.

Water depths range from zero along the shoreline, to 15 feet at the edge of the Harvey Channel cut. The bottom is characterized by stands of turtle grass (*Thalassia*), calcareous algae (*Halimeda*), with an underlying strata of sand and silt. Visibility ranged from 2 feet to 25 feet. Visibility was generally good throughout the Study Area, but became poor along the eastern edge of the breakwater in Area C.

The Study Area is protected from heavy seas by Long Reef, an extensive coral reef system, approximately 800 yards to the south. During the survey, moderate to light winds blew from the east and southeast. Overall conditions were conducive to utilizing visual survey techniques.

SURVEY METHODOLOGY AND FINDINGS

The purpose of this Stage 1A Marine Archaeological Survey was to determine the potential of the proposed Port Authority project to impact significant prehistoric or historic cultural resources. Investigations involved conducting a background study utilizing available documentation, charts and aerial photographs, and a field survey of 100% of the Study Area, including the shoreline.

Literature and Cartographic Review

The Study Areas is located in the South-Central Coastal Terrace of St. Croix, which is not known to have been permanently inhabited during the aboriginal era. Two small prehistoric sites (SC-38 and SC-45), have been documented on either side of the Krause Lagoon, but these are little more than camp sites. The large and important Fair Plain Site (SC-10) lies in a different ecotone to the northeast (Tyson and Figueredo, 1984). While it is certain that prehistoric peoples harvested fish and shellfish in and offshore the Krause Lagoon, available environmental and archaeological evidence indicates that its shoreline would have been an unattractive settlement area.

The Lagoon "wetlands" ecosystem and adjacent coral reef barriers also discouraged historic coastal settlement and navigation. The entire shoreline between Fair Plains Creek and the old Limetree Bay, including the Study Area, is shown as uninhabited by a series of historic maps: Blondel (1667); Beck (1754); Kusner (1767); Oxholm (1794); Parsons (1856); and USCGS (1919). The nearest plantation sites to the Study Area - Anguilla, Caramaw Hall, Blessing and Hope - were all located well north of the Lagoon shoreline. And, it is highly unlikely that the Study Area shoreline was used for even minor marine activities, such as careening, docking or boat building.

While the Admiralty chart prepared by Parsons in 1856 (Figure 3) shows an anchorage immediately southwest of the Study Area, most coastal shipping would have stayed well south of Long Reef. And shipwrecks of large oceanic vessels would most likely have occurred on the offshore reefs. However, shipwrecks cannot be ruled out, since small island sloops and droghers certainly penetrated the reefs on a regular basis in order to take on produce from southside sugar plantations.

To determine if any vessels have been recorded as having wrecked in the Study Area, the REGISTER OF VIRGIN ISLANDS SHIPWRECKS (1523-1917) prepared by George F. Tyson Jr., for the Division of Archaeology and Historic Preservation, Virgin Islands Planning Office (Tyson, 1983), was consulted. This Register, which is based on extensive archival research in a variety of primary and secondary sources, identifies almost 700 shipwrecks as occurring in waters surrounding the U.S. Virgin Islands and British Virgin Islands. It is the most comprehensive, up-to-date listing of Virgin Islands shipwrecks, subsuming information found in earlier inventories, such as that prepared by Marx and Towle (1971).

The Register lists a total of 124 wrecks that occurred around St. Croix, 11 of which are reported for the south side of the island. Of the south side wrecks, the location of seven is specified. Two of these occurred in the vicinity of the Study Area. On January 18, 1850 the DOW H. ROOP, a British brig with a cargo of foodstuffs, lumber and tobacco, sunk off Estate Anguilla. In December 1863, an unnamed sloop wrecked on a reef opposite Estate Blessing. It is also possible that one or more of the four, south side shipwrecks whose location is not specified may have occurred in the Study Area.

Examination of aerial photographs of St. Croix taken in 1954 and 1962 showed no evidence of shipwrecks or other historic features in the Study Area.

Field Survey Methodology

The Field Survey took place on March 19-20, 1987. Its primary objective was to locate remains associated with either of the two shipwrecks documented for the general area. The survey team, consisting of Roger Smith, George Tyson, Henry Tonnemacher, and James Halperin, spent a total of 34 man hours in the field. One hundred percent coverage of the Study Area was accomplished.

The Study Area was systematically surveyed by two teams of divers employing visual, underwater survey method. This technique, which is comparable to a pedestrian survey on land, involves careful examination of the seafloor and reef

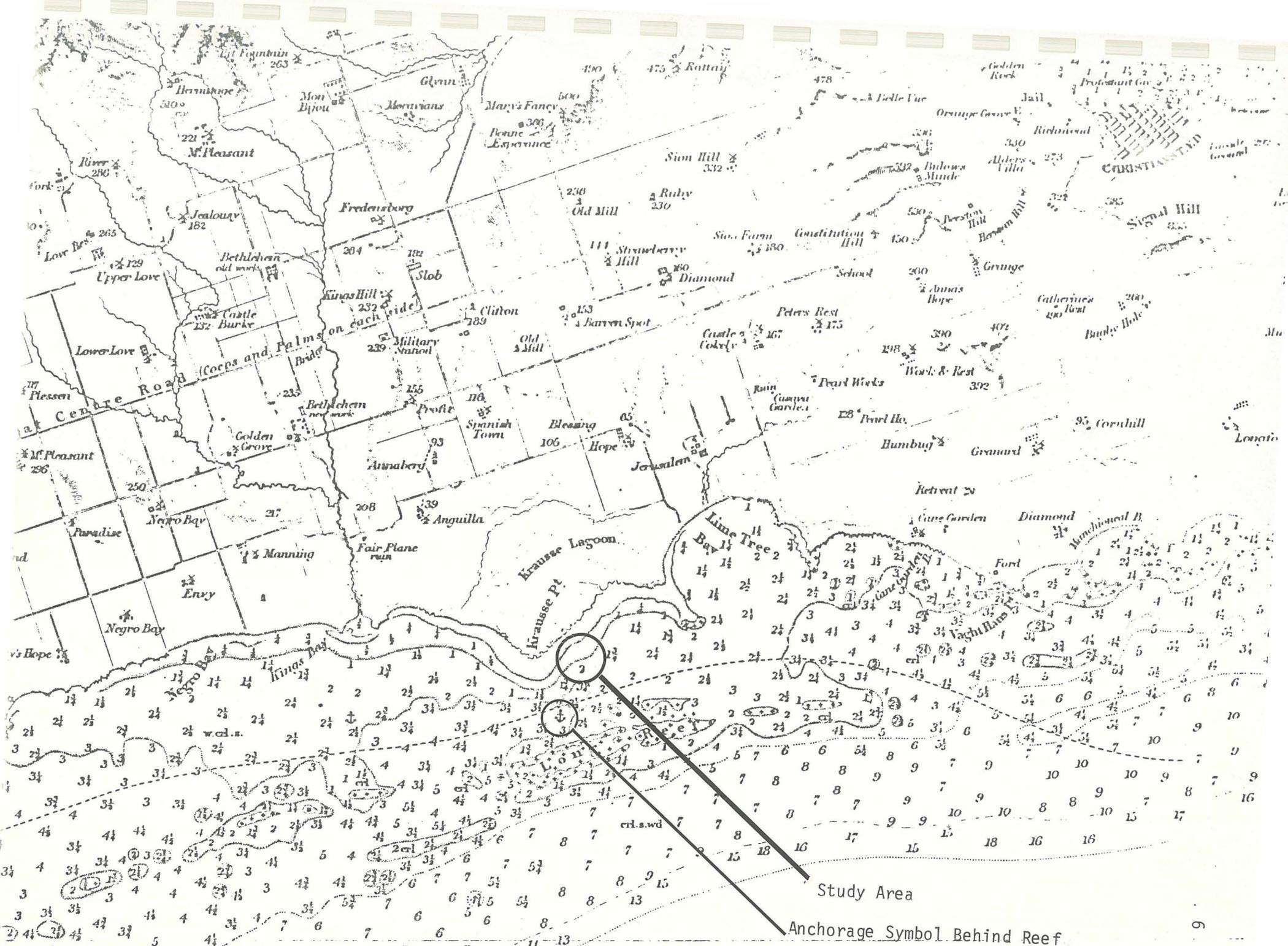


FIGURE 3. Admiralty Chart by Parsons (1856)

systems for the purpose of locating wreckage and/or tell-tale evidence of historic shipwrecks, such as ceramics, glassware, rope, metal objects, wood, anchors, cannon, piles of ballast, rock or brick.

The limitation of the technique is that it cannot identify sites wholly buried beneath the seabed sediments (although dark patches in the sand indicative of iron oxide from any large concentrations of submerged ferrous metal objects might be observed). To help offset this disadvantage the survey team selectively employed a Garrett "Sea Hunter" underwater metal detector, which can locate normal-sized metal objects buried up to 24 inches. A metal probe rod was also utilized in the vicinity of sensitive areas.

Two types of visual survey technique were utilized. Portions of Areas A and B outside the silt boom were surveyed by a team of two divers towed behind a small inflatable boat. To ensure total coverage, the boat operator oriented survey sweeps by taking relative bearings from shoreline features, Port Authority markers and channel markers. The breakwater was used as a constant reference point.

Area C, which was too shallow for small boat operation, and the portions of Areas A and B enclosed by the silt boom, were systematically surveyed by two swimmers spaced from 5 to 10 feet apart. The swimmers also oriented their grid survey by taking relative bearings from shoreline features, Port Authority markers and offshore channel markers.

Upon encountering significant cultural material, survey was stopped briefly and the site marked by a buoy for subsequent detailed inspection. After the gross survey work was completed, the area surrounding each marked cultural feature was then inspected by SCUBA divers, utilizing a metal detector, probes and hand fanning to investigate the nature, spatial distribution and depth of cultural deposits. Significant finds were marked on the bottom, using fluorescent plastic surveyors tape. Running ranges were taken at buoys, marking each significant object, or concentration of objects, to record their relative position. These buoys positions were later established from markers on the breakwater by turning angles from a hand-bearing compass.

After inspection and analysis of cultural deposits and recording of their location, the majority of the buoys were removed. However, five buoys (shown on Figure 2) which marked objects potentially hazardous to dredging activities, were left in place to designate their precise location on the seabed for the benefit of the Port Authority (see Appendix I and Figure 4).

Prior to the survey, the Virgin Islands Port Authority had set boundary markers along the shoreline and breakwater, which consisted of square, white markers erected on two-by-fours about 12 feet high. The Port Authority had also placed a buoy at the extreme southern limit of Area A. When the survey team arrived, the latter marker had disappeared. We therefore decided to use Channel Marker #8, in conjunction with the land markers, to define the southern limit of the survey.

Because of the need to use Channel Marker #8 as a geopositioning reference point, and the need to explore the patterning of seabed cultural remains that we found, the survey actually extended over a somewhat larger area than required. Basically, on the western side of the breakwater, the southern extremity of the survey area was defined by a line extending between the southern tip of the breakwater and Channel Marker #8.

Survey Findings

Survey findings are shown in Figure 2. The portions of Area A and B outside the silt boom were completely surveyed on March 19th by a team consisting of Smith, Tyson and Tonnemacher. Smith and Tyson, spaced 10 feet apart, were slowly towed by an inflatable boat driven by Tonnemacher in a systematic grid pattern consisting of a series of overlapping, north-south sweeps. The survey started along the Harvey Channel cut and moved progressively eastward towards the breakwater.

This survey yielded the following finds:

1. A discarded, modern-boat alternator partially buried in the silt at the edge of the Harvey Channel.
2. Miscellaneous modern refuse, such as beer bottles and cans.
3. An iron or steel girder (I beam), 9.7 meters long, with associated metal material at either end (Photographs 5 - 7). This girder, of modern construction, appears to be an isolated feature.
4. A 2-inch metal rod or piece of cable, protruding from the seabed to a height of about 3 feet (Photograph #8). This object also appears to be an isolated feature.
5. The most interesting and widespread cultural remains encountered were several assemblages of modern bricks, in association with stones and concrete aggregate material (Photographs 9 - 15). As

shown by Figure 2, these concentrations are part of a distribution pattern that extends eastward outside of the Study Area.

Two types of brick were found in these assemblages (Photographs 16 - 17). The first and most common type is rectangular, measuring 23.3 centimeters long, 11.3 centimeters wide, and 6.4 centimeters thick. Some of these bricks were embossed with the label "ALAMO" on their upper face; others were embossed with the label "CLIPPER D.R.," while a few others were labelled "B 62112."

The second type of brick measures 23.3 centimeters long, 17 centimeters wide and 6.4 centimeters thick. These were embossed with the label "CLIPPER" and below it "B-62112." These bricks have two molded indentations on the outer edges of their upper face, each in the form of an incised concave "T."

These indentations probably are mortices for metal fasteners, such as staples, to hold bricks with corresponding features together.

Approximately ninety percent of the bricks encountered were scattered, broken and fragmentary, indicating that they probably were deliberately discarded. All were manufactured with yellowish to buff colored clay, producing an extremely dense, highly fired brick, that exceeds standards for ordinary construction usage. Most likely these are fire bricks intended for some industrial kiln or boiler application, most probably associated with the Harvey Alumina plant, now closed.

The bricks were found in association with a non-uniform, concreted, aggregate material, that may represent some form of mortar or cement. Also found were occasional cobble-sized stones. The origin and purpose of these modern materials cannot be determined at this time.

6. A buried wooden timber, 30 centimeters wide and 10 centimeters thick, in association with a concentration of bricks (Photographs 18 - 20). This timber was cleaned of sediments and partially excavated by hand fanning to a depth of 50 centimeters. It appears to be an isolated feature, since no tool marks or associated fasteners for articulated components, such as other connecting timbers, were encountered.

A systematic, sub-bottom exploration of the surrounding seabed by metal detector produced signals running in a westerly direction from the timber. Limited excavation of this anomaly revealed it to be a segment of two-inch steel cable, completely buried to a depth of 20 centimeters, and running for an approximate length of 7 meters.

7. Six, square, lead or zinc plates, each measuring 30 centimeters by 30 centimeters and 2 centimeters thick, and each having four corresponding bolt holes, were found in association with another concentration of brick rubble (Photographs 21 - 22). These squares probably had an industrial function, since they appear to have been designed to be bolted to a flat surface.

On March 20th, a visual examination of brick and rubble deposits was conducted by Smith and Halperin on SCUBA, employing a metal detector survey and shallow probe to determine the progressive pattern of artifact distribution on the seabed. A particular effort was made to determine if the timber found the day before was associated with a shipwreck. The wooden timber was partially exposed by hand fanning sediments away to a depth of .5m. No associated metal fasteners or articulated structures were found in relation to the timber. Nearby, a buried section of 2-inch wire cable was encountered during the metal detector search. Throughout the survey and examination of the brick deposits, only occasional modern metal debris, such as metal cans, were encountered.

Also on March 20th, Area C and the remaining portions of Area A and B were systematically surveyed in their entirety by a team consisting of Tyson and Tonnemacher. The team swam both areas in a series of overlapping sweeps. Aside from a few incidental bottles and cans, a number of modern engine blocks and other kinds of modern iron debris, no significant cultural materials were encountered in either area.

In addition to the underwater survey, the exposed shoreline on the eastern side of the breakwater, extending approximately 75 meters, was also inspected. No prehistoric or historic cultural remains were observed.

CONCLUSIONS AND RECOMMENDATIONS

Archival research produced no documentary or cartographic evidence of prehistoric or historic sites or usage within the Study Area. Two mid-nineteenth century shipwrecks have been reported in the general vicinity, but their precise location is unknown.

A terrestrial field survey of the shoreline found no evidence of prehistoric or historic cultural remains.

Underwater field surveys yielded no evidence of significant cultural remains, such as a shipwreck. A few assemblages of cultural materials of a modern, industrial nature were encountered within the Study Area. Some of these assemblages were part of a large depositional pattern that extended outside the Study Area. It cannot be determined how or why these materials came to be deposited on the seafloor. It is however, extremely unlikely that they are associated with a shipwreck, due to the absence of ballast, fasteners, timbers or other diagnostic features. Because much of this material is broken or damaged, it is highly probable that it is debris discarded from vessels associated with nearby industrial facilities.

Because of their modern nature, the cultural assemblages found by our survey cannot be considered significant at this time. Moreover, the largest concentrations were located outside of the Study Area. It is possible that undetected archaeological remains lie buried beneath the seabed, but the potential for such sites is minimal, since it is to be expected that such remains would be visible if present, particularly that of a mid-nineteenth shipwreck, in an offshore area of relatively low sedimentation.

Since there is no reason to assume that the proposed project will directly or indirectly impact on significant cultural resources, NO FURTHER MARINE ARCHAEOLOGICAL INVESTIGATIONS ARE RECOMMENDED.

Because some of the submerged cultural materials located by this survey constitute hazards for dredging operations, we suggest that the Port Authority take every precaution to ensure that its dredge stays strictly within the confines of the proposed dredge area, unless it removes the items in question.

REFERENCES CITED

- Marx, Robert and Edward L. Towle. 1971. Shipwrecks of the Virgin Islands (1523-1825). Caribbean Research Institute, College of the Virgin Islands, St. Thomas.
- Tyson, George F., Jr. 1983. Register of Virgin Islands shipwrecks (1523-1917). Compiled for the Division of Archaeology and Historic Preservation, Virgin Islands Planning Office.
- Tyson, George F. Jr. and Alfredo E. Figueredo. 1984. Cultural resource survey of the step project site, Betty's Hope, St. Croix. Prepared for Alton A. Adams, Jr. and Associates, St. Thomas.

APPENDIX I (Part 1 of 2)

DESCRIPTION AND BEARINGS OF BUOYS MARKING POTENTIAL NAVIGATIONAL HAZARDS IN SURVEY AREA

Description

Buoy #1. Two-inch steel cable

Buoys #2 and #3. Steel I-beam girder

Buoy #4. Iron/steel stanchion

Bearings

A. From 3rd (southernmost) white VIPA marker on the breakwater to:

Buoy #1: 175 degrees

Buoy #2 and #3: 185 degrees

Buoy #4: 240 degrees

B. From marker at end of breakwater to:

Buoy #1: 255 degrees

Buoy #2: 260 degrees

Buoy #3: 280 degrees

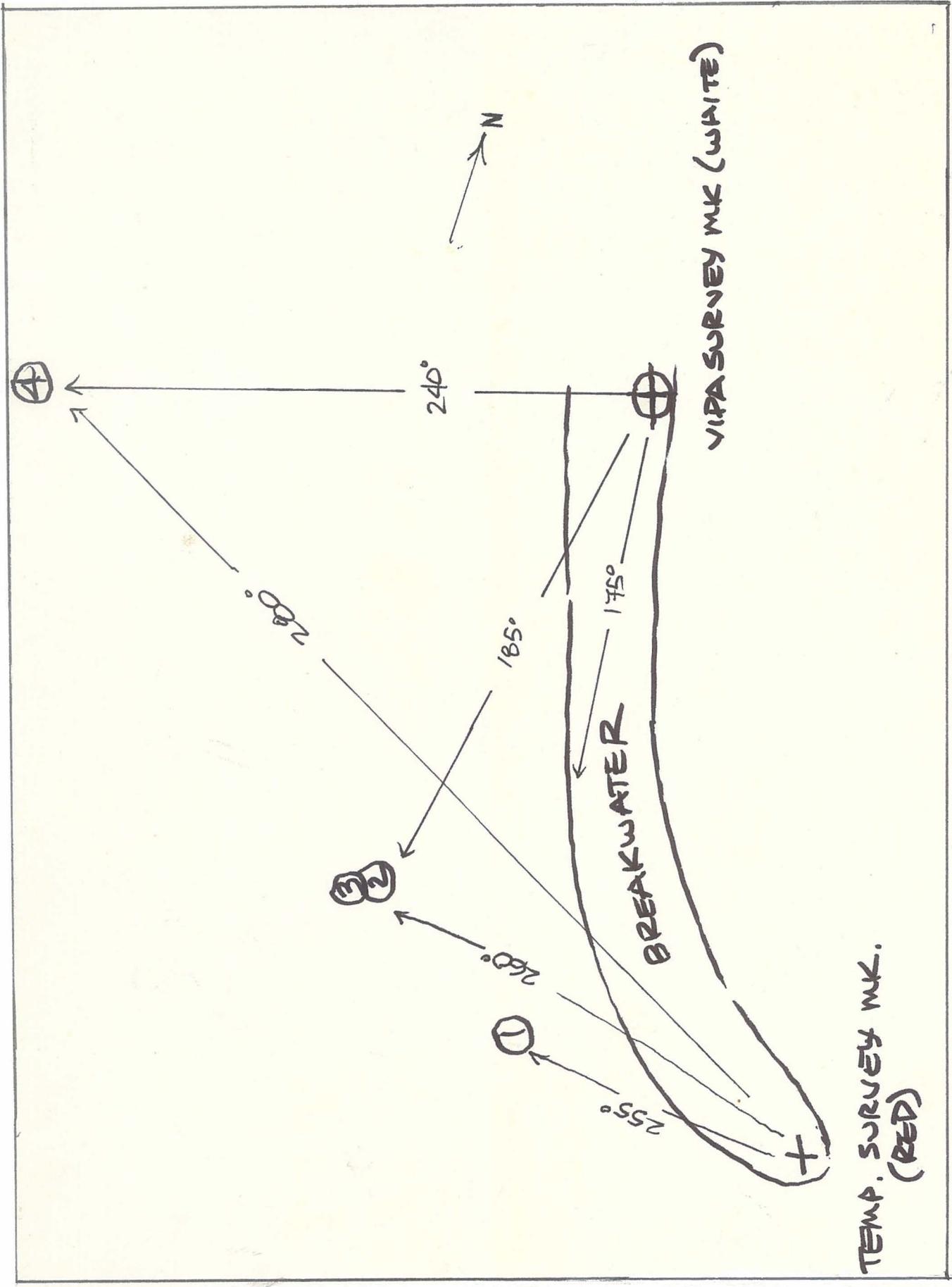


FIGURE 4. Magnetic Compass Bearings of Debris Sites.

APPENDIX II

LIST OF PHOTOGRAPHS

1. Area A
2. Area B
3. Area C
4. Silt Boom
5. Steel I-Beam Girder
6. Steel I-Beam Girder
7. Steel I-Beam Girder
8. Metal Stanchion
9. Brick Assemblage
10. Brick and Aggregate Assemblage
11. Brick Assemblage
12. Brick and Aggregate Assemblage
13. Brick and Aggregate Assemblage
14. Brick and Aggregate Assemblage
15. Brick Assemblage
16. Detail of Bricks and Aggregate Material
17. Detail of Brick and Aggregate Material
18. Buried Timber (after hand fanning)
19. Buried Timber (after hand fanning)
20. Buried Timber (after hand fanning)
21. Metal Plate
22. Metal Plate

Photograph Credit: All underwater photographs taken by
H. Tonnemacher, Project Dive Master.



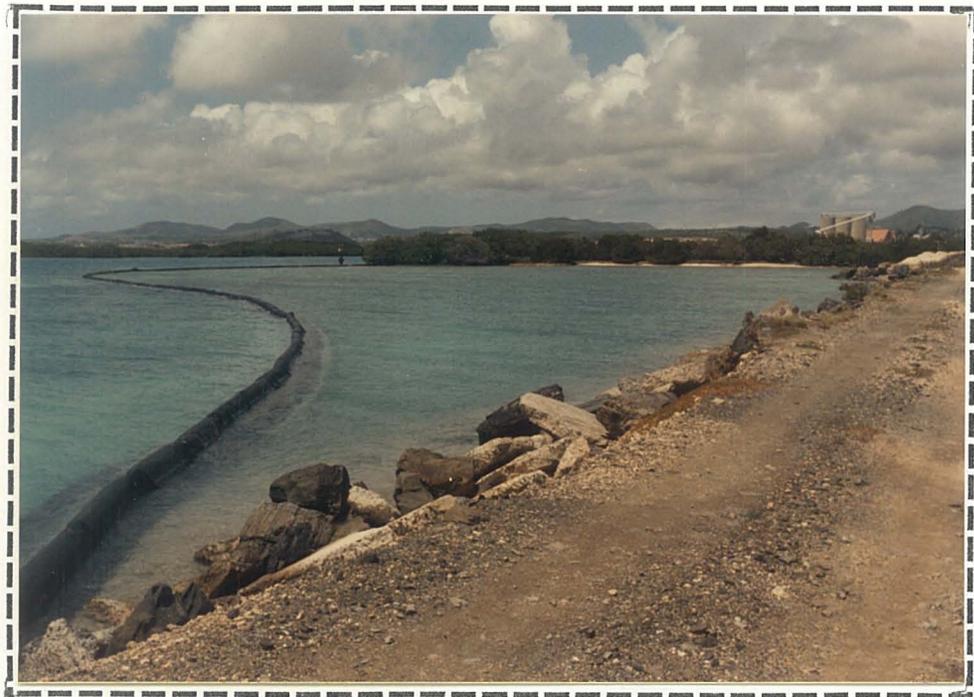
• PHOTOGRAPH #1



• PHOTOGRAPH #2



• PHOTOGRAPH #3



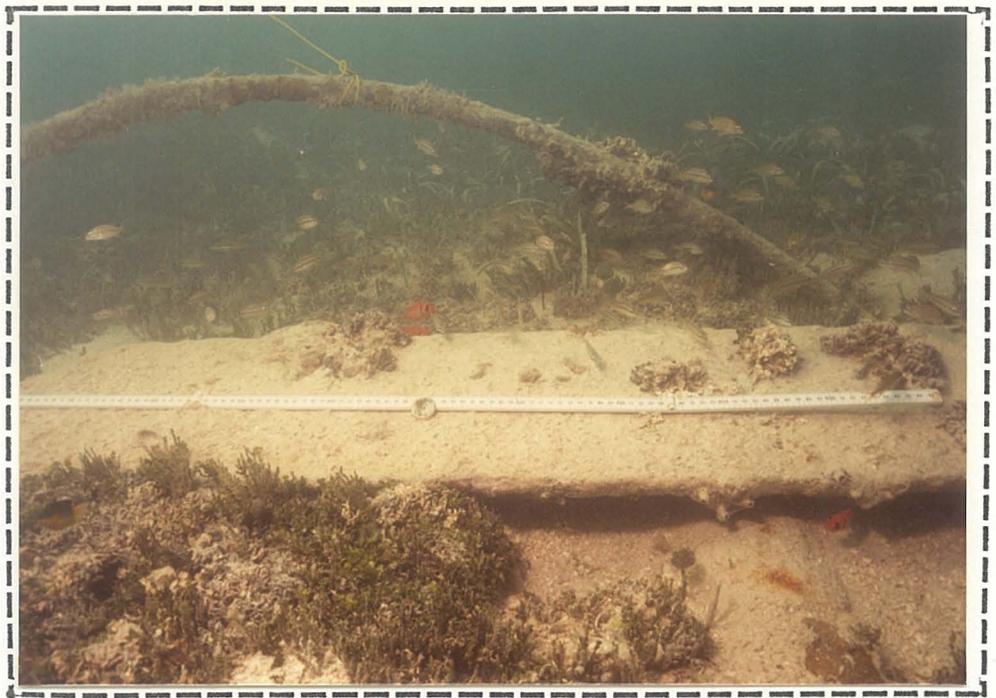
• PHOTOGRAPH #4

• PHOTOGRAPH #5

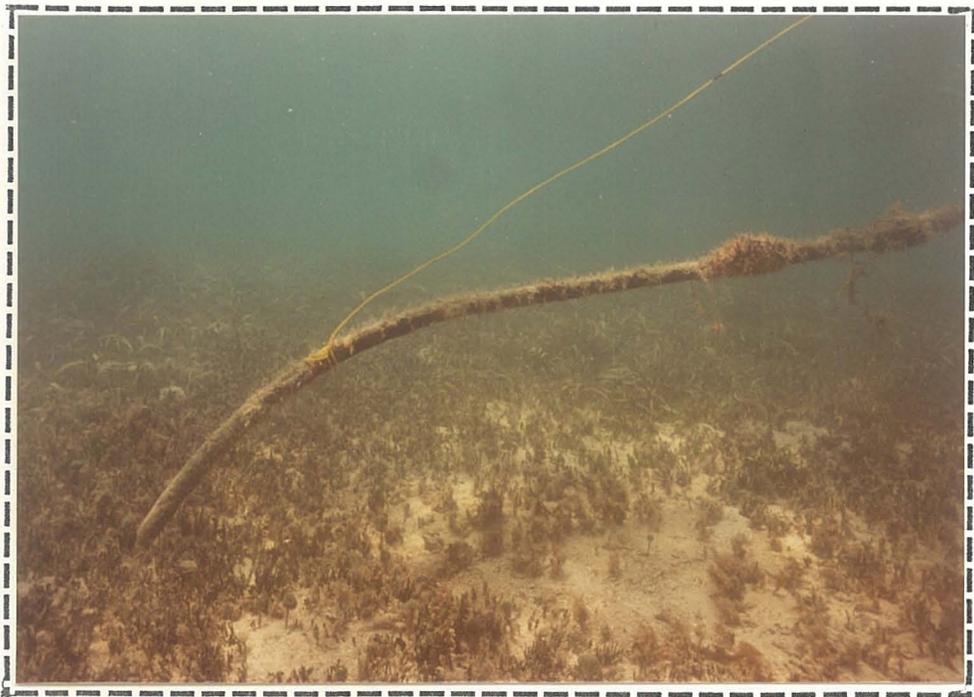


• PHOTOGRAPH #6

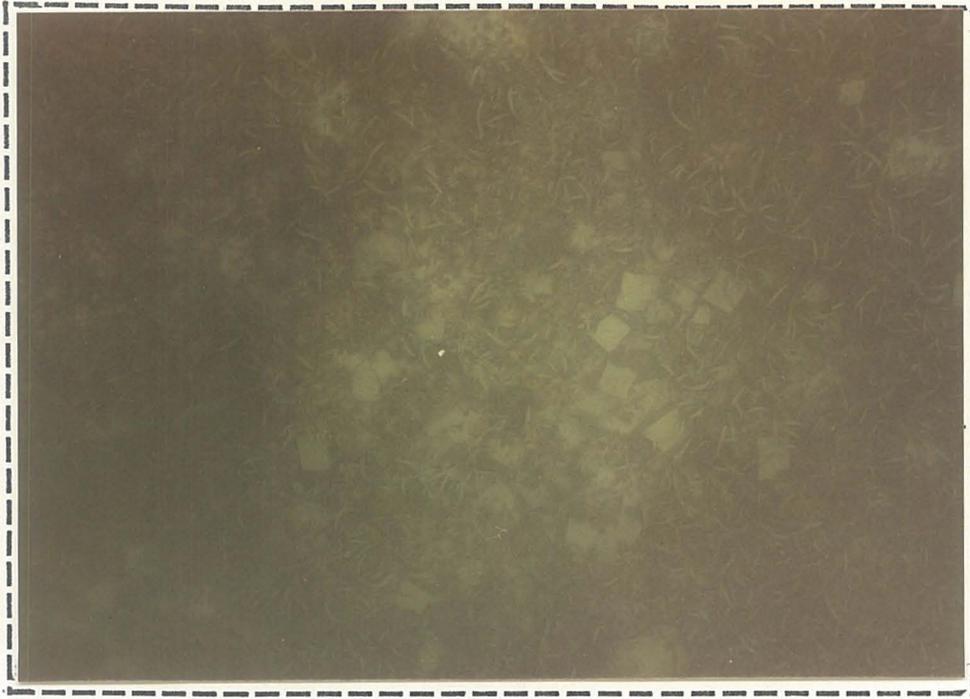




• PHOTOGRAPH #7



• PHOTOGRAPH #8



• PHOTOGRAPH #9

• PHOTOGRAPH #10





• PHOTOGRAPH #11



• PHOTOGRAPH #12



• PHOTOGRAPH #13



• PHOTOGRAPH #14



• PHOTOGRAPH #15

• PHOTOGRAPH #16





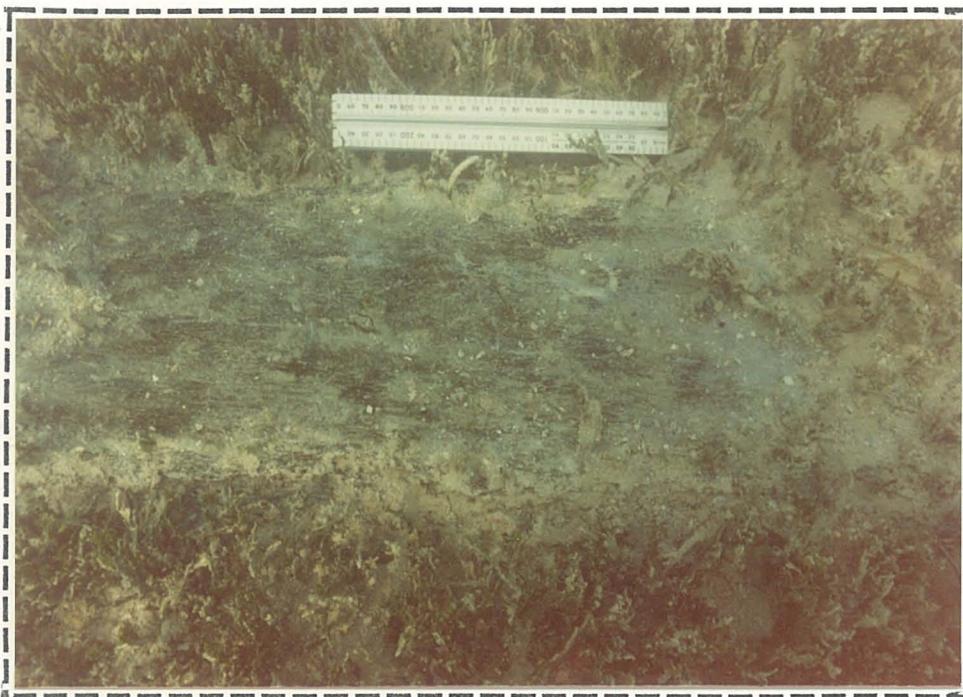
• PHOTOGRAPH #17



• PHOTOGRAPH #18



• PHOTOGRAPH #19



• PHOTOGRAPH #20



• PHOTOGRAPH #21

• PHOTOGRAPH #22

