PUB. 123

SAILING DIRECTIONS (ENROUTE)

★

SOUTHWEST COAST OF AFRICA

★

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Explanatory Remarks

Sailing Directions are published by the National Geospatial-Intelligence Agency (NGA), under the authority of Department of Defense Directive 5105.40, dated 12 December 1988, and pursuant to the authority contained in U. S. Code Title 10, Sections 2791 and 2792 and Title 44, Section 1336. Sailing Directions, covering the harbors, coasts, and waters of the world, provide information that cannot be shown graphically on nautical charts and is not readily available elsewhere.

Sailing Directions (Enroute) include detailed coastal and port approach information which supplements the largest scale chart produced by the National Geospatial-Intelligence Agency. This publication is divided into geographic areas called "Sectors."

Bearings.—Bearings are true, and are expressed in degrees from 000° (north) to 360°, measured clockwise. General bearings are expressed by initial letters of points of the compass (e.g. N, NNE, NE, etc.). Adjective and adverb endings have been discarded. Wherever precise bearings are intended degrees are used.

Coastal Features.—It is assumed that the majority of ships have radar. Available coastal descriptions and views, useful for radar and visual piloting are included in geographic sequence in each Sector.

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Courses.—Courses are true, and are expressed in the same manner as bearings. The directives "steer" and "make good" a course mean, without exception, to proceed from a point of origin along a track having the identical meridianal angle as the designated course. Vessels following the directives must allow for every influence tending to cause deviation from such track, and navigate so that the designated course is continuously being made good.

Currents.—Current directions are the true directions toward which currents set.

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Distances.—Distances are expressed in nautical miles of 1 minute of latitude. Distances of less than 1 mile are expressed in meters, or tenths of miles.

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Heights.—Heights are referred to the plane of reference used for that purpose on the charts and are expressed in meters.

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Radio Navigational Aids.—Radio navigational aids are not described in detail. Publication No. 117 Radio Navigational Aids and NOAA Publication, Selected Worldwide Marine Broadcasts, should be consulted.

Soundings.—Soundings are referred to the datum of the charts and are expressed in meters.

Special Warnings.—A Special Warning may be in force for the geographic area covered by this publication. Special Warnings are printed in the weekly Notice to Mariners upon promulgation and are reprinted annually in Notice to Mariners No. 1. A listing of Special Warnings currently in force is printed in each weekly Notice to Mariners, Section III, Broadcast Warnings, along with the notice number of promulgation.

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NGA Maritime Safety Information Division Website (Special Warnings)
http://164.214.12.145/warn/warn_j_query.html

Wind Directions.—Wind directions are the true directions from which winds blow.

Reference List

The principal sources examined in the preparation of this publication were:

British Hydrographic Department Sailing Directions.

South African Sailing Directions.
Various port handbooks.
Reports from United States Naval and merchant vessels and various shipping companies.
Other U.S. Government publications, reports, and documents.

Charts, light lists, tide and current tables, and other documents in possession of the Agency.

Internet Web site:
Simon Baillie-Cooper and the Lighthouses of South Africa Home Page
http://www.lighthouses.co.za

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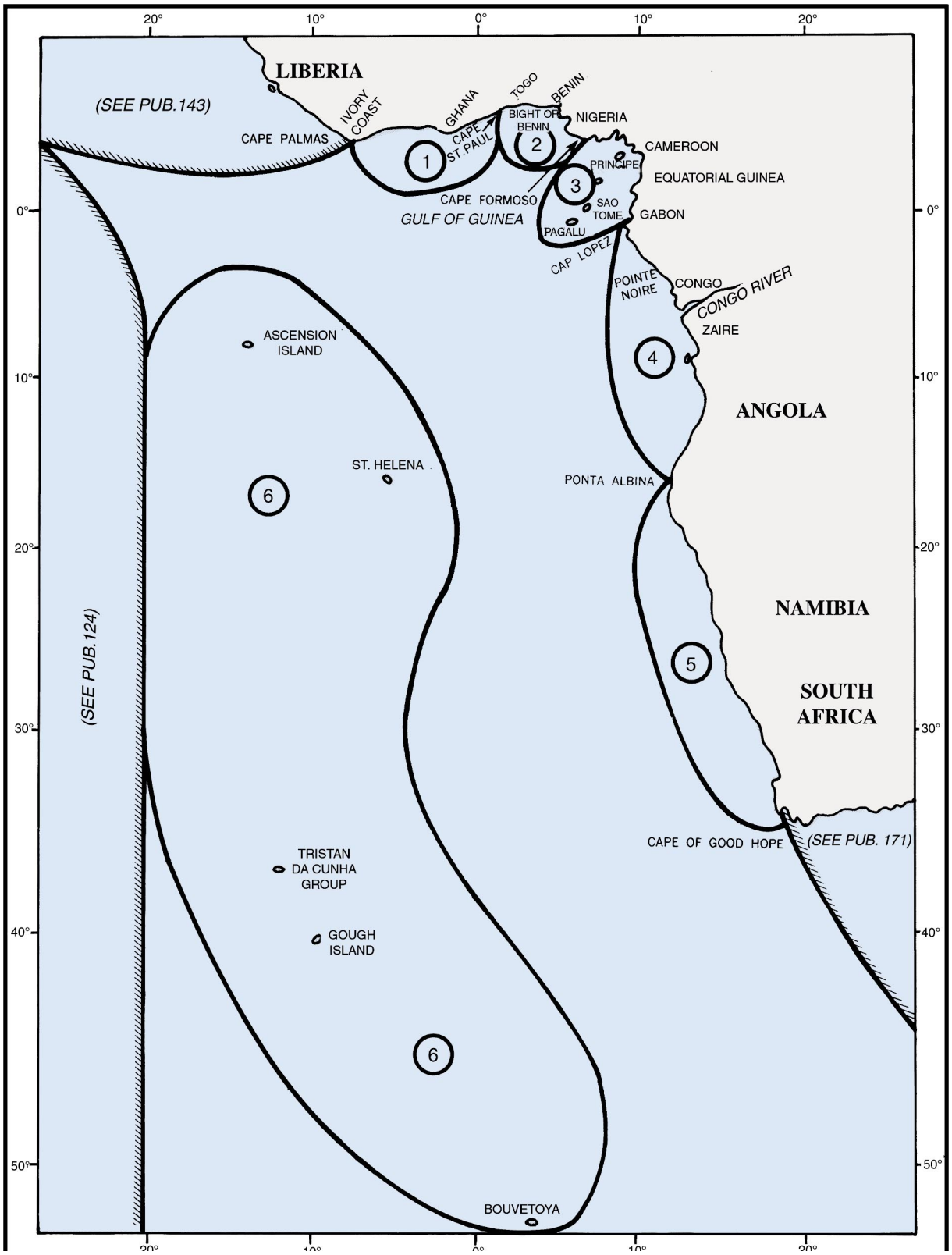


SECTOR LIMITS — PUB. **123**

Feet to Meters

Feet	0	1	2	3	4	5	6	7	8	9
0	0.00	0.30	0.61	0.91	1.22	1.52	1.83	2.13	2.44	2.74
10	3.05	3.35	3.66	3.96	4.27	4.57	4.88	5.18	5.49	5.79
20	6.10	6.40	6.71	7.01	7.32	7.62	7.92	8.23	8.53	8.84
30	9.14	9.45	9.75	10.06	10.36	10.67	10.97	11.28	11.58	11.89
40	12.19	12.50	12.80	13.11	13.41	13.72	14.02	14.33	14.63	14.93
50	15.24	15.54	15.85	16.15	16.46	16.76	17.07	17.37	17.68	17.98
60	18.29	18.59	18.90	19.20	19.51	19.81	20.12	20.42	20.73	21.03
70	21.34	21.64	21.95	22.25	22.55	22.86	23.16	23.47	23.77	24.08
80	24.38	24.69	24.99	25.30	25.60	25.91	26.21	26.52	26.82	27.13
90	27.43	27.74	28.04	28.35	28.65	28.96	29.26	29.57	29.87	30.17

Fathoms to Meters

Fathoms	0	1	2	3	4	5	6	7	8	9
0	0.00	1.83	3.66	5.49	7.32	9.14	10.97	12.80	14.63	16.46
10	18.29	20.12	21.95	23.77	25.60	27.43	29.26	31.09	32.92	34.75
20	36.58	38.40	40.23	42.06	43.89	45.72	47.55	49.38	51.21	53.03
30	54.86	56.69	58.52	60.35	62.18	64.01	65.84	67.67	69.49	71.32
40	73.15	74.98	76.81	78.64	80.47	82.30	84.12	85.95	87.78	89.61
50	91.44	93.27	95.10	96.93	98.75	100.58	102.41	104.24	106.07	107.90
60	109.73	111.56	113.39	115.21	117.04	118.87	120.70	122.53	124.36	126.19
70	128.02	129.85	131.67	133.50	135.33	137.16	138.99	140.82	142.65	144.47
80	146.30	148.13	149.96	151.79	153.62	155.45	157.28	159.11	160.93	162.76
90	164.59	166.42	168.25	170.08	171.91	173.74	175.56	177.39	179.22	181.05

Meters to Feet

Meters	0	1	2	3	4	5	6	7	8	9
0	0.00	3.28	6.56	9.84	13.12	16.40	19.68	22.97	26.25	29.53
10	32.81	36.09	39.37	42.65	45.93	49.21	52.49	55.77	59.06	62.34
20	65.62	68.90	72.18	75.46	78.74	82.02	85.30	88.58	91.86	95.14
30	98.42	101.71	104.99	108.27	111.55	114.83	118.11	121.39	124.67	127.95
40	131.23	134.51	137.80	141.08	144.36	147.64	150.92	154.20	157.48	160.76
50	164.04	167.32	170.60	173.88	177.16	180.45	183.73	187.01	190.29	193.57
60	196.85	200.13	203.41	206.69	209.97	213.25	216.54	219.82	223.10	226.38
70	229.66	232.94	236.22	239.50	242.78	246.06	249.34	252.62	255.90	259.19
80	262.47	265.75	269.03	272.31	275.59	278.87	282.15	285.43	288.71	291.99
90	295.28	298.56	301.84	305.12	308.40	311.68	314.96	318.24	321.52	324.80

Meters to Fathoms

Meters	0	1	2	3	4	5	6	7	8	9
0	0.00	0.55	1.09	1.64	2.19	2.73	3.28	3.83	4.37	4.92
10	5.47	6.01	6.56	7.11	7.66	8.20	8.75	9.30	9.84	10.39
20	10.94	11.48	12.03	12.58	13.12	13.67	14.22	14.76	15.31	15.86
30	16.40	16.95	17.50	18.04	18.59	19.14	19.68	20.23	20.78	21.33
40	21.87	22.42	22.97	23.51	24.06	24.61	25.15	25.70	26.25	26.79
50	27.34	27.89	28.43	28.98	29.53	30.07	30.62	31.17	31.71	32.26
60	32.81	33.36	33.90	34.45	35.00	35.54	36.09	36.64	37.18	37.73
70	38.28	38.82	39.37	39.92	40.46	41.01	41.56	42.10	42.65	43.20
80	43.74	44.29	44.84	45.38	45.93	46.48	47.03	47.57	48.12	48.67
90	49.21	49.76	50.31	50.85	51.40	51.95	52.49	53.04	53.59	54.13

The following abbreviations may be used in the text:

Units

˚C	degree(s) Centigrade	km	kilometer(s)
cm	centimeter(s)	m	meter(s)
cu.m.	cubic meter(s)	mb	millibars
dwt	deadweight tons	MHz	megahertz
FEU	forty-foot equivalent units	mm	millimeter(s)
grt	gross registered tons	nrt	net registered tons
kHz	kilohertz	TEU	twenty-foot equivalent units

Directions

N	north	S	south
NNE	northnortheast	SSW	southsouthwest
NE	northeast	SW	southwest
ENE	eastnortheast	WSW	westsouthwest
E	east	W	west
ESE	eastsoutheast	WNW	westnorthwest
SE	southeast	NW	northwest
SSE	southsoutheast	NNW	northnorthwest

Vessel types

LASH	Lighter Aboard Ship	ro-ro	Roll-on Roll-off
LNG	Liquified Natural Gas	ULCC	Ultra Large Crude Carrier
LPG	Liquified Petroleum Gas	VLCC	Very Large Crude Carrier
OBO	Ore/Bulk/Oil		

Time

ETA	estimated time of arrival	GMT	Greenwich Mean Time
ETD	estimated time of departure	UTC	Coordinated Universal Time

Water level

MSL	mean sea level	LWS	low water springs
HW	high water	MHWN	mean high water neaps
LW	low water	MHWS	mean high water springs
MHW	mean high water	MLWN	mean low water neaps
MLW	mean low water	MLWS	mean low water springs
HWN	high water neaps	HAT	highest astronomical tide
HWS	high water springs	LAT	lowest astronomical tide
LWN	low water neaps		

Communications

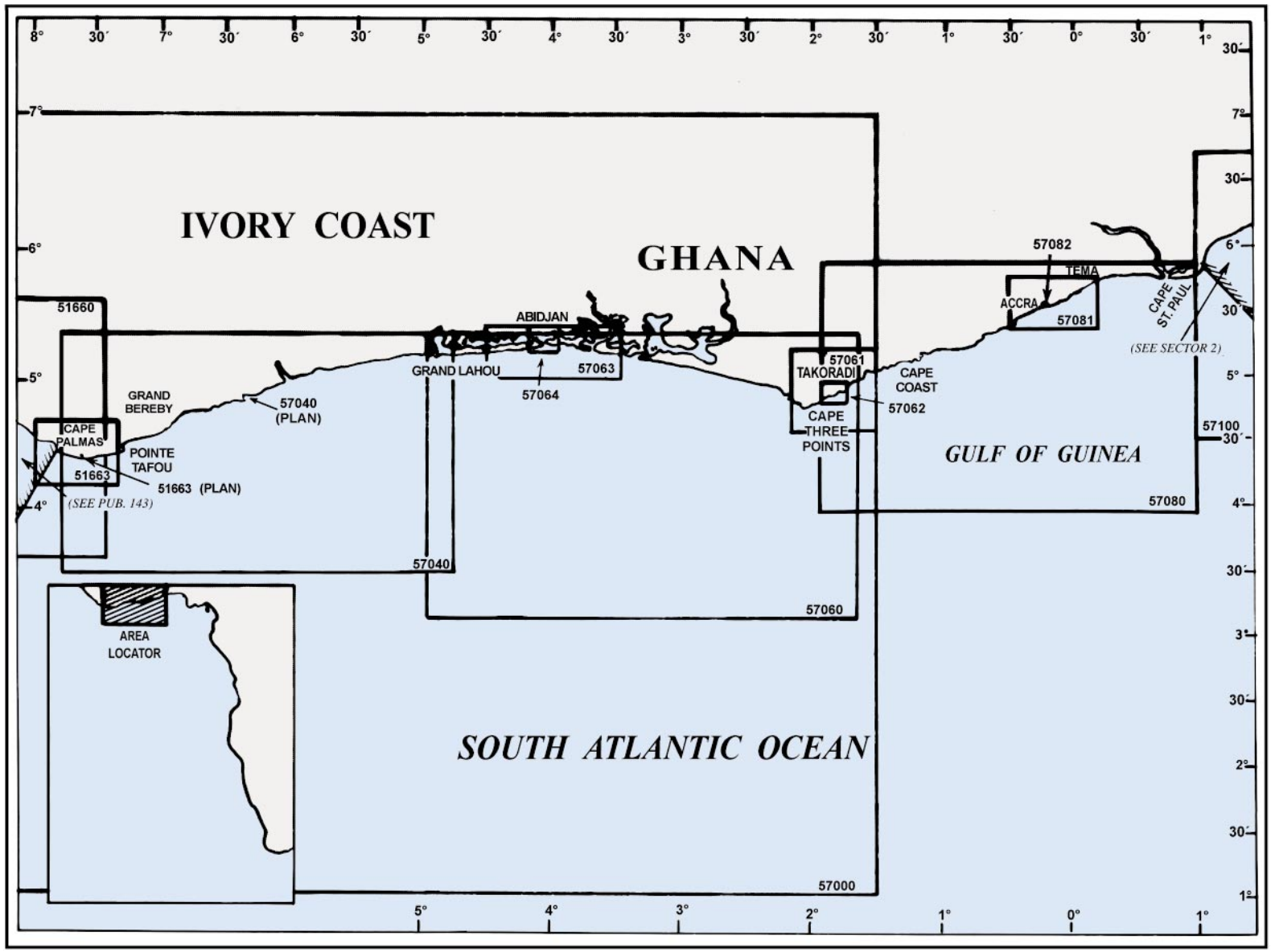
D/F	direction finder	MF	medium frequency
R/T	radiotelephone	HF	high frequency
GMDSS	Global Maritime Distress and Safety System	VHF	very high frequency
LF	low frequency	UHF	ultra high frequency

Navigation

LANBY	Large Automatic Navigation Buoy	SPM	Single Point Mooring
NAVSAT	Navigation Satellite	TSS	Traffic Separation Scheme
ODAS	Ocean Data Acquisition System	VTC	Vessel Traffic Center
SBM	Single Buoy Mooring	VTS	Vessel Traffic Service

Miscellaneous

COLREGS	Collision Regulations		
IALA	International Association of Lighthouse Authorities	No./Nos.	Number/Numbers
		PA	Position approximate
IHO	International Hydrographic Office	PD	Position doubtful
IMO	International Maritime Organization	Pub.	Publication
loa	length overall	St./Ste.	Saint/Sainte



Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.

SECTOR **1** — CHART INFORMATION

SECTOR 1

IVORY COAST AND GHANA—CAPE PALMAS TO CAPE SAINT PAUL

Plan.—This sector describes the coasts of Ivory Coast and Ghana between Cape Palmas and Cape Saint Paul. The descriptive sequence is from W to E.

General Remarks

1.1 The coast described in this sector is bordered by reefs and relatively elevated as far as the W approaches to Cape Three Points, a distance of about 230 miles. It is fronted by a low, sloping, and sandy beach backed by tall vegetation. The W part of the coast, between Cape Palmas and Cape Three Points, is high, rocky, and rises gradually to the interior. The E part of this coast is low, sandy, and backed by a number of lagoons. Several rivers discharge through this stretch of the coast, but are of little navigational value. The shoreline, which is subject to a dangerous surf, consists mostly of a sandy beach backed by tall brushwood.

Winds—Weather.—The SE trade wind system is the basic and most extensive wind regime in the area. Between 5˚S and 30˚S, winds blow from the SE quadrant just about all year round. These trade winds are most strongly developed between 10˚S and 25˚S, where their frequency approaches 85 per cent. The average strength of these winds ranges from force 3 to 4 in the waters of the N part to force 4 to 5 in the waters lying between 20˚S and 30˚S.

Within 100 miles of the coast, between **Mayumba** (3˚24'S., 10˚39'E.) and Cape Town, the SE trades are deflected and blow parallel to the coast, which results in a predominance of S winds. To the N of 20˚N and to the W of 10˚W, in accordance with the counterclockwise flow around the South Atlantic Anticyclone, the winds take on a more E component.

The Doldrums, which is associated with the equatorial trough, is a band of light and variable winds. For most of the year, this band is located in the N part of the area, but from late February through March, it reaches the portion of the area lying N of the Equator. During these months, winds to the N of the Equator are calm for about 40 per cent of the time.

The most significant of the local wind regimes in the area is the Southwest Monsoon. This large scale sea breeze occurs in the N sections over the Gulf of Guinea and extends 100 to 200 miles inland. It is strongest from June through August, but is prevalent all year round. The monsoon is a deflection of the SE trade winds toward the heated continental interior. Its influence is felt up to 10˚S and it acts very much like a land-sea breeze regime. At **Douala** (4˚03'N., 9˚41'E.), for example, while SW winds are prevalent during the afternoon, their frequency drops to 5 per cent in the early morning hours.

The harmattan, a wind of continental origin, is hot, dry, and blows from the NE quadrant. It reaches the shores of the Gulf of Guinea and extends seaward. This wind is prevalent from December through early March and is usually laden with fine dust, which can seriously impair visibility in the form of haze. The harmattan is found mainly between Cape Palmas and Douala.

A local wind occurring to the N of the Congo River is known as a tornado. This should not be confused with the phenomenon, known by the same name, which occurs in the United States. African tornados are violent wind squalls which often accompany thunderstorms. They are most frequent from January to early May and from September to November. Tornados can originate either on the land and move seaward or over the water and move onshore.

The barometer gives no warning, but a dark bank of cumulonimbus clouds, with tops reaching 6,000m or more, usually indicates the approach of a tornado. At the base of the cloud bank, there is generally a roll of low clouds and the atmosphere becomes still and oppressive as it approaches. A sudden wind squall, with gusts of 50 knots or more, occurs as the roll of low clouds passes overhead. Then, a few minutes later, rain begins and is accompanied by thunder and lightning. The rain is often very heavy and may reduce visibility to practically zero. The wind usually lasts for less than one hour, but the rain may continue longer. These tornados may be local or they may have the characteristics of a squall line, 100 miles or more wide. Occasionally, these tornados occur without any rain and are known appropriately as dry tornados.

Gales are infrequent over most of the area. Along the coast and to the N of the Equator, they occur on 1 to 6 days annually. From the Equator to Walvis Bay, gales occur on less than 1 day per year. At Walvis Bay, gales can be expected on 14 days annually; 7 of these days occur in October while 4 of these days occur in July and August.

To the S and into the subtropics, gale frequencies increase. At Cape Town, gales occur on an annual average of 22 days, with most from December through March. Over the ocean area, gales are infrequent to the N of 25˚S. They occur for an average of 3 per cent of the time from April through September between 25˚S and 30˚S. The frequency of the gales increases rapidly to the S of 30˚S and from May through September they occur for 10 to 20 per cent of the time between 30˚S and 35˚S. During this same period, gales occur for 12 to 25 per cent of the time between 35˚S and 40˚S. To the S of 40˚S, data is too sparse for an accurate analysis.

All sea areas lying near the shores of the continents and larger islands are influenced by land and sea breezes. Modification of the prevailing winds by onshore winds during the afternoon and offshore winds during the early morning causes corresponding increases or decreases in sea heights. Gravity winds usually result when dense cold air, which accumulates on the continental highlands, flows rapidly down the slopes and out over the sea. They can produce high waves for a short distance from the shore.

Tides—Currents.—The Guinea Current is felt in the vicinity of Cape Palmas and as far E as Pointe Tafou. It disappears about 100 miles ENE of this latter point and then resumes weakly to the E of Abidjan. The currents generally begin about 80 miles E of Abidjan and set inshore between this location and Cape Three Points.

The currents in the vicinity of Cape Three Points are variable in both strength and direction. A current setting E, with a rate as high as 3 knots, has been reported.

Vessels heading W from Cape Saint Paul to Cape Three Points are advised to stay as close to the coast as safety permits. Such vessels usually encounter only a weak current with a rate of 0.4 knot. However, vessels taking the direct route generally encounter a current which ,at times, attains a rate of 3 knots.

Depths—Limitations.—Depths in the approaches to this coast are deep and clear of dangers. The 200m curve lies generally parallel to the coast and between 13 and 23 miles offshore. The only exception is Le Trou Sans Fond, in the approaches to Abidjan, where the 30m curve lies almost parallel to the coast and between 1 mile and 6 miles offshore. There are no known dangers outside of the 200m curve.

Caution.—Vessels should not approach within 2.5 miles of the coast between Cape Palmas and the Cavalla River (4˚22'N., 7˚32'W.). The depths lying off the coast are very irregular, particularly in the vicinity of Growa Point (4˚21'N., 7˚37'W.) and Cavalla Point (4˚21'N., 7˚36'W.).

Cape Palmas to Abidjan

1.2 **Cape Palmas** (4˚22'N., 7˚44'W.), 19m high, is a rocky peninsula which is connected to the mainland by a low and sandy isthmus. Between this cape and Growa Point, 6.7 miles E, the coast consists of a high, sandy beach. A conspicuous black rock lies about 2.5 miles E of the cape.

A shallow lagoon lies close behind the sandy foreshore and extends parallel to it for about 3.5 miles. The village of Buddu is situated near the E end of this lagoon. During the rainy season, the lagoon breaks through to the sea and flows out between the groups of houses standing in the village.

Newill Rock, with a least depth of 6m, lies about 1.7 miles ESE of Cape Palmas. Athol Rock, with a least depth of 6.4m, lies about 3 miles WSW of Growa Point. Two rocky heads, with depths of 6.4 and 9.1m, lie about midway between Newill Rock and Athol Rock. A shoal patch, with a depth of 16.5m, was reported (1967) to lie about 4.5 miles SSE of Cape Palmas.

Growa Point (4˚21'N., 7˚37'W.) is a long, low, and rocky projection. Growa Reefs, on which the sea breaks heavily, extends up to about 0.8 mile SW and 0.4 mile S from this point. During good weather, landing is possible in the vicinity of the point, but a surf boat is necessary.

Helene Woerman Rock, with a least depth of 3.7m, lies about 2.5 miles SW of Growa Point. This steep-to rock, which was reported not to break in the dry season (November to March), is the outermost danger along this part of the coast.

A shoal patch, with a depth of 10m, lies about 1.7 miles SSW of Growa Point and another patch, with a least depth of 9m, lies between it and Growa Reefs. Harvey Rock, on which the sea always breaks, lies about 1.2 miles WSW of Growa Point. Several rocky patches, with depths of 5 to 10m, lie within 0.5 mile of Harvey Rock. A patch, with a least depth of 9.1m, lies about 1 mile SSW of Cavalla Point.

Foul ground, with several above-water rocks, extends up to 0.8 mile from the coast between Growa Point and Cavalla Point. Cavalla Ledge, formed by a group of shoals, lies about 1 mile offshore, 2.8 miles ESE of Cavalla Point. The shallowest shoal, with a depth of less than 1.8m, breaks and lies at the NW end of the group.

1.3 The **Cavally River** (4˚22'N., 7˚32'W.) indents the coast 4 miles E of Cavalla Point. It is navigable up to about 40 miles above the mouth by small power vessels. This river forms the boundary between Liberia and the Ivory Coast.

Two umbrella trees stand close together on the W side of the entrance and a small house, with a tiled roof, is situated close W of them. The entrance channel, which is about 90m wide between the sand banks, is constantly changing. Sunken rocks lie close offshore at the W side of this channel and the bar, which fronts the entrance, has the reputation of being the most dangerous along this part of the coast. The village of Blieron is situated on the E side of the entrance. A prominent white building, with a red roof and a flagstaff, is situated in the village. Anchorage may be obtained, in depths of 12 to 15m, sand and mud, about 1 mile S of this building.

Between the Cavally River and Pointe Tafou, 10.5 miles ENE, the coast is low, sandy, and backed by a dense forest. It is broken occasionally by clumps of trees up to 60m high. A prominent flat-topped hill rises 3 miles N of the entrance to the river. It has a conspicuous knob, 94m high, standing close W of the center. In clear weather, this knob is visible from up to 18 miles to seaward.

A rounded, sandy point is located 2.7 miles E of the mouth of the Cavally River and is fronted by extensive reefs, which extend up to about 0.8 mile seaward. Several rocks, up to 3.7m high, lie in the vicinity of these reefs. A stranded wreck, which was reported (1987) to be radar conspicuous, lies in the vicinity of these rocks.

Subra Meno Point (4˚22'N., 7˚27'W.) is located 4.5 miles ENE of the mouth of the Cavally River and a stranded wreck lies 0.4 mile S of it. A 9.1m patch has been reported to lie 2.7 miles SE of the point. Rocks, which break, lie 0.7 mile offshore, 2.5 miles E of the point.

Pointe Tafou (4˚25'N., 7˚22'W.), marked by a light, is a low and rocky point at the W entrance of the Tafou River. This river is small and used only by canoes. It was reported (1969) that the entrance had silted up and only the beach was in use.

1.4 **Pointe Basha** (4˚28'N., 7˚15'W.) is located 7.5 miles NE of Pointe Tafou. The coast between consists of a sandy beach backed by densely-wooded country. Pointe Basha, which shelters a loading anchorage, is surmounted by a rock which resembles the outline of a fort from the W. A buoy is moored 1.6 miles ENE of this point.

Grand Basha, a village, stands on the N side of the entrance to a river, 1 mile N of the point. It may be identified by a prominent long and low house with a gray roof. Pointe Boubele, the S entrance point of the river, is marked by two beacons. A post, with a triangular daymark, stands 0.9 mile NNE of Pointe Boubele, but it is situated near the shore and not easily distinguished. A wharf, which is used by lighters, fronts the shore close N of Pointe Boubele. Anchorage may be obtained, with good holding ground, in depths of 12 to 16m, sand and broken shells with gravel, about 1 mile E of Pointe Boubele.

The coast continues ENE for 13 miles from Pointe Basha to Pointe Poor. A long and narrow lagoon lies close behind the beach, which fronts the coast for the last 8.2 miles. The sandy

beach barrier that separates this lagoon from the sea is covered with trees, but occasional bare spots show where the waters burst through in the rainy season.

Pointe Poor (4˚32'N., 7˚03'W.) is low, rocky, and fringed by rocks which extend up to about 0.3 mile seaward.

1.5 **Poste de Bereby** (Point Sagree) (4˚34'N., 7˚01'W.), located 2 miles NE of Pointe Poor, is one of the few places along this part of the coast where landing is possible. Moderately-high mountains rise 8 and 12 miles NNW of this point and provide good landmarks. Anchorage can be taken, in a depth of 20m, sand, about 0.5 mile SE of the point.

Pointe Kadabou (4˚39'N., 6˚54'W.) is located 8.5 miles NE of Poste de Bereby. The coast between consists of a succession of sandy bights divided by rocky points.

From about 1 mile NE of Poste de Bereby, an extensive chain of reefs lies parallel to the coast and extends for about 4.5 miles. Ilot Devil, with a black base, lies 2.3 miles SW of Pointe Kadabou. This islet is 13m high and has a flat summit which has been whitened by numerous sea birds settling on it. A shoal, which breaks, lies 0.3 mile NNE of the islet.

Pointe Kadabou consists of a bold and rocky cliff, 36m high, which can easily be recognized by a white rock standing near its summit. The village of Basa (Grande Berebi) is situated on this point and several reddish houses, with a group of palm trees, are prominent from seaward. A roadstead, used mostly for loading timber, lies at the head of the bight entered N of Pointe Kadabou. A river, with a lagoon at its entrance, empties into the head of this bight. Anchorage may be obtained, in a depth of 11m, about 0.5 mile E of Pointe Kadabou, or, in a depth of 14m, about 1 mile ESE of the same point.

1.6 **Roche Katoum** (4˚40'N., 6˚53'W.), lying about 1 mile NE of Pointe Kadabou, appears white on its upper part, but becomes brown during the rainy season. Shoals extend up to about 200m seaward from the W and NE sides of this rock.

Pointe Tahu (4˚42'N., 6˚42'W.) is located 13.5 miles ENE of Basa (Grande Berebi). The coast between consists mostly of sandy beaches and is wooded with numerous villages. The shore is rocky and steep-to in places. Numerous rocks, both above and below-water, lie off this coast and it should be given a wide berth.

The coast from Pointe Tahu continues for 6 miles to the entrance of the San-Pedro River. It is generally sandy, wooded, and fringed by rocks.

Caution.—It was reported (1993) that a stranded wreck is near Basa (Grand Berebi) in approximate position 4˚39'N, 6˚55'W.

It was reported (1995) that the vessel had grounded in approximate position 4˚38'.5N, 6˚55'W, and that the owners intend to abandon the vessel as a constructive total loss.

1.7 **San-Pedro** (4˚44'N., 6˚37'W.) (World Port Index No. 45963), a partly-sheltered harbor used mostly for timber export, lies 1.5 miles SW of the mouth of the San-Pedro River.

Winds—Weather.—The harbor is exposed to E and NE winds and seas. At such times, a heavy swell may also be experienced at the quays.

Tides—Currents.—The tidal range in the harbor is about 1.5m. The tidal currents attain rates of 0.5 to 1 knot at the entrance, but are less inside the harbor. A strong undertow may be felt within the harbor between June and September.

Depths—Limitations.—The harbor is entered through a channel, 137m wide, which is dredged to a depth of 12m. There are three principal quays. The W quay has 586m of berthage, with a depth of 10.5m alongside. The E quay has 1,120m of berthage with depths of 8.5 to 10.5m alongside. Vessels of up to 25,000 dwt, 220m in length, and 9.8m draft can be accommodated.

The S quay, 154m long, has a dredged depth of 10.5m alongside. It can be used by vessels of up to 150m in length and 8.5m draft.

Several head and stern mooring buoys are situated in depths of 10 to 11m within the N part of the harbor. They form berths which may be used by vessels of 100 to 200m in length with drafts of 8.5 to 10.5m.

A cement berth, 200m long, lies on the NW side of the harbor and has a depth of 11m alongside. It can accommodate vessels of up to 195m in length and 10.5m draft.

A tanker berth lies on the W side of the E quay. It can accommodate vessels of up to 90m in length and 5.5m draft. A turning basin, 400m in diameter, lies in the center of the harbor and is dredged to a depth of 11m.

Aspect.—Two multi-storied buildings, the E of which is taller, stand on the coast, close WSW of the harbor entrance. A conspicuous radio tower is situated 0.6 mile WNW of the harbor entrance.

San-Pedro Light, shown from a metal framework tower, 27m high, surmounts the E end of the summit of a hill which rises 1 mile NE of the harbor entrance. A prominent building and a silo stand 0.9 mile and 1.3 miles WSW, respectively, of the light.

A lighted range, which may best be seen on the chart, indicates the entrance channel.

Pilotage.—Pilotage is compulsory and is available 24 hours. Pilots can be contacted by VHF and board about 1.5 miles S of Jetee Ouest. Vessels should send their ETA 24 hours in advance, with a confirmation sent 3 hours before arrival; if the vessel length is greater than 200m, the draft should be stated in the messages.

Generally, vessels may enter by day only, but can depart by day or at night.

Anchorage.—Vessels may anchor, while awaiting a pilot, in 18m, sand, good holding ground, 0.8 mile SSE of the head of the W breakwater. Anchorage is not recommended W of the meridian passing through the head of the W breakwater.

Caution.—It was reported (1996) that the dredged areas in the harbor are no longer maintained and depths are less than charted in many places.

1.8 Between San-Pedro and Sassandra, 34 miles ENE, the coast generally consists of cliffs backed by mountains, some peaks of which are conspicuous. Collines Temple, 158m high, rises 7 miles NE of San-Pedro and marks the W end of a coastal mountainous chain which extends ENE for 27 miles.

Pointe Monoho (Pointe Drewin) (4˚48'N., 6˚26'W.) is located 5 miles E of Collines Temple. This point is prominent, high, rocky, abrupt, and wooded. It is fringed by several rocks which extend up to about 150m NNE. Landing can be effected on the gently sloping beach which lies in the sheltered inlet,

close W of the point. Anchorage may be obtained, in a depth of 11m, 0.3 mile E of the point.

Pointe Enframa (4˚52'N., 6˚13'W.) is located 14 miles ENE of Pointe Monoho. The coast between is formed by a succession of small rocky points with sandy beaches extending between them. The shore is fringed, in places, by reefs. The villages of Basa and Lolieko are situated 6.2 miles and 7.5 miles NE, respectively, of the point.

1.9 **Sassandra** (4˚57'N., 6˚05'W.), a harbor, is dominated on the W side by an abrupt headland which is 67m high and covered with luxuriant vegetation. The town stands between this headland and the entrance of the River Sassandra, 0.8 mile NNE. The harbor was reported (1983) to be permanently closed.

A school stands near the coast, 0.7 mile SW of Sassandra. It is conspicuous, well-lighted, and reported to be visible from up to about 15 miles seaward. A conspicuous hospital, consisting of a large white building, stands on a rocky spur, 45m high, and overlooks the town.

A navigational light is shown from a tower, 10m high, standing on the headland which rises on the W side of the former harbor; however, it is reported that the lights of the town are usually seen before this aid.

The coast extending to the E of Sassandra is flat for 3.5 miles and then hilly for 2.5 miles. The hills attain heights of about 110m and are broken by ravines.

Pointe Brouko (Pointe Mortality) (4˚59'N., 5˚58'W.) is located 7 miles ENE of Sassandra;several villages are situated in this vicinity. The point is prominent, bold, and steep-to.

From about 7 miles ENE of Pointe Brouko, a series of red cliffs begin and extend for 18 miles to Fresco. A beach stretches to the E of Fresco and is bordered by a row of trees in the middle of which is a wood.

Between Fresco and Grand-Lahou, 34 miles E, the coast is low and thinly wooded. It is bordered by a sandy beach, on which the heavy surf frequently makes communication with the shore impossible.

1.10 **Grand-Lahou** (5˚09'N., 5˚00'W.) (World Port Index No. 45970) stands on the W side of the entrance to the Bandama River. This town can be identified by two prominent houses, one with a black and the other with a red roof, standing at the W end. The entrance to the river is very narrow and is fronted by a dangerous bar. The yellowish water from the river can be seen to the E of the mouth and up to nearly 2 miles offshore. A main light is shown from a tower, 17m high, standing in the town. A racon is situated at the light.

Anchorage may be taken, in a depth of 15m, sand and mud, about 0.5 mile SSE of the light. The holding ground is good, but vessels roll heavily at this anchorage.

Caution.—Lion Terminal (5˚02'N., 4˚48'W.), a Floating Oil Storage Offloading (FSO) tanker, is moored about 13.5 miles ESE of Grand-Lahou.

1.11 Between Grand-Lahou and Abidjan, 61 miles E, the coast is bordered by a sandy beach. Numerous villages are situated along the shore, but are difficult to identify. The only danger is a shoal patch, with a least depth of 5m, lying about 4 miles ESE of the light at Grand-Lahou.

Lagune Eerie lies behind the coast, about 13 miles E of Grand-Lahou. This lagoon extends in a W to E direction for about 65 miles and contains numerous islands.

Grande Jack (5˚11'N., 4˚28'W.) is situated 29 miles E of Grand-Lahou. This village can be identified by the mass of foliage in the background and a prominent house with a white roof standing close E of it.

Jacqueville (5˚12'N., 4˚23'W.) (World Port Index No. 45980), situated 37 miles E of Grand-Lahou, can be identified by a group of white houses, two water towers, and a church. The entire length of the village is fronted by palms. A hazardous wreck lies 5 miles E of Jacqueville.

1.12 **Espoir Terminal** (5˚03'N., 4˚27'W.) comprises a platform and a nearby floating production and storage unit (FPSO) linked to the coast by an oil pipeline and gas pipeline oriented on a bearing of 328˚.

Pilotage is compulsory. The pilot will advise the boarding position after VHF contact has been established with the terminal. The pilot can be contacted on VHF channel 14. The FPSO control room can be contacted on VHF channels 16 and 69.

Vessels should send their initial ETA to the CNR Offshore Representative on departure from the previous port (or immediately on departure if the port is less than 72 hours from the terminal), as well as 72 hours, 48 hours, and 24 hours prior to arrival.

The first message should contain the following:

1. Vessel name, call sign, and INMARSAT numbers.
2. Cargo requirements.
3. Maximum loading rate.
4. Arrival draft fore and aft.
5. Last port of call.
6. Confirmation of clean bill of health.
7. Any sickness onboard.
8. Distance (in meters) from the bow to the loading manifold.
9. Length overall.
10. A statement to the effect that vessel can perform closed loading.
11. Confirmation that vessel is equipped with a bow stopper able to receive 76mm chain.
12. Local agent's name and details.

The CNR Offshore Representative must be notified should the vessel's ETA change, as follows:

1. By 6 or more hours following the 72-hour and 48-hour notice.
2. By 1 hour or more following the 24-hour notice

Berthing is available 0600 to 1500. Vessels arriving after 1500 will be berthed the following day. Unberthing is available 24 hours.

A standby anchorage zone for tankers is centered at a distance of 4 miles to the ENE of the tanker. A restricted area, which may best be seen on the chart, lies centered 8 miles S of Grande Jack and surrounds an abandoned oil field. Due to the existence of underwater obstructions, anchoring and fishing are prohibited within this are

1.13 **Le Trou Sans Fond** (The Bottomless Pit) (5˚13'N., 3˚58'W.) is a funnel-shaped submarine canyon which pene-

trates the coastal bank in the approaches to Abidjan. At a distance of 9 miles offshore, this canyon has a width of about 4 miles and a depth of over 800m. It still has a depth of 200m about 1.3 miles offshore, while at the head, close to the edge of the beach, there is a depth of 40m.

Caution.—An oil and gas field lies centered 16 miles SE of Grand-Lahou. It is reported (1995) to consist of three platforms, a storage tanker, and an SBM. The platforms are supported by several high strength cables in a triangular formation that radiate out at 7.6m below the sea level and then connect to the seabed. Vessels are requested to give this field a wide berth.

Abidjan (5˚15'N., 4˚01'W.)

World Port Index No. 46000

1.14 Abidjan is the capital and principal port of the Ivory Coast. It provides a sheltered harbor and is also a major railroad terminal.

Winds—Weather.—The wind usually blows from the SW with frequent calms, especially during the dry seasons. A dry wind blows occasionally from ENE between December and February. Hurricanes are frequent, particularly in April, May, October, and November. The weather in this vicinity consists of four seasons, as follows:

1. A long dry season from December to April.
2. A long rainy season from May to the middle of July.
3. A short dry season from the middle of July to September or October.
4. A short rainy season from September or October to November,

A swell from the SW, which never quite subsides, generally attains a height of 0.3m and causes rollers along the beach in the vicinity of the port. This swell has been reported to occasionally attain a height of 1.8m during June, July, and August.

Tides—Currents.—The tides rise about 1.2m at springs and 0.9m at neaps.

At springs, the ebb tidal current attains a rate of about 6 knots at the seaward end of Canal de Vridi. The flood current is weaker and at neaps and during the rainy season, it is imperceptible.

At the entrance of Canal de Vridi, the tidal currents sometimes set toward the W bank with strong eddies. At such times, vessels should use care as they may encounter difficulties in maneuvering, particularly heavily loaded tankers.

Depths—Limitations.—The port is entered through Canal de Vridi which is about 1.5 miles long. This canal has a width of 370m, except at the seaward end where it is only about 200m wide. The canal has been dredged (1992) to a depth of 13.5m..

Vessels can transit through the canal when the tidal current is setting at a rate of less than 2 knots. At neaps, this occurs anytime. At springs, this occurs from 1 hour before to 1 hour after HW and from 1 hour before to 30 minutes after LW. Large vessels are advised to arrive at the entrance to the canal at HW.

Overhead power cables, with a minimum vertical clearance of 66m, span the canal, 0.6 mile NW of the S entrance.

A tanker berth, consisting of an L-shaped jetty, lies near the middle of the E bank of the canal. It is equipped with breasting dolphins and mooring buoys and has a depth of 10m alongside. Vessels of up to 210m in length and 9.1m draft can be accommodated.

A mineral pier, with a depth of 8m alongside, lies in the N part of the E bank of the canal. A private fertilizer pier, 90m long, lies close E of the mineral pier and can accommodate vessels of up to 130m in length and 7.9m draft.

South Quay, 0.8 mile long, extends N from a point located 0.5 mile NE of the N end of the canal. It provides ten berths and is reported (1989) to have depths up to 12.5m alongside. A ro-ro pier is situated S of South Quay. It is 200m long and has a depth of 12.5m alongside.

A fishing vessel basin is situated N of South Quay. It has 1,050m of berthage with depths of 5 to 7m alongside. West Quay, 0.8 mile long, extends NW from the fishing basin. It provides ten berths and has a depth of 10m alongside. North Quay, 0.4 mile long, extends NE from West Quay. It provides five berths and has a depth of 10m alongside.

Banana Wharf, 240m long, lies N of North Quay. It provides two berths and has a depth of 7m alongside.

There are facilities for general cargo, ro-ro, container, timber, fruit, bulk, tanker, and fishing vessels. Vessels of up to 260m in length and 11.3m draft can be accommodated, but the maximum draft for entry is sometimes reduced to 9m during periods of heavy swell.

It was reported (1995) that vessels of up to 220m in length could only enter with drafts up to 10.4m and vessels of up to 260m in length could only enter with drafts up to 9.1m.

Aspect.—Lighted ranges, which may best be seen on the chart, indicate the channel leading to the canal entrance. An outer lighted buoy, equipped with a racon, is moored about 0.9 mile SE of the S entrance of the canal.

Several oil tanks, flares, a refinery, and a signal station, all prominent, stand on the E side of the canal. A conspicuous crane stands on the W side of the entrance to the canal.

A main light is shown from a conspicuous tower, 27m high, standing 2.5 miles E of the S canal entrance.

The government palace, a large prominent building, stands on a small hill, in the SW part of the town. Two conspicuous power station chimneys stand on the E side of the canal, 0.7 mile NW of the signal station. Pylons, supporting the overhead power cable, stand close S of the power station and are also conspicuous.

Ile Boulet (5˚16'N., 4˚06'W.) forms the W side of the canal. It has a wall, painted white, bearing 313˚ ahead. It is used as a mark by vessels transiting the canal.

Pilotage.—Pilotage is compulsory for vessels of more than 150 grt and is available 24 hours. Pilots can be contacted by VHF and generally board about 0.8 mile SSW of Lighted Buoy AN.

Vessels send their ETA and draft 24 hours, 6 hours, and 1 hour in advance.

Regulations.—A Vessel Traffic Service (VTS) is in operation in the approach to Canal de Vridi. The VTS Control Zone is a circular area, with a radius of 1 mile, centered on Lighted Buoy R. The VTS center, call sign Vigie, can be contacted on VHF channels 12 and 16.

Anchorage.—Vessels awaiting the pilot should anchor W of the meridian passing through the S entrance point of Canal de

Vridi. Vessels should anchor, in depths of over 20m, sand with good holding ground, at least 1 to 2 miles off the coast.

Caution.—Several submarine cables, which may best be seen on the chart, lie across Canal de Vridi.

A dangerous wreck is reported to lie about 0.5 mile SSW of the S entrance to Canal de Vridi.

Large vessels must comply with certain conditions and entry to the port may be delayed by adverse conditions of swell, current, or tide. The local authorities should be contacted in advance for the latest information concerning any restrictions.

Abidjan to Takoradi

1.15 Port-Bouet Offshore Terminal (5˚14'N., 3˚58'W.) (World Port Index No. 45990) lies 2.7 miles E of the entrance to Canal de Vridi and serves the refinery at Abidjan. An outer lighted buoy is moored 1.6 miles SSW of Port Bouet.

Submarine pipelines extend 0.9 mile SSE and 2.1 miles SSW from the vicinity of Port-Bouet. A berth, consisting of several mooring buoys, lies at the seaward end of the W pipeline. It can handle tankers of up to 80,000 dwt, from 170 to 270m in length, and up to 14m draft. A berth, consisting of an SBM, is moored at the seaward end of the E pipeline. It can handle tankers of up to 250,000 dwt, 200m in length, and 21m draft.

The SSW swell in the vicinity of the berths usually attains a height of 1.5m, but can reach a height of 2.7m during July and August.

Pilotage.—Pilotage is compulsory. Pilots can be contacted by VHF and board about 2 miles SSW of the outer lighted buoy moored off Canal de Virdi.

Tugs are compulsory. Vessels must send their ETA through their agents 72 hours and 24 hours in advance. Vessels must also contact the Abidjan Port Master the day before arrival at the Vridi roadstead and at least 6 hours before arrival to confirm the ETA.

Caution.—A restricted area, which may best be seen on the chart, surrounds the offshore terminal. Vessels not proceeding to or from the terminal are prohibited from entering this area without prior permission.

Belier Oil Field (5˚05'N., 3˚50'W.), consisting of one production platform, lies centered 11 miles SSE of Port-Bouet. A submarine pipeline extends between this field and Port-Bouet.

1.16 Grand Bassam (5˚12'N., 3˚43'W.), situated 15 miles ESE of Port-Bouet, stands on the narrow and sandy neck which separates Lagune Ouladine from the sea. A ruined pier extends S from the town and the Komoe River (Flueve Comoe) flows into the sea 2 miles E of it. Three radio masts and a tower are situated 2.7 miles ENE and 0.8 mile E, respectively, of the pier. The yellowish waters of the river discolor the sea up to about 4 or 5 miles offshore.

Vessels anchoring at Grand Bassam usually moor, in depths of 11 to 18m, good holding ground, off the ruined pier. Local knowledge is advised.

Canal d'Assinie (Assinic River) (5˚07'N., 3˚17'W.) lies with its mouth about 27 miles E of Grand Bassam. The coast between is fringed by trees, 30 to 35m high, and numerous huts are situated along the beach. The bar, which fronts the river, is often impassable and can only be crossed by small craft. A village stands close W of the river entrance; the town of Assinie is situated 8 miles E of it.

1.17 The coast extends 42 miles E from the entrance to Canal d'Assinie and is formed by a sandy beach, with lagoons and swamps, backed by hills. The interior of the country consists of thick forest.

The boundary between the Ivory Coast and Ghana lies about 13 miles E of the entrance to Canal d'Assinie.

The **Ankobra River** (4˚54'N., 2˚16'W.) is fronted by a shallow bar and boats should not attempt to cross it without local knowledge. With a heavy swell, the sea breaks in depths of less than 5m in the vicinity of the river entrance. Several rocks, above and below-water, lie close outside the mouth of the river.

Axim Bay is entered close S of the entrance to the river. It lies between Akrumasi Point and Pepre Point, 2.5 miles SSE. The N shore of this bay is sandy and the E shore is rocky. The shores are backed by densely wooded land which rises to hills, 60 to 90m high. Round Hill, 77m high, rises 1.2 miles E of Akrumasi Point.

1.18 Axim (4˚52'N., 2˚15'W.) (World Port Index No. 46020), an anchorage port for timber, lies at the E side of the bay, 0.7 mile N of Pepre Point.

Bobowasi Island, which is marked by a light, lies 0.4 mile NNW of Pepre Point and is connected to the coast by a reef. Litton Rock, with a least depth of 6.4m, lies about 2.3 miles W of the S extremity of Bobowasi Island. It is surrounded by rocky patches, with depths of 7 to 9m, which extend up to 0.3 mile seaward. Watts Rock, with a least depth of 6.7m, lies 0.7 mile S of Pepre Point and is surrounded by foul ground. Heaven Rock, with a least depth of 2.1m, lies about 1 mile W of Bobowasi Island and is also surrounded by foul ground. Depths of less than 9m lie close W, N, and ESE of this rock. Benin Rock, with a least depth of 6.4m, lies 0.4 mile NW of Bobowasi Island.

Anchorage may be obtained, in a depth of 9m, good holding ground, 0.7 mile WNW of Bobowasi Island and midway between Heaven Rock and Benin Rock.

The coast between Axim and Cape Three Points, 12 miles SE, is indented by several bays.

Cape Three Points (4˚45'N., 2˚05'W.) is the name given to the middle one of three points which form a section of the coast, 3.5 miles long. The entire face of this section, from West Point to East Point, consists of a series of hills with abrupt sides and rocky points. A light is shown from a tower, 19m high, standing on the S extremity of the cape.

Cape Shoal, a group of dangerous rocks, lies 0.8 mile SSW of Cape Three Points and has a least depth of 4.6m. The sea does not always break on this group and even with heavy rollers, the rocks only break at considerable intervals of time. Vessels are advised to stay in depths of at least 35m in this vicinity.

1.19 Achowa Point (4˚46'N., 1˚58'W.) is located 6 miles ENE of Cape Three Points. The coast between is bold and rocky for nearly 1 mile. It then becomes an undulating plain fronted by a sandy beach. The depths offshore between these

points are very irregular and vessels should not approach the coast without local knowledge.

Achowa Point is composed of several rocky projections, with reefs extending a short distance from each of them. Several above-water rocks lie close off the W side of the point and may be seen distinctly from seaward. A rock, with a least depth of 5.5m, lies 0.4 mile SSW of the outermost above-water rock. A rock, with a least depth of 18m, lies about 2.5 miles S of the point.

Adoblo Rock (4˚50'N., 1˚53'W.) lies at the end of a sandy projection which extends about 6.5 miles NE of Achowa Point. It is large, black, and shaped like a haystack.

Between this rock and Takoradi, 9 miles ENE, the character of the coast changes and the shore is fronted by reefs, irregular depths, and rocky shoals. Vessels are advised to keep in depths of at least 20m because of the numerous dangers.

1.20 Takoradi (4˚53'N., 1˚44'W.) (World Port Index No. 46040), a sheltered harbor, lies in the SW part of Takoradi Bay, which is entered between Takoradi Point and Sekondi Point, 4 miles NE.

Winds—Weather.—Squalls occur from the middle of February to the beginning of June and from the middle of October to the middle of December. They approach from between NE and SE, but usually from the former direction. The rainy season is from July to September.

Tides—Currents.—The tidal currents set in and out of the harbor entrance and run parallel to Lee Breakwater. Their effect is slightly noticeable in the E part of the harbor, but elsewhere it is nearly imperceptible.

Outside the harbor, a current sets E along the N side of Lee Breakwater and across the entrance. Rollers, which generally break W of Takoradi Point, are comparatively slight within the bay.

Depths—Limitations.—The harbor entrance was reported (1995) to have a depth of 10.6m.

The port has 1,400m of principal quayage, which provides seven main berths. These berths are 157 to 225m long and have depths of 8.6 to 10m alongside. There are facilities for general cargo, ore, bulk, ro-ro, and tanker vessels. Vessels of up to 186m in length and 9.2m draft can be accommodated.

In addition, nine mooring buoy berths are situated in the S part of the harbor. These berths can be used by vessels of 103 to 182m in length and up to 9.8m draft.

Aspect.—Takoradi Reef extends 0.6 mile S and 1 mile E of Takoradi Point. The harbor is formed by two breakwaters. Main Breakwater extends E and NNE along the N side of the reef. Lee Breakwater extends E from a point lying 0.4 mile N of the root of Main Breakwater. These breakwaters form an entrance, about 200m wide, which faces N.

A conspicuous hotel, over 30m high, stands 0.3 mile WNW of Takoradi Point. A prominent clock tower and a water tower, marked by a light, stand close together, 0.3 mile W of the inner end of the harbor.

Several prominent oil tanks are situated near the root of Lee Breakwater Three radio masts stand 1.5 miles NNW of the root of Main Breakwater.

Pilotage.—Pilotage is compulsory and is available 24 hours. Vessels should confirm their ETA when within 30 miles of the port. Pilots can be contacted by VHF and board 0.7 mile NE of the head of Main Breakwater.

Vessels should send their ETA 24 hours and 6 hours in advance. Messages should contain the following information:

1. Vessel name.
2. Date of arrival.
3. Draft fore and aft.
4. Length overal.
5. Gross tonnage.
6. Net registered tonnage.
7. Time in port.
8. Last port of call.
9. Next port of call.
10. Nationality.
11. Port of registry.
12. Call sign.
13. Agent.
14. Duty officer.
15. IMO number.

Anchorage.—Anchorage can be taken, in a depth of 9m, good holding ground, to the N of Lee Breakwater. Designated anchorage berths may best be seen on the chart.

Caution.—A dangerous wreck lies about 0.2 mile E of the head of Main Breakwater.

Takoradi to Tema

1.21 Sekondi (4˚57'N., 1˚42'W.) (World Port Index No. 46045) lies about 4 miles NE of Takoradi. The coast between is composed of several bights divided by rocky points. The shore is fronted in many places by foul ground.

Poasi Bluffs is located 1.2 miles N of Lee Breakwater. A wreck, with a depth of 0.9m, lies about 2.3 miles E of Poasi Bluffs and is marked by a buoy.

Sekondi Point (4˚56'N., 1˚42'W.) is a bold, prominent, and rocky cliff, 29m high. It is surmounted by Fort Orange, a conspicuous square building, which is marked by a light.

The town of Sekondi extends W and N from the point and is situated between the fort and Sekondi Lagoon.

A naval harbor, which has depths of 4 to 11m, is formed by two breakwaters which extend seaward from the vicinity of the point.

Tsiakur Bansu Point (4˚57'N., 1˚42'W.), located 0.7 mile NNE of Fort Orange, is surmounted by a prominent pillar. A conspicuous green house, with a dark roof, is situated 0.3 mile SW of this point.

Sherbro Bank (4˚57'N., 1˚39'W.) has a least depth of 5.5m and breaks when the rollers are heavy. Vessels are advised to give this shoal bank a wide berth.

Roani Bank (4˚55'N., 1˚38'W.), with a least depth of 11m, lies about 5 miles ESE of Sekondi Point. It is reported that fishing craft are often encountered in the vicinity of this bank.

1.22 Aboadi Point (4˚58'N., 1˚38'W.) is located 4.5 miles ENE of Sekondi Point. The coast between consists of sandy beaches separated by abrupt rocky points. The shore is rather uniform in height and, although presenting a broken appearance, it is without any conspicuous features. Aboadi Point is a double point of low rock, with a conspicuous clump

of palm trees near its extremity. Several above-water rocks front the point and extend up to about 0.5 mile seaward.

Caution.—A tanker mooring buoy, connected to the shore by an oil pipeline, lies about 2 miles SE of Aboadi Point. The pilot, who comes from Takoradi, boards about 4 miles SW of the buoy.

1.23 Bassubu Rocks (4˚59'N., 1˚38'W.) lie 0.7 mile NE of Aboadi Point and are fringed by a reef which extends up to 0.5 mile E. The coast in this vicinity is fringed by reefs and foul ground which extend up to 0.8 mile offshore in places.

Shama Bay is entered between Aboadi Point and Kafodzidzi (Kotobrai), 6.5 miles NE. The bay affords considerable shelter from the swell, even during the rainy season. A conspicuous fort stands 2.3 miles NNE of Aboadi Point. It is situated on rising ground behind the town of Shama. The Pra River discharges into the bay between two lagoons, about 0.5 mile N of Shama. It is fronted by a shallow bar and only used by small craft. Anchorage may be obtained within the bay, in a depth of 12m, sand and mud, between 1.5 and 2 miles ESE of the town.

A straight beach, 4.5 miles long, extends from the mouth of the Pra River to Kafodzidzi, a point composed of prominent red cliffs. An irregular reef, lying 0.2 mile offshore, commences 1 mile W of the red cliffs and fronts their whole length.

Assay Point (5˚03'N., 1˚30'W.), located 3 miles ENE of Kafodzidzi, is surmounted by Gold Hill, an isolated hummock, which has a remarkable appearance when seen from the W. Foul ground and depths of 5 to 9m extend up to 1.2 miles SE of the point.

Between Assay Point and Komenda, 1 mile ENE, the coast is low and fronted by reefs. A lagoon lies close E of Komenda. Ampenyi (Ampeni), a small village, stands 3.5 miles ENE of Komenda and the town of Brenu-Achinum is situated on the summit of a small hill, close ENE of it.

Nkwanda (Ankwana) (5˚04'N., 1˚24'W.), a village, stands on the beach, 2.3 miles E of Brenu-Achinum.

Busum Accra Reefs fringe the coast in the vicinity of Nkwanda. These reefs appear in four distinct patches on which the rollers break heavily. Depths of less than 8m lie close to the outer edge of the reefs which extend up to about 0.5 mile offshore.

Elmina Point, the extremity of a low and rocky peninsula, is located 2.7 miles E of Nkwanda. The coast between is formed by a hard and sandy beach. Elmina Bay, about 0.5 mile wide, is entered close N of Elmina Point.

1.24 Elmina (5˚05'N., 1˚20'W.), a small town, extends around the shores of the bay. A fort, 30m high, stands on a hill and overlooks the S part of the town. Elmina Point is surmounted by a white fort and is fringed by a reef which extends up to about 200m seaward and dries 0.6m at its outer edge. Rollers break 0.2 mile off this reef, depending on the state of the sea and swell.

Anchorage may be obtained off the bay, in a depth of 13m, sand and mud, about 1.5 miles SE of the fort on Elmina Point. Anchorage may also be taken, in a depth of 9m, black mud, 0.9 mile E of the fort or in a depth of 5m, fine black sand with fair holding ground, 0.3 mile offshore.

1.25 Cape Coast (5˚06'N., 1˚14'W.) is situated 6.7 miles E of Elmina. The coast between is bordered by a sandy beach with regular soundings offshore, with the only exception being at the W end of the beach where there are two small rivers, each closed by a bar, which have a rocky stretch between them.

Cape Coast Castle, which is white and conspicuous, stands on a great mass of red sandstone lying on a projecting point. The town of Cape Coast stands behind this castle. A prominent mast is situated 1 mile N of the castle and is marked by obstruction lights at night.

During the dry season, vessels can anchor, in a depth of 9m, about 0.5 mile SE of the castle. During the rainy season, there is usually a long swell. Vessels should then anchor, in a depth of 18m, about 1.5 miles SE of the castle.

Between Cape Coast and Queen Ann's Point (Queen Anne Point), 2 miles NE, the coast consists of many small bays and points which are fronted by rocks. Generally, an almost continuous line of breakers appears along these rocks.

Queen Ann's Point is bold and steep. Its summit is surmounted by a village and the ruins of a fort. A small river, the mouth of which is closed by a bar, lies on the W side of the point. The adjacent land is hilly and covered with trees.

Between Queen Ann's Point and Moree Point, 1.3 miles NE, the shore is fronted by several rocks. The ruins of a fort, which are difficult to distinguish against the dark background, are situated on the heights above Moree Point. A black rock, with two heads on which the sea breaks, lies 0.2 mile E of Moree Point.

The coast between Moree Point and Kromantse, 8.3 miles NE, is foul; rocks extend up to 0.3 mile offshore in places.

1.26 Anashun Point (5˚09'N., 1˚10'W.), located 1.8 miles NE of Moree Point, is bold and consists partly of sand and partly of rock. Several prominent hills, covered with large trees, rise 5 miles NW of this point.

Biriwa Rock, over which the sea breaks, lies 0.7 mile ENE of Anashun Point. The village of Biriwa is situated on the coast, 0.3 mile NNW of this rock.

Anomabu Fort (5˚10'N., 1˚07'W.) is conspicuous and stands in front of the town of Anomabu, at the entrance to a cove. Anchorage may be obtained, in a depth of 16m, blue mud and sand, good holding ground, about 2 miles SE of the fort.

Kromantse (Kromanti) (5˚12'N., 1˚04'W.), a town, stands at the corner of a ridge of high ground on the E side of a river valley. It may be identified by several very tall trees. A conspicuous fort stands on a bold rocky base, 1 mile SW of the town. It is a square building, constructed of reddish earth, with a tower, 44m high, rising at the SW side.

1.27 Saltpond (5˚12'N., 1˚03'W.) (World Port Index No. 46063), a principal commercial center, stands 1.2 miles E of Kromantse. The town can be recognized by its numerous white houses, two churches, and a large red earth building standing on a height to the N.

Anchorage may be obtained, in a depth of 13m, hard sand, about 1.5 miles S of the town.

Caution.—An oil production platform, with a flare, is situated 7.5 miles SSE of Saltpond.

1.28 The character of the coast changes in the vicinity of Saltpond. It extends 14 miles E to the village of Aboana in an unbroken straight line of sandy beach. The shore, most of

which is cleared of trees and covered with long grass, is very low. Several villages, each standing near clumps of coconut trees, are situated along this stretch and two salt water lagoons lie behind the coast. The approach to this stretch of coast is clear, without any off-lying rocks, and the bottom is composed of fine sand and broken shells, with occasional mud.

Barbara Pow Hill, 97m high and peaked, stands 3 miles inland, 7.8 miles ENE of Saltpond.

Tantamkweri Point (Tantum Point) (5˚13'N., 0˚48'W.) is located 2.3 miles E of Aboana. The coast between is composed alternately of rock and sand. The village of Tantum, with the ruins of an old fort covered with jungle close NE, stands on the point.

Babli Point, located 1.2 miles NE of Tantamkweri Point, is formed by a large black rock fronted by foul ground.

Kwaben Hill (Obusumadi) (5˚17'N., 0˚47'W.), rising 3.5 miles N of Babli Point, is 143m high and table-topped. It forms an excellent landmark for this part of the coast.

Between Babli Point and Winneba Point, 12.5 miles NE, the coast is formed by several small and sandy bays which are separated by points fringed with some detached rocks.

Apam Point (5˚17'N., 0˚44'W.), located 5 miles NE of Babli Point, is fringed by above and below-water rocks. This point appears like a small hummock on the E side of a saddle-shaped hill which rises immediately from the sea. A ruined fort stands on the hummock.

Abrekum (5˚18'N., 0˚43'W.), a village, stands 1.5 miles NE of Apam Point. Assakri, consisting of two groups of above and below-water rocks, lies about 0.4 mile SSE of this village.

Ejisimanku Hill (5˚20'N., 0˚41'W.) is a bold and conspicuous headland with a steep ascent from the sea. Its summit, 180m high, is the E of two peaks. When viewed from the SE, it appears as a single conical hill with a flat top.

Muni Lagoon, lying 1 mile E of Ejisimanku Hill, is open to the sea only at the height of the rainy season. A heavily breaking reef, about 1 mile long, fringes the shore at the W side of the foot of Ejisimanku Hill.

1.29 Winneba (5˚20'N., 0˚37'W.), a town and resort, stands near the beach of a small inlet. It is situated within a hollow lying between two arms of slightly higher ground which extend to the sea. The higher ground, located on either side of the town, is about 30m high and mostly covered with trees of medium size. A white customs shed, situated on the beach, and a radio mast, standing 1.2 miles N of it, are conspicuous from seaward. Vessels can anchor, in a depth of 7m, sand, 0.8 mile SE of the customs shed.

Meredith Point (5˚23'N., 0˚30'W.) is located 7.8 miles ENE of Winneba. The coast between consists of a low and sandy beach. It then turns to the N and becomes rocky. The land rises close inland to several hills which are generally bare of trees, but covered with low and stunted bushes. The most prominent hill is 114m high and stands 2 miles WNW of the point. In addition, several conspicuous hills rise farther inland. Apra, with two hummocks, is 218m high and stands 10 miles N of Meredith Point. Camels Hump, about 360m high, stands 5.5 miles NNW of Apra. It is the central peak of a range which extends about 6 miles in a NE to SW direction.

Dampa Hill (5˚29'N., 0˚23'W.), 103m high, stands 9.3 miles NE of Meredith Point. It is conspicuous and forms the SW end of a range of hills which extend NE. Mount Bannerman, 148m high, rises 6.5 miles NE of Dampa Hill.

Caution.—It was reported (1994) that a wreck lies 2.3 miles offshore, about 11.5 miles NE of Meredith Point. The two masts of the sunken vessel are visible at HW; the wreck is marked by a buoy.

Oil exploration is being carried out along this coastal area and vessels are warned that numerous well heads, submerged pipelines, drilling rigs, and platforms may be encountered. Vessels should also exercise care when navigating in this vicinity, as many of the installations are often moved and are not charted.

1.30 Accra Point (5˚32'N., 0˚13'W.) is located 19 miles NE of Meredith Point. Shoals, with depths of less than 5m, extend up to about 0.5 mile E of this point. A main light is shown from a prominent tower, 28m high, standing on the point.

Accra (5˚32'N., 0˚12'W.), the capital of Ghana, extends NW and NE from Accra Point, but has no docking facilities and little protection from heavy seas. Several prominent tall buildings and churches stand in the city.

An open roadstead lies S of the city, but is encumbered by numerous foul areas, obstructions, and wrecks. Since the opening of the port of Tema, this roadstead is reported to be no longer used by cargo vessels.

Caution.—Due to the existence of submarine cables and obstructions, several prohibited anchorage areas lie S of Accra and may best be seen on the chart.

1.31 Between Accra and Tema, 14 miles ENE, the coast is generally low and featureless. Inland, the country is grassy, partly open, and diversified with groves of trees, bushes, and scrub. A ridge, 24m high to the top of the trees, runs along the shore and is broken at intervals by lagoons and stretches of low-lying country. These lagoons, which are not open to the sea, flood large areas behind this ridge during the rainy season.

The Shai Hills rise to a height of 289m and stand 28 miles NE of Accra Point. This picturesque range is very broken and rugged in outline. It is conspicuous in clear weather from seaward.

Caution.—Between Accra and Tema, numerous fishing canoes may be encountered offshore within the 200m curve. They fish with drift nets, moored nets, and hand lines by day and at night.

A prohibited entry area extends 5 miles seaward from **Christiansborg Castle** (5 32.6'N., 0 11.6'W). A prohibited anchorage area extends 10 miles seaward from the same point. In an emergency, mariners forced to violate these prohibited areas are required to contact the naval base at Tema or the Tema port authorities.

1.32 Teshe (Teshi) (5˚34'N., 0˚06'W.), a small town, stands 7 miles ENE of Accra. It is situated on the top of a ridge and extends down to the sea, where there are rocky cliffs, about 10m high. A number of prominent white buildings stand on the outskirts close W of the town. A church, with a low white roof and belfry, stands at the W end of the town and is conspicuous from S and W. Landing is extremely difficult and dangerous. It is only practicable in surf boats within a small bay lying near the mouth of a lagoon, close NE of the town.

Between Teshe and Tema, 7 miles NE, the coast consists of a sandy beach. Nungwa Point (Nungua Point), located 2 miles ENE of Teshe, is the SW of two points, 0.7 mile apart, and is fringed with rocky ledges. A shallow bay, in which canoes may be landed, lies between these two points. The village of Nungwa (Nungua), almost hidden by trees, stands on rising ground, 0.3 mile inland.

Greenwich Rock (5˚37'N., 0˚01'W.), 2.1m high, lies about 0.2 mile offshore, 3.5 miles NE of Nungwa Point. It can be easily recognized against the white background of the beach. Several other rocky ledges, over which the sea breaks heavily, extend up to about 0.2 mile seaward in this vicinity

Tema (5˚37'N., 0˚01'E.)

World Port Index No. 46070

1.33 The port of Tema provides extensive cargo facilities and is a major fishing center. The town stands on a ridge close N of the main harbor, which is formed by two rubble breakwaters.

Winds—Weather.—Winds from the W and SW prevail throughout the year, except between December and February, when the harmattan prevails from the NE. Dangerous squalls from the E occur mostly between May and July. The dry season lasts from December to February while the monsoon season continues from March to November.

Tides—Currents.—The tides rise about 1.5m at springs and 1.2m at neaps.

The Guinea Current, at a distance of about 3 miles SE of Tema, sets NE along the coast at a rate of about 0.5 knot.

Depths—Limitations.—The main harbor entrance is 240m wide. It was reported (1990) to have a depth of 10.6m.

An oil berth, with mooring buoys and dolphins, is situated near the head of Lee Breakwater. It can accommodate tankers of up to 198m in length and 9.7m draft.

A dredged fairway leads to Volta Wharf, a private aluminum berth, which lies on the inner side of Lee Breakwater, N of the oil berth. It can accommodate vessels of up to 182m in length and 9.7m draft.

No. 1 Quay, situated on the NW side of the harbor, has seven berths, each 183m long. No. 2 Quay, which extends NE from Main Breakwater, is 878m long and provides five berths. There are facilities for general cargo, container, bulk, and timber vessels. Vessels of up to 183m in length and 9.6m draft can be accommodated alongside. Vessels with drafts of over 9m can only enter at HW.

Two fishing basins, protected by breakwaters, lie at the E side of Lee Breakwater.

It was reported (1994) that vessels of up to 230m in length had been handled in the main harbor.

Aspect.—Main Breakwater extends ESE and then ENE to form the S side of the harbor. Lee Breakwater extends S from a point on the shore about 1 mile NE of the root of Main Breakwater. It forms the E side of the harbor and the W side of the fishing basin. These breakwaters are composed of rubble and are 4m high.

Chemu Point Light is shown from a tower standing 0.8 mile NE of the harbor. A conspicuous chimney, 152m high, is situated about 1 mile N of this light. A conspicuous hotel, marked by a light, and the port administration building, 35m high, stand 0.7 mile NNW and 0.5 mile N, respectively, of the root of Main Breakwater.

Pilotage.—Pilotage is compulsory and is available 24 hours. Pilots board 1 mile E of the mair breakwater.Vessels should send ETA 24 hours and 6 hours in advance. Messages should contain the following information:

1. Vessel name.
2. Date of arrival.
3. Draft fore and aft.
4. Length overall.
5. Gross tonnage.
6. Net registered tonnage.
7. Time in port.
8. Last port of call.
9. Next port of call.
10. Nationality.
11. Port of registry.
12. Call sign.
13. Agent.
14. Duty officer.
15. IMO number.

Vessels from Abidjan should also forward a 48-hour ETA message.

Anchorage.—Anchorage may be obtained off Tema, in depths of 10 to 18m, good holding ground. However, vessels should avoid anchoring on the rocky ridge, which has depths of 17 to 18m, lying 1.5 miles off Tema.

Caution.—An area, within which anchoring and fishing are prohibited, lies off the entrance to the harbor and may best be seen on the chart.

The latest information should be requested from the authorities in advance, as actual depths in the harbor may be less than charted due to siltation.

The harbor entrance is affected by swell and vessels may experience heavy rolling.

A dangerous wreck, with masts visible, lies about 1.8 miles ENE of the harbor and is marked by a buoy. It was reported (1992) that several uncharted and unmarked wrecks lie to the N of this wreck.

Tema to Cape Saint Paul

1.34 **Breaker Point** (5˚39'N., 0˚02'E.), located 0.7 mile NE of Tema, is fronted by a coastal bank, with depths of less than 5m, which extends up to 0.2 mile SE and 0.5 mile SW of it.

Grove Point (5˚40'N., 0˚03'E.) is located 1.5 miles NE of Breaker Point. The coast between consists of a sandy beach interspersed with rocky ledges. Numerous rocks, over which the sea breaks heavily, front this point.

Kpone Bay (5˚40'N., 0˚03'E.) is entered between Grove Point and Tenpobo Point, 5.5 miles NE. It has depths of 7 to 13m over a bottom formed by sand, shell, and coral. The village of Kpone, obscured by trees, stands on the top of a hill which rises close inland, 1.5 miles NNE of Grove Point. A white house, situated at the W side of the village, is conspicuous from the W.

Prampram (5˚43'N., 0˚06'E.), a town, stands 3.5 miles ENE of Kpone. The coast between consists of a beach fringed with palm trees. A lagoon lies in the flat country behind the beach.

The town is composed of an upper and a lower part. The upper part stands on the summit of a ridge, 50m high, but is partly obscured from seaward by trees. The lower part is not visible, but a white house is situated on the foreshore in front of it. Anchorage can be obtained, in a depth of 11m, about 1 mile S of this white house.

Vernon Bank (5˚42'N., 0˚11'E.), a narrow spit, has depths of 6 to 9m and extends about 12 miles ENE from the vicinity of Grove Point. The bottom of this bank is very irregular and is composed of rocky ledges and patches of sand, stones, and coral. There is a pronounced swell over the bank and it sometimes breaks in heavy weather.

Jange Lagoon (River Ningo) enters the sea through a narrow mouth lying between two sandy points, 4.5 miles NE of Prampram. It is reported to be always open and navigable by canoes whenever the heavy surf, which rolls in on the bar, allows.

Caution.—Numerous stranded wrecks lie along the shore between Tema and Prampram.

1.35 The coast extending for about 4 miles E of the mouth of Jange Lagoon is fringed by a broad ledge of rocks, over which a small river discharges. The edge of this ledge is nearly steep-to and heavy surf rolls over it incessantly.

Between the above ledge of rocks and the Volta River, 26 miles E, the shore consists of an uninterrupted beach. For 5 miles E of the ledge, the coast is formed by a low, clay cliff. Then, for the next 13 miles, it is formed by a sandy ridge, 4 to 5m high, which is covered by a few bushes. This ridge separates Songaw Lagoon, a large salt-water lagoon, from the sea. The lagoon is caused by the overflow from the Volta River. Its surface is broken by large tracts of swamps, some covered by grass and others by jungle, with a few high scattered trees.

1.36 Ada (5˚46'N., 0˚33'E.) is situated 2.5 miles W of the entrance to the Volta River. This town may be easily identified by a prominent mission house which stands near its W end. The house is long, white, and flat-roofed.

Anchorage may be obtained, in a depth of 13m, sand, about 1 mile SSE of the mission house. Vessels are advised not to anchor any closer to the shore as the depths decrease quickly and the swell is heavy at times.

The **Volta River** (5˚46'N., 0˚41'E.) empties into the sea between two low and sandy points about 0.5 mile apart. The trees in the vicinity of the entrance attain an unusual height. A dark grove stands on the E bank, 1 mile N of the entrance; from a distance it resembles a bluff headland. Another grove, resembling a conical hill, stands 2 miles E. Three groves of tall trees stand on the W side of the river entrance.

The river is subject to considerable differences in water level according to the season. It begins to rise early in June and commences to fall about the middle of October. The river is usually at its lowest in March and at its highest in September.

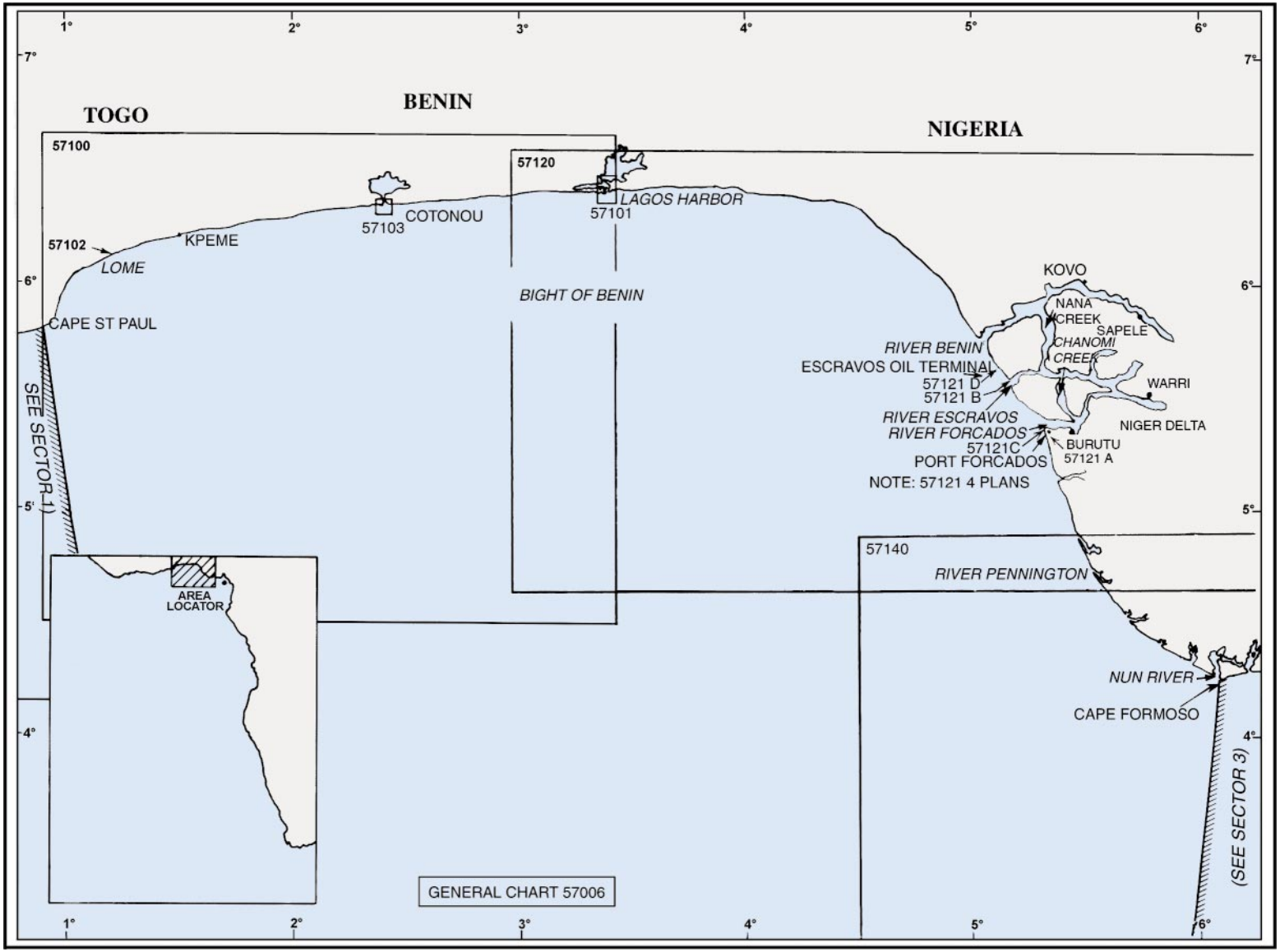
The bar, 0.2 mile wide, lies between the extremities of two lines of very heavy breakers which extend up to over 1 mile SE from the river entrance points. It has a least depth of 2.4m and should only be crossed in good weather.

Within the entrance, the river expands into a wide basin containing several islands, most of which are covered with thick bushes and trees. Local knowledge is necessary. Vessels with drafts up to 1.8m can ascend up to 45 miles from the mouth between July and November. During the remainder of the year, vessels with similar drafts would experience difficulty in proceeding only 40 miles above the entrance.

For about 7 miles E of the river entrance, the land is covered with dense forest, principally consisting of fan palms.

1.37 Cape Saint Paul (5˚50'N., 0˚58'E.) is located 18 miles ENE of the Volta River. The coast between is fronted by a beach.

Caution.—Depths in the approaches to the Volta River are liable to change. When passing the river entrance, vessels should keep in depths of 22m or more in order to avoid getting within the influence of the steep breakers and rollers. Vessels should also guard against the inward set of the flood tide.



Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.

SECTOR **2** — CHART INFORMATION

SECTOR 2

TOGO, BENIN, AND NIGERIA—CAPE SAINT PAUL TO CAPE FORMOSO

Plan.—This sector describes the African coast between Cape Saint Paul and Cape Formoso, 325 miles ESE. The descriptive sequence is from W to E.

General Remarks

2.1 The coast of the Bight of Benin, lying between Cape Saint Paul and Cape Formoso, forms a monotonous beach so uniformly low and flat that not a single inland landmark is visible from offshore. The elevation of the ground seldom exceeds 3m and even the most prominent clumps of trees do not rise to heights of more than 20m. This stretch of coast includes parts of Ghana, Togo, Benin (formerly Dahomey), and Nigeria.

The W shore of the bight is covered with jungle and groups of trees interspersed with numerous villages and detached huts. Near Keta, 5 miles N of Cape Saint Paul, the trees are high and form large and distinct groups. The trees then extend 45 miles ENE in a continuous line to Agoue, where they terminate except for a few dotted here and there. Throughout the long extent of coast forming the head of the bight, Lagos Harbor is the only permanent opening or outfall for the water in the lagoons. However, several partial breaks in the sand hills, through which the lagoons pour the overflow, form during the wet season (April to October). The SE shore of the bight has a distinctive character. It is no longer fringed by a bright sandy beach, but has a continuous dense mass of trees growing on a muddy foreshore. There are very few landmarks along this part of the shore, except for several rivers and creeks forming a delta.

Winds—Weather.—The land is frequently obscured by haze, locally known as "The Smokes," which in the dry season (November to May) prevails throughout the entire Bight of Benin. On the windward or W side of the bight, this haze is not so strong and the bright sandy beach, with its fringe of surf, can usually be distinguished. The haze generally lasts for about 3 hours, beginning after sunrise, and is then replaced by a sea breeze.

Tides—Currents.—The beach has a tidal range of about 1.5m, but the surf is so heavy and incessant along the shore and the swell is so constant that actual measurements in the W part of the bight are very difficult. Along the SE side of the bight and in the vicinity of the river bars, where the water is smooth, tidal measurements have been established by the authorities and are used by local boats.

The influence of the tidal currents generally extends up to between 4 and 9 miles off the mouths of the rivers. The ebb current is increased by the discharge of fresh water and attains a rate of about 3 knots at the river mouths. The rate of the flood current is generally much less than that of the ebb. At half ebb, a volume of turbid and brownish water is discharged from the rivers and usually carries floating uprooted trees, bushes, and clumps of leaves. This discharge discolors the sea with a brown scum for several miles. During the rainy season, the discoloration may extend up to 10 miles from the coast.

Regulations.—It is reported that all Nigerian ports are closed from 2000 to 0600. In addition, vessels are pro-hibited from transiting or anchoring in the approaches to the ports during this period unless they have been previously cleared for entry and are registered with the local authorities. Due to the complicated nature of the regulations, vessels are advised to communicate with their local agents well in advance in order to ensure compliance.

Two months prior to arrival in Nigerian waters, agents must register vessels with the Nigerian Ports Authority (NPA) in order to obtain a Ship Entry Notice (SEN). This does not apply to vessels carrying petroleum products in bulk or in ballast. Vessels cannot enter the territorial waters of Nigeria without a SEN.

For information concerning Nigerian VHF communications regulations and reporting requirements for Nigerian oil terminals, see Pub. 160, Sailing Directions (Planning Guide) South Atlantic Ocean and Indian Ocean.

Anchorage.—The bight affords excellent holding ground out to a depth of about 30m. The inshore bottom is composed throughout of stiff black mud and broken shells covered by sand. Outside the 30m curve, the bottom is generally composed of olive-colored mud, broken shells, and decayed vegetable matter. Anchoring anywhere within the bight must be prompted by necessity and not by comfort, as vessels lie more or less across the swell and usually experience unceasing heavy rolling, according to the strength of the current. In the W part of the bight, particularly toward Cape Saint Paul, the swell is not so heavy. Along the SE shore of the bight, vessels should anchor, in depths of 18 to 22m, about 9 miles offshore in order to avoid shoal water and because of the heavy ground swell that is perpetually rolling in.

Caution.—In the inland waters of Nigeria, rafts formed of timber and oil drums may be encountered. These rafts usually show a red light at each end at night.

Although the surf may occasionally appear practicable, landing should not be attempted anywhere between Cape Saint Paul and the end of the sandy beach located 60 miles E of Lagos, except in local canoes and surf boats.

Oil rigs and platforms have occasionally been encountered off the coast of Benin.

Vessels are cautioned that security off the West African coast and within some ports is a serious problem. In recent years (1986-2002), attacks by pirates and thieves have been reported. These have generally taken place at the outer anchorages, but some have occurred while berthed alongside.

Cape Saint Paul to Lome

2.2 Cape Saint Paul (5˚50'N., 0˚58'E.) is formed by a prominent and rounded section of the coast, but its exact position is difficult to define. The cape is usually considered to be located near the village of Woe. A light is shown from a pile

structure standing on this cape. A stranded wreck lies close to the shore 1.5 miles SW of the light.

The coast between Cape Saint Paul and the town of Keta, 6 miles N, is formed by a narrow ridge or barrier of sand which separates the sea from Keta Lagoon. The latter town, with a fort, is conspicuous from seaward. A large square bungalow, with a flagstaff at its W side, is situated close to the fort. Anchorage may be taken, in a depth of 9m, about 0.6 mile SE of the town. Rollers may come in heavily and without warning at this anchorage. Anchorage may also be taken, in a depth of 18m, about 1.8 miles SE of the fort. Vessels usually lie head to the swell at this anchorage because of the trend of the coast.

Between Keta and Lome, 18 miles NE, the coast is low and flat, with an occasional large clump of palms. It is fronted by a yellow, sandy beach on which the surf breaks heavily. Denu stands 15 miles NE of Keta. This village can be identified by a conspicuous house, situated near the beach, and some factories, standing about 0.5 mile NE of it. Afloao, another village, is situated 0.4 mile NE of Denu. A beacon is situated 0.3 mile E of this village and indicates the border between Ghana and Togo.

Lome (6˚08'N., 1˚17'E.)

World Port Index No. 46090

2.3 Lome lies 23 miles NE of Cape Saint Paul and is the only port of Togo. It is also a port of entry for Niger and Burkina Fasso. The harbor, which is formed by breakwaters, lies 5 miles E of the city.

Winds—Weather.—During January and February, calm N winds are to be expected, but at other times W to SW winds predominate. The rainy season is from April to July and the dry season is from February to March.

Tides—Currents.—The tide rises about 1.5m at springs and 1.2m at neaps.

Depths—Limitations.—The main breakwater, 0.5 mile long, extends ESE and protects the harbor from the S. The E breakwater, about 0.5 mile long, extends S. The harbor entrance is dredged to a depth of 14.5m.

There are two jetties within the harbor. They provide 1,100m of berthage, with dredged depths of 11 to 12m alongside.

A bulk berth is situated near the middle of the inner side of the E breakwater. It has a dredged depth of 12m alongside and can accommodate vessels of up to 210m in length and 11.5m draft.

A tanker berth is situated close to the head of the E breakwater. It has a depth of 12m alongside and can accommodate vessels of up to 250m in length.

Aspect.—A prominent four-storied hotel stands in the W part of the city and a conspicuous high-rise hotel is situated 0.5 mile NW of it.

Lome Light is shown from a structure surmounting a prominent gray water tower which stands 2.2 miles W of the root of the main breakwater. Baguida Light is shown from a pylon standing 2.4 miles NE of the head of the main breakwater.

The main breakwater is illuminated along its whole length by lights, situated 46m apart. Lighted buoys are moored 0.4 mile and 2.4 miles ESE of the head of the main breakwater.

A prominent radio mast stands 2.7 miles NW of the root of the main breakwater. Several prominent warehouses stand close NE of the root of the main breakwater.

Pilotage.—Pilotage is compulsory for all vessels over 300 grt and is available 24 hours. Vessels should send an arrival notification and a request for pilotage, via the agent, as soon as possible, stating vessel length, draft, quantity of cargo to be handled, and number of stevedore gangs required. Pilots board 0.7 mile ESE of the head of the main breakwater.

Anchorage.—Vessels waiting for a pilot should anchor, in depths of 15 to 17m, sand, between 0.5 and 1 mile S or SE of the main breakwater.

Caution.—An area, within which anchoring is prohibited, lies E of the harbor entrance and may best be seen on the chart.

Less water than charted was reported (1985) to lie near the head of the main breakwater.

Lome to Cotonou

2.4 Between Lome and Kpeme, 15 miles ENE, the coast consists of small, bushy sandhills with a few isolated palm trees. The shore is fronted by a sandy beach.

Kpeme (6˚12'N., 1˚31'E.) (World Port Index No. 46095) consists of a phosphate-loading facility and an offshore tanker berth.

Depths—Limitations.—A jetty, which is reported to be radar conspicuous, extends 0.6 mile S from the coast and has a depth of 13m alongside the head. Two islets, 76m apart, lie close SSW of the head of the jetty. These islets, along with four dolphins and several mooring buoys, form a loading berth. Vessels of up to 60,000 dwt, 225m in length, and 33m beam can be accommodated. A maximum draft of 9.5m is permitted for berthing while a maximum draft of 11.6m is permitted for departing.

A submarine pipeline extends 0.4 mile E from the head of the jetty to an offshore tanker berth. This berth consists of several mooring buoys and lies in a depth of 9.8m. Tankers of up to 40,000 dwt can be handled. It was reported (1987) that swell in the vicinity of the berth had reduced the maximum permitted draft to 8.2m.

Pilotage.—Pilotage is compulsory. Pilots can be contacted by VHF and board about 1 mile S of the head of the jetty. They remain on board throughout the loading procedure. Vessels should send an ETA 72 hours and 24 hours in advance.

Anchorage.—Vessels can anchor, in depths of 15 to 20m, mud and sand, good holding ground, between 1.5 and 2 miles SE of the head of the jetty.

Caution.—Severe coastal erosion occurs in the vicinity of Kpeme and nine groins have been constructed in order to control it.

2.5 **Anecho** (Aneho) (6˚14'N., 1˚35'E.) stands 5 miles ENE of Kpeme and is one of the largest towns along this part of the coast. It can easily be identified from offshore by the tower of a prominent yellow church and two large factories which are situated at its E side. The town stands on a strip of beach which is almost entirely free of trees, except at its W part. Vessels can anchor, in a depth of 15m, fine sand, about 1 mile S of the E end of the town. Local knowledge is advised.

A beacon is situated on the coast, 1 mile ENE of the town. It was reported (1995) that a prominent radio mast stands 1 mile NW of this beacon.

The border between Togo and Benin lies about 2 miles E of Anecho, in the vicinity of a narrow lagoon.

Caution.—Due to severe coastal erosion, a breakwater and five groins have been constructed in the vicinity of Anecho.

2.6 **Agoue** (6˚15'N., 1˚40'E.), consisting of numerous houses and several factories, is situated 5 miles E of Anecho. A prominent chapel and a large yellow church stand, respectively, near the W and E ends of this village.

Grand-Popo (6˚17'N., 1˚50'E.) stands 15 miles E of Anecho. The shore between is bushy with a few scattered palm trees. This town may be recognized by several prominent factories and a number of relatively high houses.

Bouche du Roi, lying 3.5 miles E of Grand-Popo, is the outlet of a lagoon which extends behind the coast. The water discharging from this outlet, which is subject to frequent change, discolors the sea for a considerable distance offshore, particularly during the rainy season (May to July).

Ouidah Plage (6˚19'N., 2˚06'E.), situated 16 miles E of Grand-Popo, is conspicuous from seaward. This village consists of two groups of buildings with white roofs. An isolated house, with a veranda and a prominent red roof, stands in the space between the two groups. From E, the prominent white clock tower of a church standing in the town of Ouidah, 3 miles inland, can be seen above the trees. Anchorage may be obtained, in a depth of 13m, brown sand, about 1 mile S of the highest storehouse in Ouidah Plage.

Avrekete-Plage is situated 7.5 miles E of Ouidah Plage. This village can be identified by a rather large, dark house and a white wall standing at its E end. The coastal bank, with depths of less than 12m, extends up to about 1 mile seaward in the vicinity of this village.

Godomey Plage is situated 14 miles E of Ouidah Plage. Two prominent radio masts and the conspicuous control tower of an airfield stand 4 miles ENE and 3 miles ENE, respectively, of this village.

Cotonou (6˚21'N., 2˚26'E.)

World Port Index No. 46110

2.7 Cotonou, a sheltered harbor, lies 6 miles E of Godomey Plage and is protected by breakwaters. It is situated close W of the mouth of Lac Nokoue (Lagune de Cotonou), which is usually silted up.

Winds—Weather.—The prevailing winds are from the SW. From mid-November until late February, N winds sometimes carry sand and dust from the deserts and reduce visibility in the vicinity of the harbor to as little as 0.5 mile.

The rainy season lasts from April until July and again from September to November. During December and January, night fog sometimes occurs, but it usually dissipates during the early morning hours.

Tides—Currents.—The tides rise about 1.6m at springs and 1.3m at neaps.

Tidal currents flow ENE across the harbor at rates of uTwo tanker berths, each 200m long, are situated at the inner side of the E breakwater. Tankers of up to 200m in length and 9.8m draft can be accommodated.

Depths—Limitations.—The entrance channel is dredged to a depth of 12m; the harbor basin is dredged to a depth of 11m.

The main quay, 1,320m long, is situated along the N side of the harbor. It provides eight berths and has depths of 10 to 11m alongside. There are facilities for general cargo, ro-ro, container, and bulk vessels. Vessels of up to 210m in length and 10m draft can be accommodated.

A fuel oil berth, 160m long, is situated at the E end of the main quay and can be used by vessels of up to 150m in length and 8m draft.

Two tanker berths, each 200m long, are situated at the inner side of the E breakwater. Tankers of up to 200m in length and 9.8m draft can be accommodated.

Aspect.—The E breakwater extends 0.4 mile SSW from a point on the shore lying 0.7 mile W of the mouth of Lac Nokoue. The W breakwater, 0.4 mile long, extends SE and E from a point lying 0.3 mile WNW of the head of the E breakwater. A short groin extends S from the elbow of this breakwater.

A light is shown from a framework tower standing on the W side of the mouth of Lac Nokoue (Lagune de Cotonou). A prominent radio mast is situated 0.4 mile NW of the light.

An outer fairway lighted buoy is moored about 1 mile ESE of the head of the W breakwater.

A prominent white house, surmounted by a flagpole, stands 1.7 miles NE of the head of the W breakwater. A church, with a prominent clock tower, is situated 0.9 mile NNE of the head of the W breakwater.

The conspicuous port control tower, surmounted by a radar scanner, stands near the end of the main quay, 0.4 mile NNW of the head of the W breakwater.

A water tower and a conspicuous building, 76m high, stand 0.8 mile NNW and 1 mile NE, respectively, of the head of the W breakwater.

Pilotage.—Pilotage, available 24 hours, is compulsory for all vessels over 100 nrt. Pilots can be contacted by VHF and board within about 1 mile ESE of the harbor entrance.

Regulations.—Vessels should send an ETA 24 hours in advance; if arriving on a Sunday or public holiday, the ETA should be sent before noon of the previous day. Vessels should also send their ETA, via the agent, 72 hours in advance, with a confirmation 36 hours in advance.

The following information should be sent to Port Control upon anchoring:

1. Time of anchoring.
2. Vessel's length overall.
3. Draft.
4. Agent's name.
5. Type and tonnage of cargo to be unloaded.

Vessels should also inform Port Control of the time of berthing.

Anchorage.—Vessels can obtain anchorage, in a depth of 11m, about 0.6 mile SE of the head of the W breakwater.

Caution.—An area, within which anchoring is prohibited, lies in the vicinity of the harbor entrance and may best be seen on the chart.

A dredged area, which may best be seen on the chart, lies close E of the head of the W breakwater and on the S side of

the entrance fairway. This area acts as a sand trap and less water than charted was reported (1995) to lie in its vicinity.

An unsurveyed area, which may best be seen on the chart, fronts the coast 1.5 miles E of the mouth of Lac Nokoue.

A prohibited area, which may best be seen on the chart, lies close W of the harbor. It fronts the coast in the vicinity of the palace and extends up to 3.2 miles offshore.

An abandoned pier, 300m long, is situated close E of the root of the E breakwater. Several stranded wrecks lie in the vicinity of this pier and may best be seen on the chart.

A dangerous wreck lies about 4 miles ESE of Cotonou Light.

Cotonou to Lagos

2.8 Between Cotonou and Lagos, 58 miles E, the coast is bordered by a narrow strip of sand and covered, for the most part, with bushes and a few scattered trees. An extensive series of lagoons lies behind this coast.

The seaward end of the border between Benin and Nigeria lies about 17 miles E of Cotonou.

Seme Oil Terminal (6˚18'N., 2˚39'E.) lies about 4 miles offshore, 13 miles ESE of Cotonou. The loading facility consists of an SPM, with four mooring buoys, lying in a depth of 18.3m. A submarine pipeline extends NNE from this terminal to the shore. Three production platforms are situated between 4 and 7 miles SSE of the terminal and are connected to the shore by submarine pipelines.

Tankers of up to 200,000 dwt, 270m in length, and 14.7m draft can be accommodated to load partial cargoes.

Pilotage.—Pilotage is compulsory and available only during daylight hours. Pilots, who act as mooring masters, can be contacted by VHF and board about 8 miles WSW of the SPM.

Regulations.—Vessels should send an ETA through Rogaland Coast Radio Station 7 days, 72 hours, 48 hours, and 24 hours in advance; if the ETA changes by more than 12 hours after the 24-hour message is sent, the revised ETA should be sent every 2 hours. The 72-hour message should include the following:

1. Vessel name.
2. ETA (date and local time).
3. Quantity of cargo required.
4. Estimated draft on arrival.
5. Technical details of loading equipment.
6. Any special requirements.

Vessels should maintain a continuous listening watch on VHF channel 16 when within 12 hours of arrival at the terminal. A continuous listening watch on VHF channels 6 and 9 should be maintained when the vessel is at the terminal.

Anchorage.—Temporary anchorage can be obtained within a designated area lying about 5 miles WSW of the SPM. This area has a depth of 24m and good holding ground composed of sand, mud, and shells.

Caution.—A restricted area, which may best be seen on the chart, surrounds the oil loading facility and extends up to about 11 miles from the coast. All vessels are prohibited from entering this area without prior permission.

2.9 **Badagri** (6˚25'N., 2˚53'E.) stands 1.5 miles inland on the N side of a creek, 27 miles E of Cotonou. This town is mostly hidden by bushes and palms, but a few white huts may be seen. Vessels can anchor, in a depth of 14m, mud and shells, about 1 mile offshore, S of the town.

Iworo (6˚25'N., 3˚01'E.), a village, is situated 8 miles E of Badagri. The coast between consists of several saltpans and a few villages. This village may be identified by a grove fronting two umbrella-shaped palm trees and a conspicuous red house.

The W part of the coast extending between Iworo and Lagos is very flat and bare, with few trees or villages. The E part has a densely-wooded background. A beacon, 14m high, stands on the coast 14 miles E of Iworo. A large wedge-shaped clump of trees is located 2 miles W of the beacon; it stands close inland and is very conspicuous from seaward.

Caution.—Between Badagri and Lagos, the current has been observed to set toward the shore.

Lagos (6˚24'N., 3˚24'E.)

World Port Index No. 46130

2.10 Lagos is the largest and main port of Nigeria. The harbor consists of a passage, about 6 miles long, which connects Lagos Lagoon with the sea. This passage leads between Lagos Island and Victoria Island, on the E side, and the mainland, on the W side.

The harbor includes two extensive port installations. The Apapa Quay complex is situated on the W side of the main channel; the Tin Kan Island complex is situated on the NW side of Badagri Creek, which is entered on the W side of the harbor, about 2.5 miles above the entrance.

Winds—Weather.—The winds are generally SW from mid-morning to evening, being light in January and stronger during July and August. During the night and in the early morning, the winds are usually light and from the N. Periods of early morning fog and haze sometimes occur, especially in January and February.

Tides—Currents.—The tides at the bar rise about 0.9m at springs and 0.7m at neaps.

On the bar, the direction and strength of the tidal currents vary, but generally, the ebb current sets diagonally across the bar. The flood current usually sets NE until within the entrance, when it sets N and up the harbor. The flood current runs during the dry season for about 5 hours while the ebb current runs for about 7 hours. In the rainy season, the flood current is sometimes imperceptible as it is almost equaled by the outflow of the river.

In the lower part of the harbor, the ebb current frequently attains a rate of 4 knots, with the flood current attaining a rate of 3 knots. In the upper part of the harbor, the ebb current attains a rate of 3 knots, with the flood current attaining a rate of 2 knots.

During the rainy season, the ebb current has been observed to attain a rate of 5 knots and the river level has been observed to rise by as much as 0.9m.

At about half ebb, a volume of deep-brown surface scum usually pours out of the harbor from the lagoon and extends up to about 3 miles offshore. During the rainy season (June to September), this scum discolors the water up to about 8 miles seaward of the harbor. However, very little discoloration occurs during the dry season.

It was reported (1988) that an almost constant ebb current sets along the Apapa Quay. This current was observed at times to attain a rate of as much as 6 knots.

Depths—Limitations.—The bar, which lies across the entrance of the harbor between the moles, was reported (1995) to have a dredged depth of 9.1m at LW.

The main port at Apapa has 2,459m of main general cargo quayage which provides twenty berths. These berths are 61 to 250m long and have depths of 5.8 to 11m alongside. A new container quay, 1,600m long, provides nine berths, with depths of 8 to 10.5m alongside.

Ijora Wharf, a bulk berth, is 122m long and has a depth of 5.8m alongside. There are also six tanker berths, with depths of 7.5 to 11m alongside. In addition, the port provides several mooring buoy berths, with depths up to 8m. There are facilities for general cargo, passenger, ro-ro, container, tanker, and bulk vessels. Vessels of up to 30,000 dwt, 259m in length, and 10.1m draft have been accommodated.

The complex at Tin Kan Island has 2,300m of main quayag,e which provides fourteen berths. These berths are 120 to 200m long and have depths of 9 to 10m alongside. There are facilities for general cargo, ro-ro, container, and bulk vessels.

A Single Point Mooring (SPM) stands about 2.5 miles SW of the head of the W mole. A restricted area, with a radius of 1,200m, surrounds the SPM. Only vessels using the SPM may enter the restricted area.

Aspect.—The coastline in the vicinity of the harbor is low. The entrance lies between the E mole, which extends 1.3 miles SSW from the SW extremity of Victoria Island, and the W mole, which extends 0.4 mile SE from the mainland shore.

Lagos Light is shown from a tower standing 0.9 mile NW of the root of the W mole. A racon is situated at this light. It was reported (1988) that the light tower is obscured by trees.

An outer fairway lighted buoy is moored about 3 miles SSE of the harbor entrance. The entrance fairway is indicated by a lighted range, which may best be seen on the chart, and marked by buoys. An SPM lies 1.5 mile S of the fairway buoy.

A conspicuous television mast stands 0.3 mile N of the root of the E mole, with a prominent hotel situated 0.4 mile N of it.

Pilotage.—Pilotage is compulsory for vessels over 1,016 grt and is only available from 0700 to 1800. Pilots can be contacted by VHF and generally board about 2.5 miles S of the head of the W mole.

Vessels should send an ETA via their agent 7 days, 4 days, 2 days, and 1 day prior to arrival, providing the following information:

1. Vessel name.
2. Call sign.
3. Agent's name.
4. LOA.
5. Tonnage, loaded.
6. Draft.
7. Type of cargo.
8. Last port of call.
9. Ship Entry Notice (SEN) number and date of issue.

Vessels should establish contact with the port authorities on VHF channel 16 when within VHF range. Upon anchoring, vessels should report the following information to the port auth-ories:

1. Ship Entry Notice (SEN) number and date of issue.
2. Agent's name.
3. Cargo details.

Regulations.—Two months prior to arrival in Nigerian waters, agents must register vessels with the Nigerian Ports Authority (NPA) in order to obtain a Ship Entry Notice (SEN). This does not apply to vessels carrying petroleum products in bulk or in ballast. Vessels cannot enter the territorial waters of Nigeria without a SEN.

Before entering any of the creeks, rivers, or channels in Nigerian waters, vessels are required to broadcast their intentions and keep a continuous watch on 500 kHz or 2182 kHz as necessary. Vessels should broadcast their positions frequently to facilitate safe navigation, but such messages must be discontinued on request by any naval, military, or port authority or any Nigerian radio station or authorized officer.

All VHF communication is subject to the following regulations:

1. VHF channel 16 is to be used as a calling and listening frequency by vessels, the harbormaster, the pilot station, and the signal station.
2. VHF channels 14, 13, 12, 11, and 9 are reserved for the sole use of the Nigerian Ports Authority (NPA). Agents and vessels are not to use these channels unless required to do so by the NPA.
3. VHF channels 22, 23, 24, and 25 are reserved as working channels for vessel to vessel and agent to vessel communications.
4. VHF channel 21 is reserved as a calling and listening frequency for communication between agents and their land mobile station.
5. VHF channels 17, 18, 19, and 20 are reserved as working channels for communications between shore stations other than the NPA.

The manner of operation under these restrictions will be:

1. All vessels will keep simultaneous listening watches on VHF channels 16 and 21. They will use VHF channel 16 when calling the harbormaster, pilot station, signal, or other vessels. Vessels will use VHF channel 21 when calling their agents.
2. All non-NPA fixed stations will keep watch on VHF channels 16 and 21. They will use channel 16 when calling the pilot station, harbormaster, and signal station. For calling their respective vessels, they will use VHF channel 21. After establishing contact, they will switch over to a mutually acceptable channel from amongst those assigned above as applicable. Agents will only use VHF to contact the NPA station as a last resort and only when the more conventional methods such as telephones and messengers fail.
3. The NPA stations will use VHF channel 16 for contacting vessels, tugs, and operational centers. They will use VHF channel 11 for other NPA internal communications. After establishing contact, these stations will select a working channel other than VHF channel 16, 14, or 11. The fire service will continue to use VHF channel 14 while maintaining a listening watch on VHF channel 16.

Traffic restrictions are, as follows:

1. Vessels are prohibited from passing each other in the main channel, between Lighted Bouy No. 7, moored 0.5 mile SE of the head of the W mole, and the head of the training mole, situated 0.8 mile NNW.

2. When two vessels are approaching each other in Apapa Channel, off the Apapa Quay complex, from opposite directions, the vessel stemming the tide shall wait at a safe position until the other vessel has passed, even though the former vessel had been accorded the right of way by the port signal station.

3. Vessels must reduce speed in the vicinity of the floating dock close N of the Apapa Quay complex.

Anchorage.—Vessels remaining outside of the harbor should anchor, in a depth of 18m, good holding ground, about 2.5 miles S of the main light, but clear of the wrecks. A heavy swell occurs at this roadstead, particularly in July, August, and September. Vessels may also obtain anchorage, in a depth of 13m, about 1.5 miles S of the main light.

It was reported (1981-2000) that vessels were anchoring or drifting up to 20 miles offshore in order to prevent being boarded by pirates.

Caution.—Buoys, which mark the harbor channels, may be frequently shifted to conform with changes in the depths. It was reported (1990) that several buoys were unreliable or missing.

It was reported (1990) that depths in the entrance fairway and within the harbor may be found to be as much as 2m less than charted.

Less water than charted was reported (1993) to lie in the vicinity of the head of the E mole.

Several wrecks, some dangerous, lie in the approaches to the port and may best be seen on the chart.

Vessels are cautioned that security off the West African coast and within some ports is a serious problem. In recent years (1986-2000) several attacks by pirates and thieves have been reported. These have generally taken place at the outer anchorages, but some have occurred while berthed alongside.

An area, within which anchoring is prohibited, lies in the vicinity of the harbor entrance. It extends up to about 3 miles seaward and may best be seen on the chart.

Due to the existence of submarine cables, an area, within which anchoring is prohibited, fronts the coast at the E side of the harbor entrance. It extends up to 15 miles seaward and may best be seen on the chart.

Lagos to the Niger Delta

2.11 **Kuramo Island** (6˚27'N., 3˚43'E.) forms the coast for 40 miles E of Lagos. The shore is fronted by a steep, sandy beach with heavy surf breaking on it. A prominent beacon stands on the coast, 10.5 miles E of Lagos.

Mosherelkawga (6˚25'N., 3˚41'E.), a village, stands 17 miles E of Lagos. A dangerous wreck, marked by a lighted buoy, lies about 2.7 miles SW of this village.

Orimedu (6˚25'N., 3˚56'E.), a prominent village, stands on the coast 16 miles E of Mosherelkawga.

The coast extending E of Orimedu continues as a sandy beach for 36 miles. For the first 21 miles, the undulating and dark bushy foreground stands out sharply against the lighter-colored background of the trees. The remaining part of this stretch of coast is very flat, though bushy, with no groves in the background.

The regularity of the coastal depths is interrupted 7 miles S of Orimedu by Avon Canyon (Avon's Deep), a submarine canyon, where the depths increase suddenly from 40m to over 180m.

Lekki (6˚24'N., 4˚07'E.), a village with a town situated close N of it, stands 11 miles E of Orimedu and 1 mile inland. It is situated W of three remarkable vistas. These vistas or lagoon entrances lie close to, 6 miles E, and 19 miles E of Lekki. They are 0.2 mile wide and appear open only when abreast of them.

Ajumo (6˚21'N., 4˚26'E.), a village, stands 19 miles E of Lekki and near the E of the three vistas. Overfalls occur about 9 miles S of this village.

2.12 A village, with two conspicuous palm trees, stands on the coast 5 miles E of Ajumo. An abrupt and remarkable change from sand to mud occurs in the nature of the coast close E of this village. The dry soil, palm trees, and brushwood are succeeded by swamps and mangroves. The coast also changes its direction to SE and depths of less than 11m are found to lie up to 6 miles offshore.

The termination of the sandy beach is a striking feature in the Bight of Benin. Vessels approaching from the W may navigate along the coast about 1 mile offshore, except in the vicinity of Lagos. However, after passing Ajumo, numerous muddy shoals, with depths of 5 to 7m, are then found within 3 miles of the shore.

The coast for about 6 miles SE of the termination of the sand is formed by a mud flat. The absence of any background trees makes those trees scattered along the shore conspicuous and the surf, which breaks about 2 miles offshore, is no longer heard. At the SE end of this mud flat, the coast assumes a somewhat firmer character and is interspersed with clumps of trees and scattered huts for about 15 miles. From this position to the entrance of the Benin River, 26 miles SE, the only distinguishable landmarks are two trees, which stand about 11 miles NW of the river entrance, and a few scattered groups of huts.

The Niger Delta

2.13 The **Niger Delta** (5˚30'N., 5˚10'E.) is said to begin at **Aboh** (5˚32'N., 6˚31'E.), a major trading station, which stands at the head, 130 miles from Forcados. It consists of numerous rivers, the best known being the Benin, Escravos, Forcados, Nun, Brass, New Calabar, and Bonny. All of these rivers unite with the many streams of the River Niger at or below **Ndoni** (5˚33'N., 6˚33'E.).

It is possible to ascend the River Niger from any of the mouths of the numerous rivers by utilizing the many tortuous creeks which connect the rivers and form inland waterways. These creeks are navigable throughout by boats and, in most cases, small vessels with light drafts can transit between 15 and 40 miles inland. However, the creeks and rivers of the delta should only be used by vessels with local knowledge.

When approaching any of the delta entrances, vessels generally first ascertain their proximity to land by the depths and the discolored appearance of the sea. The low shoreline is only indicated by isolated trees. These trees may appear as disconnected wooded islets because of the mirage distortion. On closer approach, the edge of the coastal forest appears as a solid line, broken only by the river entrance. Once over the bar and within the estuary, the river banks are fringed with mangroves fronting masses of inland forest.

Tides—Currents.—The current between the mouths of the Forcados River and the Nun River generally sets SE, except during the harmattan season (November to February), when it sets NW. Within depths of 16 to 18m, the current is irregular, with many eddies. Outside of these depths, the current sets at a rate of about 0.5 knot.

For the purpose of buoyage within the creeks and rivers leading to Koko, Sapele, Burutu, and Warri, the direction of the main flood current is considered as flowing from the Escravos bar toward the ports.

Directions.—Vessels should choose the river entrance where the bar offers the most favorable conditions for crossing. Once inside, the deepest route through the creeks can be chosen for proceeding to the other parts of the delta. In this way, the dangerous and shallow bars are avoided. The entrance to the Benin River is difficult to distinguish from seaward. Vessels usually do not enter this river through its mouth, but proceed via the Escravos River and Nana Creek.

Caution.—Vessels are warned that numerous wellheads, submarine pipelines, flares, oil fields, oil rigs, and production platforms, some disused and abandoned, exist within the 200m curve off the approaches to the rivers. The well heads may protrude over 5m above the seabed and may be unmarked.

Vessels are warned that a ground swell of varying amplitude usually prevails on all of the bars fronting the river entrances. Adequate underkeel clearances must be ensured.

2.14 The **Benin River** (5˚46'N., 5˚03'E.), though joined to the Niger Delta by Nana Creek and Chanomi Creek, has an origin entirely distinct from that of the River Niger. Its sources lie at the head of two small rivers which unite at Sapele, 40 miles ENE of North Point. Between the bar and Koko, a port lying 33 miles NE, the river is intersected by several creeks. Nana Creek enters the river through the SE bank and connects it with the Escravos River.

North Point (5˚46'N., 5˚01'E.), the N entrance point of the Benin River, is well-defined; breakers and heavy rollers extend up to 2.5 miles SW of it. The shore extending from this point on the S side of the river entrance forms only a gentle curve and is difficult to identify from the SW. Overfalls are reported to occur about 10 miles W of the point.

Discolored water may be observed as far as 9 miles seaward of the river mouth. The bar, composed of hard sand, is liable to change. It was reported (1981) to have depths of 2.4 to 2.7m. This entire bar frequently breaks heavily and sometimes with overwhelming force. Passage across the bar is not recommended.

The current off the mouth of the Benin River usually sets SE, but after the harmattan has been blowing, it is often reversed and sometimes sets with considerable strength. The tidal currents over the bar usually set ENE on the flood and SW on the ebb. In December, the flood current runs for 3 hours and attains a rate of 3 knots. The ebb current runs for over 9 hours and attains a rate of 5 knots.

Benin Road, lying 3 miles outside the bar and 5.5 miles from the river mouth, is the only anchorage available in this vicinity. The holding ground is good, but much rolling and pitching must be expected. Vessels may anchor, in a depth of 9m, black mud, about 5.5 miles SW of North Point.

2.15 Ukpokiti Marine Terminal (5˚43'N., 4˚50'E.) is a Floating Production Storage and Offloading (FPSO) facility located about 13 miles WSW of the mouth of the Benin River. The following information should be sent, via the agent, 7 days prior to arrival:

1. Vessel's name.
2. Vessel's ETA.
3. Master's name.
4. Arrival draft and dwt.
5. Deballasting time, if any.
6. Cargo requirements.

The ETA should be updated 72 hours, 48 hours, and 24 hours prior to arrival. Pilotage is compulsory; the mooring master boards about 3.5 miles SW of the terminal.

2.16 Escravos Oil Terminal (5˚30'N., 5˚00'E.) (World Port Index No. 46135) lies 11 miles WSW of the mouth of the Escravos River. It consists of an operations platform, 26m high, and two SBMs. No. 2 SBM is moored, in a depth of 19.8m, 1 mile W of the platform and can handle tankers of up to 120,000 dwt. No. 3 SBM is moored, in a depth of 30.5m, 5 miles WSW of the platform and can handle tankers of up to 350,000 dwt.

Vessels should anchor in a designated area lying about 3 miles WNW of the operations platform. Pilotage is compulsory and is available 24 hours. Pilots, who act as mooring masters, can be contacted by VHF and board in the vicinity of the anchorage area. They remain on board throughout the loading procedure. Vessels must have their engines ready for immediate use while moored at the terminal. Vessels must send an ETA to the terminal 72 hours, 48 hours, and 24 hours in advance, with the following information:

1. Vessel's name.
2. ETA.
3. Master's name.
4. Summer dwt.
5. Net registered tons.
6. Last port of call.
7. Next port of call.
8. Owner's name and address.
9. Quantity of cargo required.
10. Destination of cargo.
11. Nationality of officers and crew.
12. Quantity of cargo on board.
13. Maximum draft on arrival and departure.

Berthing details can be obtained from the terminal on VHF channel 10 or 16 when within VHF range.

The current at the terminal usually sets NNW, but it sometimes reverses to set SSE. Its strength varies between 0.5 knot and 1.5 knots. This current has been observed to reverse direction very quickly and cause vessels to swing heavily.

Unfavorable weather is usually expected from May through November.

Caution.—A restricted area, which may best be seen on the chart, surrounds the terminal. Vessels not proceeding to or from the terminal are prohibited from entering this area without prior permission.

It was reported (1970) that the approach to the terminal is somewhat difficult due to the existence of numerous gas flares. However, the coast and breakwater lying to the S of the river

entrance are radar conspicuous. There are platforms in ruins which stand about 3.25 miles S which barely show 5 meters above sea level and are poor radar targets.

2.17 The **Escravos River** (5˚34'N., 5˚10'E.) is the principal entrance of the delta for the ports of Koko, Sapele, Burutu, and Warri. Nana Creek, entered 7 miles within the mouth, leads into the Benin River and then to the ports of Koko and Sapele. Chanomi Creek, entered 12 miles within the mouth, leads S to the Forcados River and then to the ports of Burutu and Warri.

The entrance is liable to silt. The channel leading across the bar was reported (1986) to have a dredged depth of 6.4m. It was reported (1993) that vessels with drafts up to 6.4m could enter the river.

A main breakwater, about 4 miles long, extends WSW from a point on the coast located 1 mile S of the S entrance point. A light is shown from the head of this breakwater. A detached breakwater, about 0.5 mile long, extends NNE from the vicinity of the head of the main breakwater. A beacon, 9m high, is situated close SE of the S entrance point. A village and a water tower stand close N and close SSE, respectively, of the beacon. Another beacon, 9m high, is situated on the N entrance point and a radio mast, 91m high, stands 1.2 miles NE of it.

A light is shown from a metal framework tower standing 2 miles NE of the root of the breakwater. An outer fairway lighted buoy is moored about 7.2 miles WSW of the head of the main breakwater.

Nana Creek is entered 7 miles E of the mouth of the river. It leads in a N direction for 23 miles, but has many sharp bends.

Pilotage.—Pilotage is compulsory in the river. The pilot boards 2 miles SW of the Escravos breakwater. The Escravos Signal Station requests vessels send, on VHF channel 16, the following information before the pilot boards:

1. Vessel's name.
2. Call sign.
3. SEN number.
4. Crew.
5. Cargo details.

Pilotage is available during daylight hours only and should be arranged through the vessel's agent in the port of destination. Pilots are provided for Koko, Sapele, Burutu, and Warri.

Caution.—On the flood tide, a strong NW current sets across the bar and in the entrance.

It was reported (1995) that the buoys marking the approach and river channels were unreliable. Several were observed to be unlit and many were missing.

A submarine pipeline crosses Nana Creek, 4 miles NNE of its junction with the Escravos River. The depth may be reduced by as much as 2m in the vicinity of this pipeline.

2.18 **Koko** (6˚00'N., 5˚28'E.) (World Port Index No. 46140) is situated on the N bank of the river. It is a large settlement and extends for about 1 mile along the shore. The main quay is 137m long and has a depth of 7.3m alongside. Berthing is only carried out during daylight hours. Vessels of up to 140m in length and 6.4m draft have been accommodated alongside.

Caution.—Vessels should keep a good lookout for floating logs in the river, many of which are nearly submerged.

Vessels passing Koko should reduce speed to avoid damage to the river banks and to small craft moored at the quay.

2.19 From Koko, the Benin River trends in a general ESE direction, with two sharp bends, for 16 miles to Sapele. Above Koko, the banks of the river revert to mangroves for about 3.8 miles when they again change to open country with trees and palms.

Munro Island (5˚55'N., 5˚40'E.) divides the river and has several log storage lagoons. The main channel passes SW of this island.

Miller's Point (5˚54'N., 5˚42'E.) is the NW entrance point of the Ethiope River. A prominent radio mast is situated close WSW of this point.

2.20 **Sapele** (5˚54'N., 5˚41'E.) (World Port Index No. 46150), a major logging port, stands on the S bank of the Benin River, abreast the SE extremity of Munro Island. A conspicuous church stands in the N part of the town.

Depths—Limitations.—A private timber quay is situated on the W bank of the Ethiope River, 0.7 mile SE of Miller's Point. It provides 267m of berthage, with a depth of 4.9m alongside, and 144m of berthage, with a depth of 4.6m alongside.

The principal port installations are situated at Ogorode, 5 miles NW of Miller's Point. There is a total of 1,183m of quayage, which provides six main berths, with a depth of 10.5m alongside. There are facilities for general cargo, container, and ro-ro vessels. Vessels of up to 170m in length and 6.4m draft have been accommodated alongside.

In addition, several mooring buoy berths are situated in the river. These berths lie in depths of 4.9 to 7.6m and can accommodate vessels of up to 137m in length.

Anchorage.—Vessels can anchor, in a depth of 7.3m, about 0.3 mile above the E end of Munro Island.

Caution.—A submarine cable, marked by beacons, extends across the river, about 0.2 mile E of the SE end of Munro Island.

It was reported (1984) that the S bank in places between Munro Island and Sapele had extended into the river.

2.21 The **Forcados River** (5˚23'N., 5˚16'E.) is entered between Hughes Point and South Point, 7 miles SE. A navigable channel leads into the river between the shoalbanks extending from these points and is only about 1 mile wide.

South Point (5˚22'N., 5˚19'E.) is steep and wooded. A hulk lies on the beach on the N side of this point.

Hughes Point (5˚27'N., 5˚14'E.) is ill-defined, sandy, and backed by tall mangroves. Beacons are situated 0.5 mile SE, 2 miles SE, and 0.4 mile SE of this point. Moore Point, located 9 miles ESE of Hughes Point, is a steep and prominent bluff.

A bar fronts the river entrance, 7 miles seaward of the mouth, and lies between two lines of breakers, which are usually visible, except during the harmattan season. This bar was reported (1986) to have a least depth of 2.7m on it. Immediately within the bar, the water is smooth and the depths increase to over 9m. The channel leading over the bar and into the river is marked by buoys. It can be used by small craft with local knowledge.

2.22 **Meiji Oil Field** (5˚25'N., 5˚10'E.), consisting of numerous oil structures and platforms, lies centered 10 miles WNW of the entrance to the Forcados River.

Forcados Oil Field (5˚23'N., 5˚18'E.), consisting of numerous platforms, lies across the fairway within the bar.

Mesan Oil Field (5˚21'N., 5˚13'E.) lies centered 5.5 miles W of South Point.

Caution.—It was reported (1990) that the buoys marking the entrance channel are not reliable and some may be missing.

Numerous oil structures, flares, installations, and platforms are situated up to 10 miles seaward of the entrance to the Forcados River.

2.23 Forcados Oil Terminal (5˚10'N., 5˚10'E.) lies 15 miles SW of South Point. It consists of a platform and two SBMs. A submarine pipeline extends NE from the terminal to the shore. Vessels of 40,000 to 320,000 dwt, with drafts up to 19.8m, can be accommodated. There are no restrictions for length or beam. Vessels must have their engines ready for immediate use while at the terminal. Unfavorable weather is expected at the terminal from March to November. Vessels waiting to berth should anchor in designated areas lying about 3 miles W or 2 miles NW of the platform.

Pilotage is compulsory and is available 24 hours. Pilots, acting as mooring masters, can be contacted on VHF channel 8 and board in the vicinity of the anchorage areas. They remain on board throughout the loading procedure.

Vessels should send their ETA 7 days, 72 hours, 48 hours, and 24 hours in advance. Vessels should contact the terminal on VHF channel 8, as follows:

1. When within VHF range.
2. When anchored.
3. Upon arrival at the terminal.

After anchoring, vessels should maintain a continuous listening watch on VHF channel 8.

Caution.—A restricted area, which may best be seen on the chart, surrounds the terminal. Vessels not proceeding to or from the terminal are prohibited from entering the area without prior permission.

2.24 Chanomi Creek (5˚35'N., 5˚23'E.), which connects the Escaravos River to the Forcados River, leads in a S direction for 14 miles and is narrow and winding. The N entrance of this creek lies 12 miles E of the entrance to the Escravos River. The S entrance of the creek lies between Goshawk Point and Warri Point, 2.5 miles WNW. The coastal bank lying off Warri Point is marked by a lighted buoy. The fairway, which is marked by buoys and beacons, has general depths of 5 to 25m; the bar at the N end of the creek was reported (1986) to have a depth of 6.2m on it.

2.25 Port Forcados (5˚22'N., 5˚26'E.) (World Port Index No. 46160) lies 7 miles within the S entrance of the Forcados River and S of the S entrance of Chanomi Creek. It also includes the entrance to Muri Creek, lying E of the town of Forcados. The town is situated within Kwarra Point and is protected by a seawall. Vessels can anchor, in depths of 7 to 9m, good holding ground, N and E of Kwarra Point. During the tornado season (March to April and September to October), vessels should not anchor close to the shore.

The government wharf, situated 0.4 mile SE of Kwarra Point, is 58m long and has a depth of 6m lying close off it. Vessels with drafts up to 5.2m can berth alongside with lighters moored between them and the side of the wharf.

Burutu (5˚21'N., 5˚30'E.) (World Port Index No. 46165) lies on the S bank of the Forcados River, 4 miles E of Forcados. It is approached through Burutu Channel, marked by buoys, which has a least depth of 3.9m (1981). There is a main wharf, 229m long, and a new wharf, 91m long. Both have a depth of 6.4m alongside. A fleet of shallow-draft vessels operates from this harbor and carries cargo and passengers throughout the entire area. Vessels can obtain anchorage, in a depth of 7m, good holding ground, in the middle of the river, off the town.

2.26 Warri (5˚31'N., 5˚44'E.) (World Port Index No. 46170) lies on the N bank of the Warri River, 21 miles above its junction, at Warri Point, with the Forcados River. This junction is located close above the entrance to Chanomi Creek.

Winds—Weather.—The prevailing winds are usually from the SSW, but are variable during the harmattan season. Tornados are sometimes experienced at the beginning and end of the rainy periods (March to April and September to October).

Depths—Limitations.—The river channel is narrow and marked by buoys.

Four oil jetties front the refinery. They provide 121m of berthage, with a depth of 7m alongside.

A bulk quay fronts the steelworks, situated about 4 miles above Warri, and has a depth of 7m alongside.

The old section of the port has 1,500m of main quayage. It provides four berths for ocean-going vessels, with depths of 6.5m alongside.

The new section of the port has 1,600m of main quayage. It provides six berths for ocean-going vessels, with depths of 11m alongside. In addition, there are several mooring buoy berths situated in the river.

The port has facilities for general cargo, container, tanker, bulk, and ro-ro vessels. Vessels of up to 250m in length and 6.4m draft have been accommodated.

Caution.—Vessels are restricted by the depth on the bar at the entrance to the Escravos River. The Nigerian Ports Authority (NPA) at Lagos should be contacted in advance for the latest information.

2.27 The coast extending S from the entrance to the Forcados River to the entrance of the Nun River, 80 miles SSE, has the same monotonous features as that to the N. Dense forest and thick jungle rise from a narrow sandy beach which extends along the whole stretch of this coast. The surf breaks heavily in the rainy season on this beach and a heavy swell in this area generally causes a set toward the shore.

The shoreline is intersected by the mouths of several rivers. The entrances to these rivers are fronted by sandy bars which usually break completely across. All of the rivers are connected by creeks and communication by launches is maintained between places along the Forcados River and places along the Nun River throughout the entire year.

The **Ramos River** (5˚08'N., 5˚22'E.) flows into the sea 15 miles S of the entrance to the Forcados River. Its mouth, which is fronted by a bar, is about 0.5 mile wide and lies between two well-defined entrance points. Breakers extend up to about 3 miles seaward of the entrance and discolored water has been observed up to 7 miles seaward. Anchorage may be taken, in a

depth of 9m, black mud, outside the bar and about 5 miles W of the mouth.

The **Dodo River** (4˚53'N., 5˚29'E.) enters the sea 15 miles S of the mouth of the Ramos River. It was reported (1988) that the land located on the S side of this river entrance had extended up to about 2 miles NNW.

2.28 **EA Oil Field** (4˚49'N., 5˚21'E.) lies about 8 miles SW of the entrance to the Dodo River. The field consists of a Floating Production Storage Offloading facility and numerous associated wells and platforms, which may or may not be lighted. Entry into the charted safety zone surrounding the oil field is restricted.

Numerous concrete structures, intended to discourage illegal trawling in the area, have been placed on the sea bottom; these structures may decrease charted depths by as much as 1.5m.

It was reported (1988) that a riser pipe, 10m above sea level, is situated 6 miles WSW of the entrance to the Dodo River.

2.29 The **Pennington River** (4˚44'N., 5˚32'E.) flows into the sea 9 miles SE of the entrance to the Dodo River.

Pennington Oil Field (4˚37'N., 5˚25'E.) lies 7 miles SW of the entrance to the Pennington River. A gathering platform stands near the center of this field and a flare structure is situated close NE of it. A storage hulk is moored about 1 mile SW of the platform and several mooring buoys are situated 1 mile SW of it.

It was reported (1988) that a dangerous wreck lies about 1 mile E of the platform.

Caution.—A submarine pipeline connects the gathering platform, the storage hulk, and the mooring buoy berth. In addition, a submarine pipeline extends 10 miles SSE from this oil field to Middleton Oil Field.

2.30 The **Middleton River** (4˚32'N., 5˚41'E.) flows into the sea 14 miles SE of the Pennington River. It appears from offshore to be a wide estuary with an island lying in the entrance. In reality, the island is actually a group of tall trees standing on Hopkin Point, which divides the mouth into two branches.

Factory Point, the N entrance point of the river, is well-defined. Several very high trees stand on the S entrance point. Miller Island, lying close S of Hopkin Point, is covered with grass and low scrub. It is reported not to be visible until close inshore.

An outer lighted buoy is moored about 10.7 miles W of Hopkin Point. The bar, which lies about 1.3 miles W of Factory Point, has a least depth of 2.1m; however, the river entrance is obstructed by drying sand banks which lie between the bar and Miller Island.

2.31 **Middleton Oil Field** (4˚30'N., 5˚33'E.) lies centered 9 miles WSW of Factory Point. It consists of a production platform and several oil rigs. Submarine pipelines connect this field to Pennington Oil Field, 10 miles NNW, and the tanker terminal, 15 miles S.

The **Fishtown River** (4˚24'N., 5˚50'E.) flows into the sea 12 miles SE of the Middleton River. Its entrance is 0.2 mile wide and lies between two well-defined points. Between these two river entrances, the forest is somewhat removed from the coast and a belt of partially-cultivated land, with clumps of palms, intervenes.

2.32 **North Apoi Oil Field** (4˚21'N., 5˚47'E.) lies centered 3.5 miles SW of the mouth of the Fishtown River. It consists of a central gathering platform surrounded by several lighted well heads. A submarine pipeline connects this field with the offshore terminal, 13 miles SW.

Pennington Offshore Terminal (4˚15'N., 5˚37'E.) (World Port Index No. 46200) lies 16 miles SW of the entrance to the Fishtown River. It consists of a central platform, a floating storage vessel, moored to an SPM, and an SPM loading berth moored in a depth of 26.8m. Vessels of up to 250,000 dwt can be handled.

Winds—Weather.—The wind and swell at the terminal are mostly from a SW direction. The weather is generally good from November to May, but it may be unfavorable during the wet season (May to November). The currents are reported to be irregular and strong at times.

Pilotage.—Pilotage is compulsory; pilotage is available for berthing during daylight hours only, but is available 24 hours for unberthing. Pilots, who act as mooring masters, can be contacted by VHF and board about 2 miles SW of the SPM berth. They remain on board during the entire loading operation. Vessels should send an ETA 10 days, 96 hours, and 24 hours prior to arrival via the oil company office in Lagos. Vessels should then contact the terminal 2 hours prior to arrival on VHF channel 16.

2.33 The **Nun River** (Branch River) (4˚16'N., 6˚04'E.) flows into the sea 16 miles SE of the Fishtown River. It is entered between Cape Nun and Palm Point, 1.4 miles SE. This river was formerly used as the principal entrance into the Niger River. However, because of shoaling on the bar and continual changes in the channel above Akassa, 2 miles within the entrance, navigation is only possible by vessels with light drafts, even when the river level is high.

The river mouth is imposing when first entered, but, after reaching Akassa, the channel is almost entirely obstructed by numerous flats and drying sand banks. It is not until 25 miles N of Akassa that the river regains a width and depths commensurate with its importance.

The shores on either side of the river entrance are heavily wooded and form areas of vast swamp as they are at a level close to that of the river.

2.34 **Cape Nun** (4˚17'N., 6˚04'E.), the N entrance point, is somewhat low, with trees standing close behind it. Between this cape and Barracoon Point, 2 miles N, the W bank of the river is sandy, with trees extending almost to the edge of the water. A beacon, 9m high, is situated on Barracoon Point.

Palm Point (4˚16'N., 6˚05'E.), the S entrance point, is low, sandy, and covered with grass. Several trees stand about 0.3 mile N of the point. A square clump of trees, situated 0.5 mile inland and 2.5 miles E of the point, is somewhat conspicuous above the unbroken line of tree tops. A light is shown from a metal pile structure standing on the point and a beacon is situated 2 miles E of it.

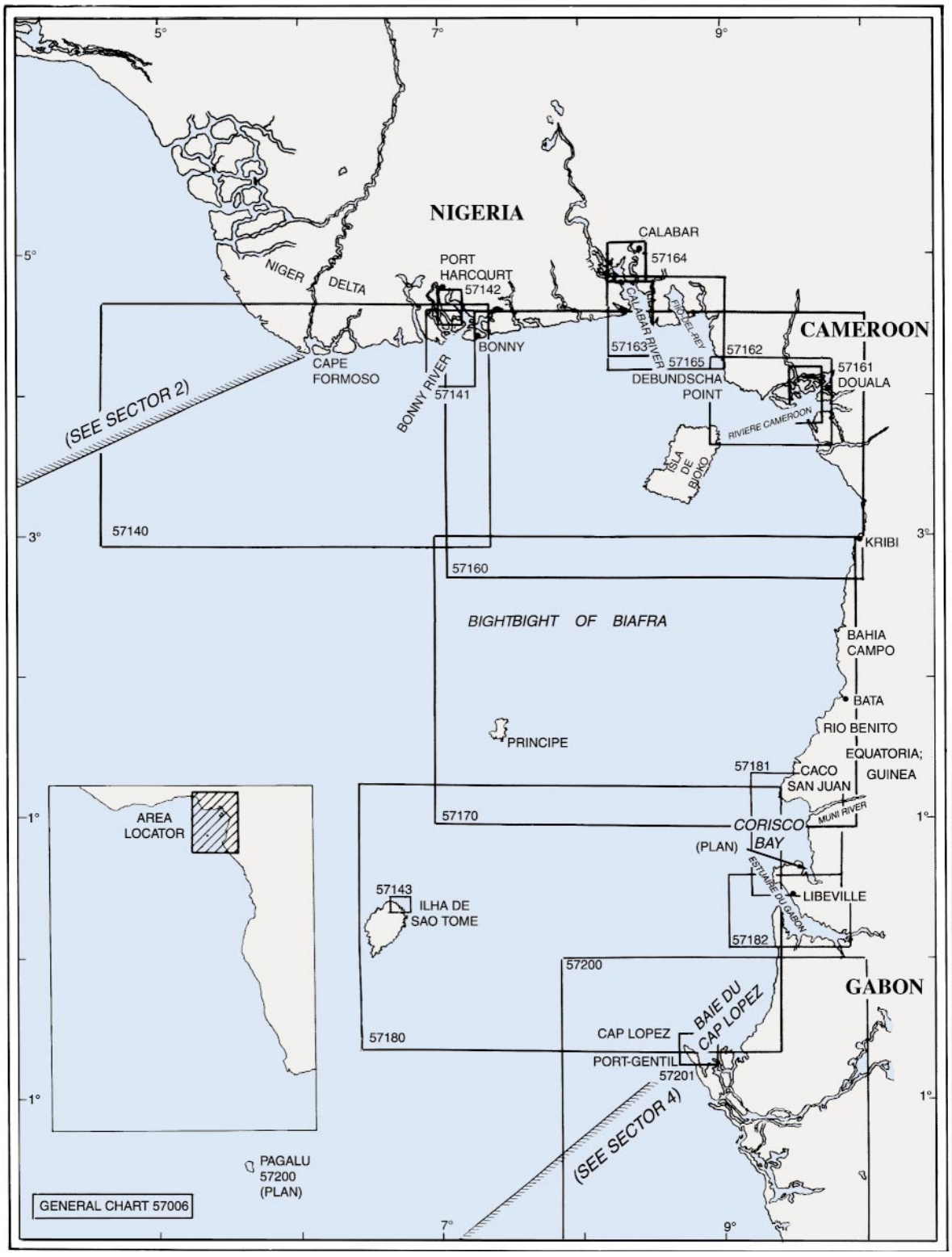
The bar fronting this river is considered to be one of the worst within the Niger Delta. The coast changes direction sharply in this vicinity and renders it fully exposed to the W and S. There is always a heavy swell on the bar and calm days are very few. The bar lies between the S extremities of two spits which extend up to about 4 miles S from each entrance point. The sea breaks heavily along the W spit and there are heavy rollers and surf along the E spit. The bar is composed of hard sand, with mud immediately outside of it, and has a least depth of 1.8m (1963).

During the rainy season, the bar frequently breaks all over, but it only breaks after half ebb in the dry season. Local knowledge is essential for crossing the bar. Discolored water has been observed up to 4 miles seaward of the bar. Anchorage may be obtained, free from rolling, in a depth of 11m, about 5 miles S of Palm Point. In this vicinity, the current from the river keeps the bow of the vessel heading N.

Caution.—During the harmattan season (November to February) or during heavy rains, the river entrance may be often obscured for several days.

2.35 Akassa (4˚19'N., 6˚04'E.) (World Port Index No. 46180), a small town, lies on the W bank of the Nun River, 2 miles N of Cape Nun. A small wharf, with an alongside depth of 1.2m, fronts the town. Vessels may anchor, in a depth of 14m, mud, in the middle of the channel, off Barracoon Point. Local pilots for the inland creeks are available here.

Cape Formoso (4˚16'N., 6˚05'E.) is the low and wooded tract which forms the S extension of the Niger Delta. This cape, located on the E side of the Nun River, also forms the E extremity of the Bight of Benin and is fully described in paragraph 3.2.



Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.

SECTOR **3** — CHART INFORMATION

SECTOR 3

NIGERIA, CAMEROON, AND GABON—CAPE FORMOSO TO CAP LOPEZ

Plan.—This sector describes the African coast between Cape Formoso and Cap Lopez, and includes the islands lying in the Bight of Biafra. The descriptive sequence is first from W to E and then from N to S.

General Remarks

3.1 The Bight of Biafra, known to Nigeria as the Bight of Bonny, is an extensive indentation in the African coast. Within the limits of this bight, numerous rivers discharge into the sea. The most important of these rivers are the New Calabar River, the Bonny River, and the Calabar River. The N shore of this bight is almost flat and dark in color. It is intersected by the mouths of the numerous rivers, forming the Niger Delta, each of which is obstructed by bars or shoals at the entrance. The coast consists of a belt which is 10 to 60 miles wide and covered with mangrove forests and swamps. Vast tropical forests stand inland of this coastal belt beyond which the ground becomes more open. There is little vegetation and very little rainfall in the extreme N part.

Fako (4˚13'N., 9˚10'E.), a conspicuous mountain, rises abruptly from the land on the NE shore of the bight. It reaches an elevation of 4,069m and is covered with trees and verdure of luxuriant growth, except in the vicinity of the rounded summit. Fako is also a volcano, but it has not been active since 1922. Another conspicuous peak, which stands about 9 miles SSW of Fako, ascends from the SW slopes of the mountain range. Although numerous other peaks rise from the sides of this range, they appear slight and scarcely break the uniformity of the slopes.

The more distant mountains, which stand about 30 miles N of Fako, attain elevations of 1,220 to 1,830m and tower aloft in huge peaks and rugged masses. A plain, from whose surface several conical hills rise abruptly, extends between the bases of these mountains. Several other nearby peaks, which are extinct volcanoes, are also visible from seaward.

The islands lying in the Bight of Biafra are evidently of volcanic origin and, together with the mountain ranges on the mainland, are probably the gigantic results of one and the same submarine upheaval.

Winds—Weather.—The Southwest Monsoon is the most significant of the local winds in this area. This large scale sea breeze, which extends up to about 150 miles inland, occurs in the N section over the Gulf of Guinea and adjacent coasts. It is strongest during the summer (June-August), but is prevalent all year. The monsoon is a deflection of the SE trade winds toward the heated continental interior. It acts very much like a land-sea breeze system and is felt up to about 10˚S. At Douala for example, while SW winds are prevalent during the afternoon, their frequency drops to 5 per cent during the early morning hours.

The Harmattan, a wind of continental origin, is a hot, dry wind from the NE quadrant. It reaches the shores of the Gulf of Guinea and extends seaward. This wind is prevalent from December through early March and is usually laden with fine dust which can reduce visibility in the form of haze. The Harmattan generally occurs between **Cape Palmas** (4˚22'N., 7˚44'W.) and **Douala** (4˚03'N., 9˚41'E.).

Tides—Currents.—The Guinea Current sets E along the N shore of the Gulf of Guinea. During June through October, a large part of this current is formed by an extension of the Atlantic Equatorial Countercurrent. During other months, it is considered to be an extension of the Canaries Current which sets S along the NW coast of Africa. The Guinea Current attains rates of 1 to 2 knots, but generally becomes weaker as it flows E and is very weak in the Bight of Biafra.

Regulations.—For information concerning Nigerian Ship Entry Notice (SEN), VHF communications regulations, and reporting requirements for Nigerian oil terminals, see Pub. 160, Sailing Directions (Planning Guide) South Atlantic Ocean and Indian Ocean.

Caution.—Vessels are warned that numerous wellheads, submerged obstructions, and offshore platforms, exist within the 200m curve between the approaches to the **Forcados River** (5˚20'N., 4˚50'E.) and the approaches to **Debundscha Point** (4˚06'N., 8˚58'E.). Some of these well heads may protrude more than 5m above the seabed and may be unmarked. Some of the platforms and structures may be disused, abandoned, and unlit. In addition, oil and gas exploration is being carried out along the coastal areas. Vessels should exercise care when navigating in this vicinity as many of the associated structures and objects are not charted.

The constant heavy surf along the coast generally prevents landing by boats and renders the river bars dangerous.

Several restricted areas lie offshore in the vicinity of oil and gas installations. Vessels not proceeding to or departing from these installations should keep clear of the areas.

Numerous submarine pipelines lie offshore and in many cases are not buried in the seabed. Depths over these pipelines may be reduced by as much as 2m.

Vessels are cautioned that security off the West African coast and within some ports is a serious problem. In recent years (1986-2002) several attacks by pirates and thieves have been reported. These have generally taken place at the outer anchorages, but some have occurred while berthed alongside.

Cape Formoso to the Cameroon River

3.2 **Cape Formoso** (4˚16'N., 6˚05'E.) is the general name given to the low, wooded tract which forms the S extension of the Niger Delta. This tract lies on the E side of the entrance to the Nun River and Palm Point, which is marked by a light, forms its S extremity.

Between Palm Point and West Point, 8 miles E, the coast is fronted by a flat and sandy shore. The surf breaks heavily on this shore and trees stand along it, close to the water.

Brass Oil Terminal (4˚04'N., 6˚17'E.), lying about 17 miles SE of Cape Formoso, consists of a lighted central platform which is equipped with a racon. No. 1 SBM and No. 2 SBM

are situated 1 mile E and 1 mile W, respectively, of the platform, in a depth of 27.4m. Vessels of up to 300,000 dwt and 22.8m draft can be handled, with a minimum length of 220m and a maximum length of 366m.

Vessels should send an ETA to the terminal via Lagos Radio 5 days, 72 hours, 48 hours, and 24 hours before arrival. Vessels should then contact the terminal by VHF before arrival and when anchoring. Anchorage is available, in depths of 27 to 29m, good holding ground, about 2.5 miles NE of the platform. Berthing takes place only during daylight hours. Pilotage is compulsory. Pilots can be contacted by VHF and board in the vicinity of the anchorage.

A platform, with a very conspicuous flare, is situated 10 miles SE of the terminal and is connected to it by a submarine pipeline.

The **Brass River** (4˚17'N., 6˚13'E.), formed by the confluence of several branches of the Niger River, is entered between West Point and East Point, about 1 mile ENE.

West Point is low, sandy, and covered with small bushes. It is reported to be difficult to identify from seaward. The forest trees extend to within about 300m of the HW mark in this vicinity.

East Point is thickly wooded, but the trees on it have the appearance of a steep bluff and do not extend to the water. The W bank of the river is backed by trees as far as the entrance to Akassa Creek, 2 miles N of West Point. Above the entrance to Akassa Creek, the mangroves and swamps begin. The E bank of the river has some small villages, hidden by trees, situated within 0.5 mile of East Point.

Anchorage may be obtained, in a depth of 11m, about 6 miles SW of West Point or 7 miles SE of East Point.

Brass (4˚19'N., 6˚14'E.), a small town, stands on the E bank of the river, about 1 mile NE of East Point. It is fronted by several small piers which are used by boats and small craft.

A bar, consisting of shoals, connects the seaward ends of two spits which extend S for 1.5 miles from the entrance points. The outer part of this bar lies 2 to 3 miles S of the river mouth. Breakers mark the spits and the bar. A passage, about 0.5 mile wide, leads over the center of the bar, where the breakers are less frequent than elsewhere. The fairway is shallow and marked by buoys. It is only used by small craft with local knowledge. The approach is dangerous because of the heavy rollers which break at frequent intervals even at HW.

Caution.—An unlit riser pipe, which was reported (1987) to be radar conspicuous, lies about 7 miles SSW of West Point.

In the rainy season, the river entrance is often completely obscured.

3.3 Between the Brass River and the Bonny River, about 50 miles E, the coast is intersected by several rivers. The mouths of these rivers are fronted by bars on which the sea generally breaks heavily. The rivers are not entered through their main mouths, but through creeks which connect them inland with other rivers having navigable entrances. Several beacons are situated along the shore between the river entrances.

The **River Saint Nicholas** (4˚18'N., 6˚25'E.) lies 12 miles E of the Brass River and is separated from it by slightly elevated wooded land. The W entrance point of the river is surmounted by trees, which are taller than elsewhere in the vicinity, and can be easily identified. Heavy surf fronts the river mouth and bars entry.

The **River Santa Barbara** (4˚19'N., 6˚36'E.) lies 11 miles E of the River Saint Nicholas and is separated from it by low forest land, fringed by a sandy beach. The entrance points are low and difficult to recognize from seaward. Heavy surf fronts the river mouth and bars entry to the river.

The **River San Bartholomeo** (4˚20'N., 6˚43'E.) lies 7 miles E of the River Santa Barbara and is separated from it by a sandy plain, 0.3 mile wide, which is interspersed with several shallow lagoons. The entrance points of the river are bold, being covered with tall trees. A shallow bar extends up to 3.5 miles S of the mouth.

The **River Sambreiro** (4˚22'N., 6˚53'E.) lies 11 miles E of the River San Bartholomeo; its entrance does not open when approached from the W until bearing less than 334˚. The W entrance point then appears low, sloping, and gradually rising to tall forest trees behind it. When the river mouth is fully open, bearing about 314˚, both entrance points appear as bold, high bluffs. Heavy surf fronts the river mouth and extends up to 3.5 miles offshore.

Fouche Point (4˚23'N., 7˚01'E.) is located about 8 miles E of the W entrance point of the River Sambreiro. From the vicinity of this river entrance, the point appears to be the extremity of the land as the E side of the estuary formed by the New Calabar River and the Bonny River is not visible until a vessel proceeds farther to the E. The entrance of Ke Creek, about 0.3 mile wide, lies close W of Fouche Point. A prominent radio mast is reported to stand on Fouche Point.

A dangerous wreck lies about 6 miles S of the point and is marked by a buoy. A stranded wreck, radar conspicuous, lies 3.2 miles SW of the point. Another stranded wreck is reported to lie about 6 miles SW of the point.

3.4 The **New Calabar River** (4˚23'N., 7˚02'E.) and the **Bonny River** (4˚18'N., 7˚04'E.) flow into a common estuary which lies between Fouche Point and Field Point, 7 miles E. The section of the Bonny River as far as Okrika, 25 miles above Field Point, is more correctly described as an arm of the sea, as it is insignificant and drains only a comparatively small area. The estuary is fronted by a bar which is more easily crossed than those of other rivers in the Niger Delta.

Inda Oil Field (4˚21'N., 7˚06'E.), with several platforms, lies centered about 4 miles SW of Field Point.

3.5 **Okono Terminal** (3˚59'N., 6˚18'E.) is a CALM buoy and an FPSO tanker. It is located about 25 miles SE of Field Point. A pipeline runs from the platform NNW to the coast.

Pilotage is compulsory. Pilots are available from sunrise to 1500. Pilots board in the anchorage area 2 miles N of the terminal.

A current meter is situated close SW to the platform; a wave recorder is 5 miles SSW of the platform.

The terminal can be contacted 24 hours on VHF channel 8; VHF channel 72 is used during vessel operations.

Vessels should send their ETA 72 hours , 48 hours, and 4 hours in advance to the terminal. The 72-hour message should contain the following information:

1. Vessel’s name and call sign.
2. ETA.

3. Cargo requirements.
4. Deballast time.
5. Maximum loading rate in barrels per hour.
6. Estimated draft on arrival.
7. If any sickness onboard or clean bill of health.
8. Last port of call.
9. Port of destination.
10. Summer deadweight tonnage.
11. Port of Registry/Country.
12. Master's name.
13. Any hull, bulkhead, valve or pipeline leaks on the vessel that could negatively affect loading or cause pollution.
14. Distance in meters from bow to the tanker's loading manifold and from the port rail to the manifold.
15. Confirm that the vessel is fitted with a bow chain stopper.
16. Advise if the bow chain stoppers are suitable for the terminal's 76mm mooring chain.
17. Acceptance and compliance with these Okono Terminal User Regulations and Procedures.

Tides—Currents.—Off Bonny, the current setting N begins 5 hours 30 minutes before HW and runs for 6 hours. It attains a maximum rate of 2.5 knots at springs. The current setting S begins 1 hour after HW and runs for 5 hours. It attains a maximum rate of 3.5 knots at springs. Between Field Point and Peter Point, 1.7 miles N, both currents set toward the entrance.

Depths—Limitations.—The bar fronting the estuary consists of a shoal area which connects the shallow banks extending from the entrance points to an extensive flat extending S from Yellow Island. Breaker Spit, lying 2.3 miles W of Field Point, forms the E side of the extensive flat. It dries in places and breaks heavily at half tide, even in fine weather. Western Breakers, a shoal, forms the SW part of the flat and its E edge is steep-to. This shoal breaks continuously in moderate weather, but not in calm weather.

Baleur Bank, with a least depth of 1.8m, lies centered 6 miles S of Field Point. It generally breaks at half tide and at all stages of the tide during rough weather.

Fouche Patches, a cluster of submerged heads, lies within the bar and has a least depth of 1.5m. This cluster lies on a shoal which extends about 3.5 miles SE from Fouche Point.

An entrance channel, 200m wide, extends NE across the bar and leads to the Bonny River. It is marked by lighted buoys and is dredged to a depth of 12.5m (1997).

Aspect.—Fouche Point, the W entrance point of the estuary, is low and wooded with tall trees, among which the sea breaks at HW. The W bank of the New Calabar River extends NNW from this point. It is lined by mangroves and thick bush and is intersected by many creeks.

Field Point, the E entrance point of the estuary, is low, sandy, and covered with grass. Bonny Light is shown from a framework tower standing 1.2 miles N of this point. A prominent beacon is situated 0.3 mile NNE of the point.

Rough Corner Spit, an area of drying patches, fronts Field Point; its seaward edge is marked by breakers.

Peter Point is located 2 miles N of Field Point. The E bank of the river between these points is lined by mangroves.

Yellow Island lies NE of Fouche Point and forms the E side of the New Calabar River. It is subject to continual change with islets and sandbanks constantly forming and reforming in this vicinity.

In the approaches to the estuary, the hard sandy bottom of the river is reported to extend seaward into depths of 11 to 12m. Off the other river entrances in this vicinity, the bottom at these depths is invariably formed by soft mud.

Pilotage.—Pilotage in the river is compulsory. Pilots can be contacted by VHF and board close S of the seaward entrance of the approach channel. River pilots for Onne, Okrika, and Port Harcourt board in the anchorage roadstead off the town of Bonney. Vessels should send an ETA message 7 days, 72 hours, 48 hours, and 24 hours prior to arrival.

Caution.—Due to the continual coastal erosion near the entrance of the estuary, the charted aspect of the land should not be relied upon.

When the Harmattan is blowing, the land in the vicinity of Fouche Point will generally not be visible to vessels entering the river.

The lighted buoys marking the entrance channel should not be depended upon and are reported to be often unlit at night. It was reported (1995) that several of the buoys were missing.

Vessels should contact the port authorities in advance to verify the latest depths in the river channel.

Several submarine pipelines, which may best be seen on the chart, extend across the river. The depths in the channel may be reduced by as much as 1.8m in the vicinity of these pipelines.

Fishing stakes line the sides of the river in numerous places.

Several spoil ground areas lie in the approaches and within the river and may best be seen on the chart.

It was reported (1986-2001) that several vessels, while anchored off the entrance channel, had been attacked by pirates. The authorities now advise vessels to drift within radar range of the outer lighted buoy instead of anchoring. During this same period, serious theft was being carried out from vessels berthed at the river ports and precautions should be taken.

3.6 Yoho Terminal (4˚00'N., 7˚28'E.) consists of an FPSO moored about 30 miles SE of Field Point. Yoho is a 24-hour terminal that is open at the discretion of the pilot.

Berthing is only permitted during daylight hours; unberthing can be done anytime. Vessels will be moored in tandem, bow to stern. Loading is done by a floating hose from the FPSO to the tanker.

Tugs and line boats are available to assist. A large tug will be secured to the stern of the tanker for the entire loading operation. The vessel's mooring tackle should comply with the Oil Companies Industrial Marine Forum requirements.

Tankers up to 350,000 dwt can be loaded at maximum a rate of 7,000 cubic meters/hour.

Pilotage is mandatory. Vessels will board the pilot either at the anchorages or where directed.

There are two anchorages. Yoho South, a circle with a radius of 1,700m, is centered at position 3˚58.7'N,7˚33'E. Yoho North, a circle with a radius of 1,700m, is centered at position 4˚06.6'N, 7˚31.3'E. Obstructions and abandoned well heads may lie outside these areas.

An abandoned well head is reported to be located in position 3˚59.6'N, 7˚32.9'E.

For ETA procedures, see Pub. 160, Sailing Directions (Planning Guide) South Atlantic Ocean and Indian Ocean.

All vessels must comply with the recommendations published in the current issue of the International Safety Guide for Oil Tankers and Terminals (ISGOTT).

In addition, vessels loading crude must comply with the Yoho Terminal regulations and any restrictions imposed by local government.

3.7 Bonny Offshore Terminal (4˚11'N., 7˚14'E.) lies about 13.5 miles SSE of Field Point, in a depth of 27.4m. It consists of a lighted platform and two SBMs. A submarine pipeline extends NNW from the terminal to the shore. Vessels of up to 320,000 dwt and 22.8m draft can be handled; there are no limitations for length or beam. Vessels should send an ETA via Lagos Radio 7 days, 3 days, and 2 days prior to arrival. Vessels should then contact the terminal by VHF 3 hours prior to arrival. Vessels should maintain a listening watch on VHF channel 8 and 16.

Pilotage.—Pilotage is compulsory. Pilots can be contacted by VHF and board at the anchorage. They act as berthing masters and remain on board throughout the loading operations. The designated anchorage area lies about 3 miles S of the platform; vessels must not proceed closer to the terminal without a pilot. While berthed at the terminal, vessels must have their engines ready with immediate use of full power available.

Caution.—A sunken oil rig, with the helipad and leg visible, lies about 12 miles SE of the terminal. Vessels should keep well clear of this wreck, which was reported to be marked by two buoys.

All vessels, other than tankers in the process of berthing or unberthing, should keep at least 3 miles away from the terminal platform.

During the rainy season (June to September), heavy swells may be encountered at the anchorage.

Gas is escaping to the surface in a position about 11 miles SE of Bonny Offshore Terminal. All vessels are advised to keep clear. The area of escaping gas is marked by buoys.

3.8 Okana Marine Terminal (3˚57'N., 7˚17'E.), a Floating Production Storage and Offloading (FPSO) facility, lies about 15 miles SSE of Bonny Offshore Terminal. Pilotage is compulsory and is available during daylight hours only until 1500. The pilot boards about 2 miles N of the terminal. Vessels should send their ETA 72 hours, 48 hours, and 4 hours in advance to the terminal.

3.9 Bonny (4˚27'N., 7˚10'E.) (World Port Index No. 46205) lies at the E side of the river. The town stands on very low land among mangrove swamps.

Tides—Currents.—The tides rise about 2.9m at springs and 1.9m at neaps.

Depths—Limitations.—The maximum draft to which a vessel can load is governed by the datum depth in the channel, the height of tide, and the underkeel clearance allowed.

It has been reported (1997) that the approach channel has been dredged to a depth of 12.5m over a width of 200m. The tide is variable, but the relevant factor is the height at the time of transit. The underkeel clearance allowed is dependent on the time of the year and is related to the height of the swell expected to be encountered in the channel. The underkeel clearance ranged from 0.76 to 1.22m (1989). The maximum size of vessel permitted at the terminal (1989) was 135,000 dwt, subject to review during the rainy season (May through October). The maximum length allowed was 320m and the maximum draft allowed was 11.2m. Vessels must have a minimum length of 161m, but there is no restriction for beam.

The inshore terminal lies close S of the town, at the E side of the river. It consists of three river berths, each formed by several mooring buoys. It has been reported (1996) that this inshore terminal has been closed. The mooring buoys have been removed, but obstructions and foul ground remain in the vicinity.

Mobil Jetty (Bonny River LNG Terminal) is a T-headed facility located on Peter Point. There is an alongside depth of 12.5m. Vessels of 20,000 to 120,000 dwt can be accommodated. The facility is surrounded by an Entry Restricted zone.

The Nigeria LNG Terminal (NLNG Terminal), a T-headed facility, stands about 1 mile NE of the Mobil Jetty. The terminal normally accommodates vessels of 30,000 to 60,000 dwt, but partially-loaded vessels up to 100,000 dwt can be handled. The facility is surrounded by an Entry Restricted zone.

The NPG Jetty, a T-headed pier, is currently (2002) under construction between these two jetties.

Shell Jetty, about 1 mile NE of the Nigeria LNG Terminal, is closed to shipping.

A storage tanker is moored in the river, 0.7 mile WNW of Peter Point. Vessels berth alongside this tanker and depart at the early part of the ebb tide.

It is reported (1996) that several platform structures have been established at the E side of the entrance channel, 3.2 miles SW of Field Point. A submarine pipeline extends E, NE, and N and connects these structures to a point on the mainland.

Pilotage.—Pilotage is compulsory from Fairway Lighted Buoy, along the Bonny River, and up to Port Harcourt, including Onne and Okrika. Pilots board, as follows:

1. Bonny Inshore Terminal:
   a. Condensate and LNG vessels—2 miles SW of Fairway Lighted Buoy.
   b. Other vessels—1 mile SW of Lighted Buoy No. 1.
2. Port Harcourt, Onne, and Okrika—in the anchorage off NPA Jetty.

Regulations.—Vessels should send their ETA 7 days, 72 hours, 48 hours, and 24 hours in advance, giving the following information:

1. Vessel name.
2. Flag.
3. Port of registry.
4. Call sign.
5. Official number.
6. Length.
7. Beam.
8. Charterer.
9. Owner’s name and address.
10. Agent’s name.
11. Voyage number, if used.
12. Master’s name.
13. Crew number and nationalities.
14. Last port of call.
15. Next port of call.
16. Tonnage and type of cargo.

Vessels should contact Bonny Signal Station on VHF channel 14 to obtain permission to proceed. Vessels should also maintain a continuous listening watch on VHF channel 8 and 14.

Anchorage.—Vessels proceeding to Bonny may anchor, in depths of 17 to 19m, about 4 miles W of Fairway Buoy. When anchored, vessels should report their date and time of arrival to the port authority by VHF.

3.10 Onne (4˚39'N., 7˚09'E.), a new port, lies in Ogu Creek and consists of a quay, 1,590m long, which provides six berths. The quay has a depth of 13.5m alongside and can accommodate vessels of up to 55,000 dwt. There are facilities for general cargo, container, ro-ro, and bulk vessels. The entrance channel within the creek is dredged to a depth of 9.2m.

3.11 Okrika (4˚43'N., 7˚05'E.) (World Port Index No. 46207), an oil terminal, lies on the NE side of the river channel, about 0.5 mile SSE of the island on which the town of Okrika stands. The oil refinery is fronted by an L-shaped jetty, 259m long, which has a square dolphin at the outer end. Coastal and ocean tankers up to 50,000 dwt and 192m in length can be handled. Berthing is carried out during daylight hours only. The approach river channel has a datum depth of 8.8m (1989). Vessels of up to 7.9m draft can berth; vessels of up to 9m draft can depart on the flood tide.

3.12 Port Harcourt (4˚46'N., 7˚00'E.) (World Port Index No. 46210), a railroad terminal, lies on the E side of a bend in the Bonny River, about 30 miles above the mouth.

Depths—Limitations.—There are eight principal dry cargo berths, which are 128 to 186m long; one palm oil berth; and one tanker berth. In addition, there are several mooring buoy berths, with depths of 8m. Generally, vessels of up to 183m in length and 7.6m draft can be accommodated. At the palm oil berth, which consists of a T-jetty with dolphins, vessels are limited to a maximum length of 146m. Berthing is carried out during daylight hours only. The approach river channel has a datum depth of 8.8m (1989).

Signals.—When two black balls are displayed from the signal station of the port, a vessel is known to be proceeding upriver from Bonny and outbound vessels should take necessary precautions, especially when navigating the bends.

Caution.—At the river berths, the flood tidal current attains a rate of 2.5 knots and the ebb current attains a rate of 3 knots.

3.13 Between the Bonny River and the Opobo River, 27 miles E, the coast is low and swampy. It is covered with mangroves and other trees which grow in brackish water. Further inland, the country is fertile and more elevated. Several beacons, which may best be seen on the chart, stand along this stretch of the shore.

The Andoni River, which is not used, enters the sea 11 miles E of Field Point. A platform is situated 9 miles S of the river mouth; a submarine pipeline extends NW from it to a point on the shore.

3.14 Ima Terminal (4˚13'N., 7˚23'E.) is located 13.5 miles SSE of the W entrance to the Adoni River. It consists of a floating storage tanker.

Pilotage.—Pilotage is compulsory. Pilotage is available during daylight hours for berthing; pilotage is available 24 hours for unberthing.

Pilots board in the anchorage area, which has a radius of 1.5 miles, centered about 3 miles SE of the terminal.

Regulations.—Vessels should send their ETA to the terminal operator 72 hours, 48 hours, and 24 hours in advance. Vessels should contact the terminal on VHF channel 72 prior to arrival.

Caution.—Vessels navigating along this stretch of the coast should not approach without local knowledge into depths of less than 15m.

Numerous oil wells lying off the this stretch of the Niger Delta have collapsed and created foul areas, which may best be seen on the chart.

An obstruction lies about 32 miles SSW of the entrance to the Opobo River. It was reported (1986 and 1988) that discolored water and breaking seas had been observed in an area lying about 4 miles WNW of this obstruction. Caution should be exercised.

3.15 The **Opobo River** (4˚27'N., 7˚35'E.) is entered between West Point and East Point, 1.8 miles NE. It is fronted by a bar which is subject to change. West Point is difficult to distinguish from seaward when bearing less than 015˚. East Point is fairly sharp, with forest trees standing near the water.

Opobo (4˚35'N., 7˚32'E.) (World Port Index No. 46220) is situated on the E bank of the river, 10 miles above the mouth. This town is a principal palm oil center and a number of factories, fronted by quays, stand along the river. The bar is formed by a horseshoe-shaped shoal connecting the outer ends of the spits, which extend up to about 2 miles S from each entrance point. The sea always breaks heavily on these spits. A channel leading across the E part of this bar was reported (1957) to have a least depth of 2.1m. The bottom of the bar is formed by sand, with mud on either side of it. Small vessels, with local knowledge, use the channel, but no pilots are available. Anchorage is available outside the bar, in a depth of 10m, about 4 miles S of West Point. However, because the prevailing current sets E, vessels nearly always lie broadside to the prevailing S swell.

3.16 Odudu Terminal (4˚00'N., 7˚46'E.), lying about 29 miles SSE of the entrance to the Opobo River, consists of a storage tanker moored bow-on to an SBM. Pilotage is compulsory. Pilots can be contacted by VHF and board in the anchorage area, which has a radius of 1.5 miles and lies centered about 3 miles NNE of the tanker. Vessels should send an ETA message 72 hours, 24 hours, and 4 hours in advance of arrival. Vessels are generally moored to the stern of the storage tanker. The terminal can handle vessels of between 80,000 and 280,000 dwt, with drafts up to 19.5m. All vessels must fly the Nigerian national ensign when in the vicinity of the terminal.

Caution.—Between the Opobo River and the Calabar River, 40 miles E, numerous oil and gas structures, platforms, well heads, buoys, and associated submarine pipelines lie up to 30 miles offshore.

3.17 Between the Opobo River and the Kwa Ibo River, 24 miles E, the coast consists of a narrow ridge of sand, only

about 1m above sea level and, in some places, only about 3m wide. Several mangrove swamps joined by lagoons and creeks lie behind this ridge.

Between the Kwa Ibo River and the Calabar River, 18 miles E, the coast is formed by a strip of sand, which is mostly under water during the rainy season, backed by a dense forest.

The **Kwa Ibo River** (4˚33'N., 7˚59'E.) is entered between Bluff Point and Egerton Point, 0.3 mile E. A bar fronts the river mouth. A channel leads across the bar and can be used by small craft, with drafts up to 2.7m, at HW. The entrance of this river can be recognized by a church, with a prominent spire, standing on the E bank, 1.5 miles within the mouth. A pier is situated in the estuary of the river and is used by craft associated with the offshore oil and gas facilities.

A group of storage tanks and a radio mast are situated about 1 mile E of the river entrance.

Caution.—A dangerous wreck is reported to lie about 11.2 miles S of the river entrance.

The Kwa Oil Field extends up to 50 miles seaward of the river entrance and consists of numerous platforms, structures, and submarine pipelines, which may best be seen on the chart.

3.18 Qua Iboe Offshore Terminal (4˚14'N., 8˚02'E.) lies 19 miles S of the entrance to the Kwa Ibo River. It consists of an operations platform, equipped with a racon, and three SPMs which are moored 1.2 miles SE, 1 mile SSE, and 3.4 miles SE of it. The terminal lies in depths of 25.9 to 27.4m and can handle vessels of up to 312,000 dwt and 22m draft.

Pilotage is compulsory and is available 24 hours.

Vessels should send an ETA 72 hours, 48 hours, 24 hours, and 6 hours prior to arrival at the anchorage area. Qua Iboe Control should be called on VHF channels 16 and 67.

The pilot requires the following information:

1. ETA at the pilot station.
2. Time of notice of readiness.
3. Boarding arrangement for officials.
4. Propeller immersion.
5. Portside derrick or crane to be ready for cargo gear basket.
6. Any defects.

When communication has been established with Qua Iboe Control on VHF channels 16 and 67, the vessel must provide the following information to the Berth Operations Platform (BOP):

1. Vessel's name and call sign.
2. ETA at Qua Iboe Terminal.
3. Last port of call.
4. Cargo requirements.
5. All tankers enroute to the SPMs must switch on their radar to identify the Racon (K) signal on the BOP as an aid to navigation.

The pilot boards in the following positions:

1. 2.5 miles SW of the BOP (4˚14.3'N., 8˚02.4'E.).
2. Qua Iboe anchorage area (4˚06.5'N., 8˚10.5'E.).

Caution.—Vessels should use extreme care when anchoring, as a submerged gas pipeline lies between the two anchorage areas.

On rare occasions, winds of up to 60 knots have been recorded at the terminal and are sometimes accompanied by heavy rain, thunder, and lightning. They are unpredictable in both force and direction.

Vessels bound for the terminal should proceed with extreme caution and approach from the SE as numerous structures, obstructions, platforms, above-water pipes, and submarine pipelines are situated in this vicinity.

Zafiro Terminal Storage Tanker (3˚51'N., 8˚07'E.) is moored about 22 miles SSE of Kwa Ibo Offshore Terminal. A restricted area, with a radius of 4.3 miles, surrounds the terminal.

3.19 The **Calabar River** (4˚33'N., 8˚23'E.) has an estuary which is entered between West Point, located 17.5 miles E of the Kwa Ibo River, and East Point, 13 miles ESE. This estuary is formed by the waters of several rivers. The Calabar River has no definite bar, but the entrance is obstructed by several shoal flats.

The border between Nigeria and Cameroon (Cameroun) is situated on the E side of the estuary. It lies in the vicinity of the Akpa Yafe River, which is entered about 9 miles N of East Point.

Tides—Currents.—The tides at the entrance to the main channel rise about 2.1m at springs and 1.6m at neaps. At Calabar, the tides rise about 1.5m at springs and 1.3m at neaps.

During the dry season (December to April), the flood current as far as Calabar begins 4 hours 30 minutes before HW. This current runs for 5 hours and attains its greatest rate 2 hours 45 minutes before HW. The ebb current begins 1 hour 30 minutes after HW. This current runs for 5 hours 45 minutes and attains its greatest rate 4 hours 15 minutes after HW. At springs, the flood current attains a rate of 1.5 to 2 knots. At springs and during the dry season, the ebb current usually attains a maximum rate of 2 to 2.5 knots. At the outer fairway buoy, this current has been observed to be less than 2 knots, but at **Parrot Island** (4˚49'N., 8˚17'E.), it has been observed to attain a rate of 3.5 knots.

Depths—Limitations.—Tom Shot Bank, with depths of less than 5m, is a large shoal area which extends up to about 11 miles S from the W side of the river entrance. Depths on this bank are very irregular and it should not be approached within depths of less than 7m.

It was reported (1986) that a low and sandy islet, about 0.7 mile long, had formed on the W side of Tom Shot Bank, 4 miles SE of West Point.

Outer Reef lies in the middle of the E edge of Tom Shot Bank. It is marked by breakers, even in the calmest weather, and forms a useful mark for locating the river entrance. In misty weather, these breakers are frequently the first distinguishing feature recognized in the area. The E side of Outer Reef is steep-to and may be approached with safety. A minor channel, used by small craft with local knowledge, leads NE through the NW part of Tom Shot Bank, adjacent to West Point.

Bakasi Bank, with depths of less than 5m, is a vast shoal area which extends up to about 12 miles SW and 8 miles S from the E side of the river entrance. It is composed of soft mud and usually covered, in many places, by numerous fishing stakes. When the land is not visible, vessels approaching the estuary may determine which side of the entrance they are on as there are no fishing stakes on Tom Shot Bank. A secondary channel

leads between the W side of Bakasi Bank and the E side of Tom Shot Bank. It is marked by buoys and has a least depth on the centerline of 3.9m (1990).

The main entrance channel leads NE through Tom Shot Bank and is entered about 13 miles S of West Point. It was reported (1995) to be 150m wide and to have a dredged depth of 8m. The best time to enter the river channel is 3 hours before HW at Calabar. No night transit is allowed.

Aspect.—The W side of the river entrance is low, sandy, and backed by high trees and large bushes. From the SW, West Point appears low and sandy, but Tom Shot Point, a steep bluff located 4 miles NE, is generally visible behind it. The E side of the river entrance is formed by the S shore of the Bakasi Peninsula. Between East Point and Sandy Point, 3 miles N, the E bank is sandy and backed by high mangroves.

An outer fairway buoy is moored about 13.5 miles S of West Point. The main channel is marked by buoys.

Caution.—The buoys marking the channels may be moved as conditions change. In addition, the outer buoys are very exposed and are liable to be out of position.

During the rainy season (May to October), the river entrance is often obscured by thick weather from seaward. During the Harmattan season (December through March), the river entrance is at times enveloped within a dense haze. This haze may last a week or more and reduce visibility to less than 2 miles.

Vessels should use extreme caution when approaching the estuary as, in addition to the offshore banks and shoals, there are numerous structures, obstructions, terminal platforms, above-water pipes, wellheads, and submarine pipelines situated in this area. Also, the coast in the vicinity of the estuary is very low and has few distinguishing features.

A restricted area, which may best be seen on the chart, lies S of Bakasi Bank and is associated with the oil and gas loading facilities.

Less water than charted was reported (1986) to lie about 4 miles NE of the outer fairway buoy.

A dangerous wreck, with masts visible, is reported (1989) to lie about 2 miles W of the S end of Outer Reef and is marked by a lighted buoy.

An isolated depth of 1.5m was reported (1986) to lie about 6.7 miles SSE of West Point, on the N side of the main channel.

A spoil ground area, which may best be seen on the chart, lies 4.3 miles NE of the outer fairway buoy.

Several unsurveyed areas lie in the approaches to the river and may best be seen on the chart.

3.20 Calabar (4˚58'N., 8˚19'E.) (World Port Index No. 46230) is situated on the E bank of the Calabar River, about 42 miles above the entrance. The new port lies 5 miles above the town and the old port.

Depths—Limitations.—The old port has a principal cargo berth, 75m long, which can accommodate vessels of up to 160m in length and 4m draft. There are two oil berths, with a depth of 8m alongside, which can accommodate vessels of up to 150m in length. In addition, there are 11 mooring buoy berths in the river.

The new port consists of a quay, 860m long, which provides six berths. It has a depth of 9m alongside and can accommodate vessels of up to 170m in length and 7m draft. There are facilities for general cargo, bulk, container, and ro-ro vessels.

Pilotage.—Pilotage is compulsory for vessels over 1,000 grt. Vessels should send an ETA via Port Harcourt or Lagos Radio 7 days, 4 days, 3 days, and 1 day prior to arrival. Vessels should anchor E of **Parrott Island** (4˚49'N., 8˚17'E.) and contact the port by VHF in order to request pilotage. Movements are carried out in daylight only.

Anchorage.—Vessels may anchor outside the estuary, in a depth of 22m, mud, about 11 miles SSW of West Point, clear of any pipelines.

Caution.—Several spoil ground areas lie within the river and may best be seen on the chart.

Large floating tree trunks, partly submerged, may be encountered within the river.

Several submarine cables extend across the river and may best be seen on the chart.

3.21 Antan Oil Terminal (4˚13'N., 8˚20'E.) (World Port Index No. 46225) is situated about 19 miles SSE of West Point. It lies in a depth of 38m and consists of a 285,000 dwt storage tanker moored by a stern yoke to an SPM platform. Vessels of between 100,000 and 270,000 dwt can be handled and are moored bow to bow with the storage tanker. Vessels should send an ETA 72 hours, 24 hours, and 4 hours before arrival. Any change to the ETA of 1 hour or more should be reported immediately. The 4-hour message should be sent on VHF channel 16 and should include the time required to discharge ballast before arrival.

Pilotage is compulsory and is available during daylight hours only until 1600. Pilots, acting as mooring masters, can be contacted on VHF and board in the anchorage area, which has a depth of 45m and lies about 4.5 miles S of the terminal.

All vessels must fly the Nigerian national ensign when in the vicinity of the terminal.

3.22 Kole Oil Terminal (4˚15'N., 8˚30'E.), the petroleum port for Rio-del-Rey, is situated about 14 miles S of the Bakasi Peninsula. It consists of a production platform, a storage tanker, and two SBMs. The main SBM is moored 2.5 miles SSW of the storage tanker, in a depth of 30m. It can handle vessels of up to 250,000 dwt and 22m draft. A designated anchorage area lies centered 1 mile S of the SBM.

Vessels should send an ETA 72 hours, 48 hours, and 24 hours before arrival. Pilotage is compulsory. Pilots, provided from Douala, act as mooring masters. Pilots can be contacted on VHF channel 16 and board about 2 miles S of the main SBM.

Caution.—The terminal lies in the SE part of a large restricted area, which may best be seen on the chart.

3.23 Moko Abana Oil Field (4˚12'N., 8˚26'E.), consisting of several platforms, lies centered 9 miles SW of Kole Terminal to which it is connected by a submarine pipeline.

Moudi Marine Terminal (Victoria Oil Terminal) (4˚08'N., 8˚27'E.) lies 7 miles S of Kole Oil Terminal, in a depth of 57m. It consists of two wellhead platforms, a production platform, a flare structure, a storage tanker, and an SBM. Vessels of between 50,000 and 280,000 dwt can be handled. A designated anchorage area lies 2 miles ENE of the SBM.

Vessels should send an ETA, via Douala, 72 hours, 48 hours, and 24 hours before arrival; the terminal should be contacted when within 60 miles.

Pilotage is compulsory. Pilots, acting as mooring masters, can be contacted by VHF and board in the vicinity of the anchorage. Vessels must have their engines available at all times.

Caution.—The terminal lies within a restricted area which may best be seen on the chart.

3.24 Rio-del-Rey (4˚30'N., 8˚45'E.) is an extensive, open, and shallow bay formed by the confluence of several rivers. It lies between **West Point** (4˚29'N., 8˚42'E.), located at the SE end of the Bakasi Peninsula, and Betika Point, located 18 miles SE. This latter point forms the termination of a ridge of hills. Several villages stand along the shores of the bay and may be seen from offshore. A sandbank fronts the bay and only small craft with local knowledge transit this area.

The Meme River flows into the E side of the bay, about 12 miles N of Betika Point. The coast turns abruptly S from the mouth of this river and consists principally of low cliffs with many large caves.

Madale de Coto Point is located 2 miles SSE of Betika Point. Madale Rocks, the largest being 1.2m high, extend up to 1.5 miles SW from this point.

A wreck, with a depth of 15m, lies about 9 miles SW of Madale de Coto Point.

Caution.—Oil exploration and production are being carried out off the entrance to Rio-del-Rey and numerous associated platforms and structures are situated in this vicinity.

3.25 Bibundi Bay (4˚11'N., 8˚58'E.) is entered between Madale de Coto Point and Debundscha Point, 10 miles S. The Bibundi River empties into this bay, about 4 miles SE of Madale de Coto Point. The entrance of the river is narrow and difficult to identify. It lies between a sandy spit, on the N side, and a steep and rocky bank, on the S side. The village of Bibundi stands close within the entrance of the river and is a trading center for numerous large coca plantations. It is mostly concealed by trees.

Anchorage may be obtained, in a depth of 18m, sand and mud, in the S part of the bay, NNE of Debundscha Point. Vessels with local knowledge can also obtain good anchorage off Bibundi in a depth of 11m, mud, about 0.8 miles offshore. Vessels entering the bay from the S should not approach closer than 1.5 miles from the coast and should keep in depths of 10m or more.

Debundscha Point (Dabundscha Point) (4˚06'N., 8˚58'E.), which is marked by a light, consists of a bold headland terminating in red limestone cliffs, up to 15m high.

3.26 Izongo Point (4˚04'N., 9˚01'E.), located 3 miles SE of Debundscha Point, appears as a prominent bluff from the NW or SE. It is fronted by a drying reef and several sunken rocks. The village of Izongo, with several sheds, stands at the head of a small bay lying close N of the point. It is fronted by a small pier with a depth of 1.8m alongside at LW.

Between Izongo Point and Batoki Rock, 6.5 miles SE, the shore is intersected by several small streams and the sea usually breaks heavily on it.

Batoki Rock (Batoke Rock), 15m high, lies close offshore and is connected to the coast by a rocky reef. Habicht Rock, with a depth of 1m, lies 0.7 mile SE of Batoki Rock and about 0.4 mile offshore. Foul ground extends between it and the coast.

3.27 Limboh Point (4˚01'N., 9˚08'E.) is located 1.3 miles ESE of Batoki Rock. It is fringed by shoals with depths of less than 10m. A refinery is situated 0.3 mile N of the point and a tall chimney, marked by a light, stands close to it.

A quay, 150m long, fronts the refinery and has depths of 10 to 12m alongside. It can accommodate vessels of up to 130m in length.

Limboh Point Oil Terminal (4˚00'N., 9˚08'E.), lying 1.5 miles S of the point, consists of an SBM which is moored in a depth of 21m. Vessels of up to 90,000 dwt, 243m in length, and 18m draft can be handled. Pilotage is compulsory. Pilots can be contacted by VHF and board about 1 mile S of the SBM.

Caution.—A restricted area, which may best be seen on the chart, extends up to 2 miles S from Limboh Point. Only vessels proceeding to the terminal may navigate within this area.

A submerged rock is reported to lie close to the quay and is marked by a lighted buoy.

3.28 Nyeme Point (4˚01'N., 9˚09'E.) is located l.5 miles E of Limboh Point. A small bay lies between these points, but it is foul in many places and should only be approached by vessels with local knowledge.

Ambas Bay (4˚00'N., 9˚10'E.) is entered between Nyeme Point and Cape Nachtigal, 5 miles SE. The NW shore of the bay, up to 1.3 miles E of Nyeme Point, is fairly steep-to. The NE shore of the bay is bold and overlooked by four hills, 153 to 207m high.

Ambas Island, located 2 miles SSE of Nyeme Point, is the outer and westernmost island lying in the bay. It is 51m high, narrow, and covered with trees and brushwood, except at the N end.

Mondoleh Island is located 1.4 miles E of Ambas Island. It is 98m high and the largest island in the bay. The island is composed of volcanic rock and is heavily wooded along its sides.

The Pirate Islands, a group of islands and rocks, lie on a shoal spit which extends 0.8 mile S from the N shore of the bay. Bobia Island, located 1.5 miles N of Ambas Island, is 33m high and the largest of the group.

The village of Bota, a railroad terminal, is situated on the NW shore of the bay. It is fronted by a mole which is used by small craft and lighters.

3.29 Cape Nachtigal (3˚57'N., 9˚13'E.) is the S extremity of the Monkey Peninsula. A main light is shown from a tower, 14m high, standing on this cape. A dangerous wreck is reported to lie about 0.5 mile S of the light.

Limbe (Victoria) (4˚01'N., 9˚12'E.) (World Port Index No. 46260) is situated at the head of Morton Bay, which lies on the NE side of Ambas Bay. It is the port for **Buea** (4˚10'N., 9˚14'E.), which stands 10 miles inland. A range, consisting of lighted beacons, leads between Ambas Island and Mondoleh Island to the roadstead where cargo is worked. Vessels can

anchor, in depths of 12 to 16m, good holding ground, in four designated anchorage berths. Local knowledge is required.

The flood current sets S, and the ebb current sets N, between Ambas Island and the Pirate Islands. These currents are of about equal duration and at times are strong in the vicinity of Ambras Island and Mondoleh Island.

Caution.—Between May and September, the swell rises quickly in the bay and causes a heavy surf and violent undertow. This swell makes landing very dangerous and at times impossible. It consists of two principal parts. One of these parts sets fairly constantly E between Ambas Island and the Pirate Islands and varies according to existing conditions. The other part, which arises when the winds are fresh or after a tornado, enters from the S or SW between Ambas Island and Mondoleh Island. This latter part of the swell runs straight into Morton Bay, turning and combining with the usual swell from the W, and finally breaks on the rocks.

3.30 Man of War Bay (3˚57'N., 9˚13'E.), with depths of less than 5m, lies between Cape Nachtigal and Reef Point, 1.3 miles E. Cape Bimbia, located 0.7 mile SE of Reef Point, is the S extremity of the base of the Cameroon Mountains (Cameroun Mountains). The land behind this cape rises gradually and regularly from the coast.

Fish Point is located 0.7 mile NE of Cape Bimbia. A shallow bay lies between this point and Dikulu Point, 1.5 miles NE. Nicol Island, which is 73m high and thickly wooded, lies in the entrance to this bay. Dikulu Bay lies between Dikulu Point and Pegel Point, 0.8 mile NE. This bay is very shallow, but anchorage may be obtained close outside it, in a depth of 7m. Several prominent factories, consisting of large white buildings, stand on the coast to the N of Nicol Island.

The **Bimbia River** (3˚58'N., 9˚17'E.) is entered between Entrance Point, marked by a light, and the coast, 0.5 mile E. The approach to the mouth is obstructed by a bar which lies SE of Cape Bimbia. This bar was reported (1984) to have a least depth of 5.2m, but the depths in this vicinity are subject to frequent change. A fairway, marked by buoys, leads over the bar to the river. Above Entrance Point, the river deepens and has depths of 18 to 20m in places.

A ground swell is usually encountered on the bar and allowance must be made to ensure a minimum underkeel clearance of 0.3m. Vessels normally cross the bar at half speed. The bottom consists of fine sand and mud. It is soft and vessels which touch bottom are not damaged.

3.31 Tiko (4˚04'N., 9˚22'E.) (World Port Index No. 46270), a large town, stands on the mainland close W of Tiko Island, about 8.5 miles NE of Entrance Point.

Depths—Limitations.—A narrow causeway connects the town with the W end of Tiko Island. Tiko Wharf is situated at the E end of the island. It lies parallel to the river and has a berth, 137m long, with depths of 5.8 to 7.6m alongside. Vessels of up to 150m in length and 6.1m draft have been accommodated.

Pilotage.—Pilotage is compulsory. Pilots can be contacted by VHF and are provided from Douala. They generally board within Ambas Bay, close NE of Mondoleh Island.

Caution.—Numerous fishing stakes generally obstruct the entrance bar.

The buoys marking the fairway are moved to conform to frequent changes in the banks.

The sharp turns in the river must be navigated with great caution.

3.32 From the E entrance point of the Bimbia River, the coast trends 8.5 miles SE and then 4.5 miles ENE to Cap Cameroun. The shore is low and covered with mangroves, but has been reported to be visible, in clear weather, from up to 12 miles seaward. Bancs Bimbia fronts this portion of the coast and extends up to 5.5 miles offshore. This bank has depths of less than 5m and the sea breaks heavily on it. A drying shoal was reported (1961) to lie on the SE side of this bank.

3.33 Cap Cameroun (3˚54'N., 9˚28'E.), surmounted by a tower, is a low, but well-defined point which is covered by tall and bare trees. A racon was reported (1993) to be situated at the tower.

A dangerous wreck was reported (1991) to lie, in an approximate position, about 17.5 miles SW of Cap Cameroun.

The **Cameroon River** (Estuaire Cameroun) (3˚50'N., 9˚26'E.) has its estuary lying between Cap Cameroun and Pointe Souellaba (Pointe Suellaba), 7 miles SE. This estuary is formed by the outlet of several rivers and creeks, the principal one being the River Wouri. The port of Douala lies on the SE side of the River Wouri, about 15 miles NE of the entrance.

Pointe Souellaba, surmounted by a pylon, is a long, low, and narrow point which is gradually being eroded by the action of the sea. The trees standing within 0.2 mile of the point appear thinned out and ragged, while only the trunks remain at the seaward extremity. A racon was reported (1993) to be situated at the pylon.

Tetes de Chiens, with depths of less than 5m, fronts Point Souellaba. It extends up to about 6 miles W, 4 miles NW, and 3.5 miles N from the point. The sea always breaks on this shoal, except at high water slack, and can be seen from a considerable distance.

Winds—Weather.—During the dry season (December to February), the sea breeze may blow from the SW at up to force 5. During the ebb current at spring tides, this breeze may produce a very nasty, short sea in the estuary which is dangerous for small boats.

Tides—Currents.—At Cap Cameroun, the tides rise about 2.3m at springs and 1.9m at neaps.

The spring tides are fairly regular, but the neap tides cannot be relied on. The water has been frequently observed to be rising at Douala, although an ebb current has been running at the time. Generally, the evening tides tend to be higher, especially after a strong afternoon sea breeze. In the rainy season, the level of the river is usually 0.4m higher than in the dry season.

The flood tidal current attains its maximum strength about 2 hours 30 minutes before HW at Bonny. The ebb current attains its maximum strength about 3 hours 30 minutes after HW at Bonny. The maximum strength of both these currents is usually about 2.5 knots at springs. During the rainy season, the ebb tidal current may run for as long as 8 hours and attain a rate of 2.7 knots. The flood current may then run for only 4 hours 30 minutes and attain a maximum rate of less than 2 knots.

In the estuary S of Cap Cameroun, the ebb tidal current has been observed to attain a rate of about 5 knots at springs.

Vessels are cautioned against getting too close to the E side of the channel, as the ebb tidal current sets strongly toward Tetes de Chiens.

Depths—Limitations.—The estuary is approached through a channel which leads over the outer bar and between Bancs Bimbia, on the NW side, and Tetes de Chiens, on the SE side. The outer bar lies between the seaward extremities of these banks.

The channel leading to Douala has a least dredged depth of 5.8m at LW (1994). Generally, vessels of up to 200m in length can transit the river.

Aspect.—The approach channel is marked by lighted buoys and unlighted buoys. An outer lighted buoy, marking the seaward entrance, is moored about 10.5 miles SSW of Cap Cameroun. Lighted tide gauges are situated 1.2 miles ENE of Cap Cameroun and 5.5 miles W of Point Souellaba. Base/B9 Lighted Buoy is moored about 3.2 miles E of Cap Cameroun.

Within the entrance, the estuary comprises Baie Mocouchou and Baie Modeaca, on its NW side, and Crique Malimba and Baie de Manoca, on its SE side. The main river channel extends NE to Douala.

Anchorage.—If obliged to anchor outside the bar, vessels can ride easily, out of the strength of the tidal current, in a depth of 11m, about 12.5 miles SW of Cap Cameroun.

Vessels may anchor off this coast during all seasons of the year, but should never do so in a depth of less than 12m, except in cases of emergency. When in depths of less than 12m, the swell begins to assume the character of rollers and causes vessels to ride very uneasily.

Caution.—A local magnetic anomaly exists in an area lying about 7 miles ENE of Cap Cameroun.

Vessels should reduce speed when crossing the outer bar in order to avoid a build up of water under the keel.

The ebb tidal current flows very strongly over Tetes de Chiens, especially at springs.

The buoys marking the channel are moved as necessary to conform to frequent changes in the banks.

3.34 Douala (4˚03'N., 9˚41'E.) (World Port Index No. 46280) lies on the SE bank of the River Wouri which empties into the estuary of the Cameroon River, 9.8 miles ENE of Cap Cameroun. Bonaberi is situated on the NW bank and connected to Douala by a prominent bridge.

Winds—Weather.—Douala has a hot climate throughout the year. Along the coast in this vicinity, the rainy season lasts from April to November and the dry season lasts from November until March. The prevailing winds are from the W during the day and from the E at night.

Tides—Currents.—The tides at Douala rise 2.6m at springs and 2.2m at neaps.

Off the port, the flood current attains a maximum rate of 2.5 knots and the ebb current a maximum rate of 3 knots. These tidal currents generally set in the direction of the channel axis.

Depths—Limitations.—There is 2,000m of principal quayage at Douala, which provides 11 berths. These berths have a depth of 8.5m alongside and have facilities for handling general, bulk, timber, and oil cargo. In addition, there is 560m of total quayage, with a depth of 6.5m alongside, which is used by fishing vessels and 925m of total quayage, with depths of 5.5 to 6m alongside, which is used by vessels associated with offshore oil exploration.

At Bonaberi, the main facilities include a bulk quay, which is 300m long, with a depth of 8.5m alongside; a banana quay, which is 150m long, with a depth of 7m alongside; a container and ro-ro terminal, which has 500m of quayag,e with a depth of 11m alongside; and a tanker dolphin berth, which has a depth of 7m alongside.

Generally, vessels of up to 30,000 dwt and 200m in length can be handled. It is reported (1994) that vessels of up to 8m draft can transit the river channel and be accommodated in the port at springs; vessels of up to 6.4m draft can be accommodated at neaps.

Pilotage.—Pilotage is compulsory. Vessels should send an ETA message, with a request for pilotage, at least 24 hours before arrival. This message must include the length and fresh water draft (in meters) of the vessel. Pilots can be contacted by VHF and board at the anchorage in the vicinity of Base/B9 Lighted Buoy. Vessels are required to maintain a listening watch on VHF channel 16 while transiting the channel.

Anchorage.—Anchorage may be obtained, in depths of 7 to 11m, within a designated area lying SSE of Base/B9 Lighted Buoy. Vessels are required to maintain a listening watch on VHF channel 16 while at this anchorage.

Caution.—Heavy pieces of floating driftwood may be encountered throughout the length of the River Wouri.

The navigational aids were reported (1995) to be unreliable. Several of the channel buoys were observed to be missing, unlit, or out of position.

The port authorities should be contacted prior to arrival, as the minimum depth in the channel is subject to siltation.

Due to numerous armed robberies in the vicinity of the port, it was reported (1993) that personnel should use caution and not go ashore at night.

The Cameroon River to Bahia de Corisco

3.35 Between Pointe Souellaba and Cabo San Juan, 120 miles S, the hinterland is generally lower in the N part of the area than in the central and S parts. The coast is uniformly low and thickly wooded with large prominent forest trees lining the shore. The beaches are generally sandy, with detached rocky patches in places.

At times, a heavy surf breaks along all of this coast and makes landing dangerous. The coastal waters, up to a depth of over 20m, have been reasonably well surveyed between the estuary of the Cameroon River and Baie Campo, 90 miles S. However, to the S of the latter bay, they have only been sketchily surveyed.

The **Riviere Sanaga** (3˚34'N., 9˚36'E.) lies 17 miles SSE of Pointe Souellaba and has two mouths. Bouche Benge, the N mouth, and Bouche Boungo, the S mouth, are separated by Ile Malimba. The island and the banks at the mouths change frequently. The mouths are obstructed by a sandy bar with depths of less than 1m. Depths of 2 to 2.7m lie within 1 mile of the river entrances and depths of less than 5m lie up to 2 miles offshore. Edea, an administrative center, is situated on the S bank of the river, about 45 miles above the entrance. It can only be reached by small craft. Lac Ossa, a large expanse of water,

lies W of Edea and can be used to land seaplanes. Anchorage is available for small craft with local knowledge, in depths of 5 to 14m, good holding ground, within Bouche Boungo.

3.36 Baie Panavia (3˚10'N., 9˚52'E.) lies between Bouche Boungo and Pointe Garajam, 37 miles SSE. This bay has depths of 9 to 12m lying between 3 and 6 miles offshore. Secure anchorage can be found by vessels, with local knowledge, in depths of 9 to 11m, mud, anywhere off the shore of the bay because on this coast the tornadoes blow offshore.

The **Riviere Njong** (3˚16'N., 9˚54'E.) lies 23 miles SE of Bouche Boungo; its mouth is hardly visible from seaward. A sandy bar obstructs the entrance to this river. It has depths of 0.6 to 1.8m, but is subject to frequent changes.

The **Riviere Lokoundje** (3˚13'N., 9˚56'E.), lying 3.5 miles S of the Riviere Njong, also has a mouth which is difficult to identify from seaward. Its entrance is obstructed by a bar, with a depth of 1.5m, and is only used by small craft. Three mooring buoys are reported to be situated about 1.5 miles W of the river entrance and are used by barges.

Several dangerous wrecks, which may best be seen on the chart, lie up to 4 miles offshore in the vicinity of the entrances of the Riviere Njong and the Riviere Lokoundje.

Longji (3˚05'N., 9˚59'E.) lies 12 miles SSE of the Riviere Njong and is the site of several prominent factories. An anchorage roadstead, with a depth of 7m, mud, lies off this settlement and is marked by a buoy.

Several factories are situated 4 miles S of Longji. One of them, consisting of a white house standing on a hill, is very prominent from seaward. Several dangerous rocks front the coast in this vicinity and Roche Plantation, which dries, lies about 0.5 mile offshore.

Pointe Garajam (3˚00'N., 9˚56'E.), low and wooded, is rounded in shape and sometimes difficult to distinguish. It is fringed by several rocks which lie on the beach and show up distinctly against the white sand. Two groups of rocks lie about 1 mile W of the point. One group consists of above-water rocks and the sea breaks on the other.

3.37 From Pointe Garajam, the coast trends in a SSW direction for about 40 miles to the mouth of the Riviere Campo. The shore extending up to 23 miles S of Pointe Garajam is fringed by a fine beach without mangroves, but rocks lie up to 0.5 mile seaward in many places. Vessels transiting this area are advised to keep at least 2 miles offshore and in depths of at least 20m.

Further S, the foreshore consists of a long narrow strip of densely-wooded lowland which is fronted by a beach of yellow sand. This beach is interrupted in places by what appear to be the mouths of small rivers. Several plantations, with patches of lighter green, and a number of villages, with groups of brown huts, show the coast to be inhabited. It is reported that several landing places front the various villages.

Off this coast, the depths decrease gradually toward the shore. The bottom is generally clean and mostly consists of sand and mud. It forms a good holding ground, although in places there are patches of coral. Vessels are advised to ascertain the nature of the bottom before anchoring.

Mont Nisus (2˚56'N., 10˚07'E.), an isolated hill, rises 12 miles SE of Longji. It is conical in shape and may be identified easily from seaward.

Monte Elephant (2˚47'N., 10˚00'E.) is 519m high. This hill resembles an elephant when seen from the W and has a conical appearance when seen from the S.

Les Mamelles, rising about 7 miles inland, stand near the center of a range of hills which extends S from Monte Elephant.

Pointe Brima (2˚57'N., 9˚55'E.) is located about 3.5 miles SSW of Pointe Garajam. A rock, which dries 1.5m, lies close N of the point and is marked by a beacon. A dangerous wreck lies about 1.2 miles WNW of the point.

Caution.—Numerous oil exploration drilling rigs and structures, the positions of which change frequently, are generally encountered offshore in many places along this part of the coast.

3.38 Kribi (2˚56'N., 9˚54'E.) (World Port Index No. 46290) is a small roadstead port where cargo is worked by vessels at anchor. The harbor basin is fronted by a bar and can only be used by small craft. Local knowledge is advised as a group of detached rocks lie in the middle of the approach channel, close inside the bar. The fairway is indicated by a lighted range. Good anchorage is available, in a depth of 7m, sand and mud, 0.8 mile WNW of the harbor. An outer lighted buoy is moored about 1 mile WNW of the harbor. Two mooring buoys are reported (1994) to be situated about 0.5 mile W of the harbor.

The surface current in the vicinity of the entrance is much influenced by the Riviere Kienke, which flows into the head of the harbor basin. It is constantly setting out at rates of 2 to 5 knots, depending on the state of the tide and the level of the river.

A bridge spans the river at the head of the harbor basin and a church, with a prominent spire, stands near its S end. A conspicuous pylon is situated 0.3 mile N of the church.

Caution.—Several oil exploration drilling rigs and structures are generally encountered in the approaches to Kribi, within the 200m curve; vessels are advised to navigate with care.

3.39 Grand Batanga (2˚50'N., 9˚53'E.), a village, stands 6 miles SSW of Kribi. It has several prominent buildings, factories, and churches. The waterfall of the Riviere Lobe, in the N part of the village, is prominent during the rainy season, but is insignificant during the dry season. Anchorage can be obtained, by vessels with local knowledge, in depths of 10 to 12m, gray sand, off Grand Batanga. A landing place lies between two factories, but is reported to be very dangerous.

Baie Banoko (2˚48'N., 9˚54'E.) is a slight indentation which extends S for about 5.5 miles from Grand Batanga. The shores are low, wooded, and fronted by a sandy beach with several factories on it. A thick clump of large trees stands near the center of this indentation and appears as a dark hillock from a distance. There is always a surf along the shores and landing should never be attempted.

Ebome Marine Terminal is located 4 miles W of Baie Banoko. The terminal has an SPM, which can accommodate vessels up to 230,000 dwt. The depth at the SPM is 30m. There is a

stand-by anchorage 2 miles W of the SPM. Pilots board the vessel at the anchorage. The terminal lies within a restricted area, as shown on the chart. Only vessels using the terminal are authorized to enter the restricted area.

Rocher du Loup (Rocher Wolf) (2˚37'N., 9˚50'E.), 9m high, is a small but prominent rock which lies close offshore, 13.5 miles S of Grand Batanga. It is shaped like a regular truncated cone and the summit is surmounted by a small beacon. This rock forms an excellent mark and is surrounded by rocks and foul ground, on which the sea breaks violently.

Pointe Nanga Bouda (Pointe Gertrude) (2˚30'N., 9˚46'E.), located 7 miles S of Rocher du Loup, is low, sandy, and covered with trees. It is surmounted by a beacon, but is generally hard to distinguish. Rocks extend up to 0.4 mile W of the point. A landing place lies on the N side of the point.

3.40 Pointe Weber (2˚25'N., 9˚49'E.) lies 5.5 miles S of Pointe Nanga Bouda. A detached patch, with a least depth of 2.7m, lies about 2.3 miles W of this point.

Baie Campo (2˚23'N., 9˚48'E.) is entered between Pointe Weber and Cabo Campo, 6 miles SSE.

Cabo Campo (2˚19'N., 9˚47'E.), although low and wooded with a sandy beach, forms a salient point. It is fronted by a line of rocks and breakers which extends up to 0.7 mile offshore and should be given a wide berth.

The **Riviere Campo** (2˚21'N., 9˚50'E.) enters the sea at the head of Baie Campo, 3.5 miles NE of Cabo Campo. The boundary between Cameroon (Cameroun) and Equatorial Guinea lies in the vicinity of this river. The mouth is obstructed by a bar which breaks heavily, especially in the dry season, and has depths of 1.5 to 2m on it. Within the entrance, the river is wide and quite deep.

A trading station, with several prominent white-roofed factories, stands on the N bank of the river mouth. Anchorage may be obtained, according to draft, ENE of the trading station, but vessels should not proceed into depths of less than 5m because of the swell and the cross currents. During strong W winds, this anchorage is almost untenable by small vessels.

Islotes Pongue (2˚12'N., 9˚45'E.), a group of three rocks, lies about 3 miles offshore, 8 miles SSW of Cabo Campo. The central and largest rock, which is 5.5m high and whitened by guano, assumes the appearance of a sail when viewed from some positions. The other two rocks, lying close N and S, are generally darker in color. However, all three rocks have been reported to appear black at times, which may be accounted for by the absence of birds at certain seasons. The sea breaks violently against these rocks and it is not known whether a safe navigable channel leads between them and the mainland.

Caution.—Several dangerous wrecks, some stranded, lie off this stretch of the coast and may best be seen on the chart.

3.41 Cabo Bata (Punta Mbonda) (2˚06'N., 9˚45'E.), located 13 miles S of Cabo Campo, is low, rounded, and wooded. A reef extends up to 1.5 miles seaward of the cape, beyond which the water suddenly deepens. An aeromarine light is shown from a brick tower, 35m high, standing on the cape; a prominent tower is situated 1 mile NE of it.

Bahia de Bata lies between Cabo Bata and Cabo Dos Puntas, 26 miles SSW. The depths along the shore of this bay are irregular and it is inadequately surveyed. The bottom is generally formed of mud, but in many places there are patches of rock, especially in the S part.

The shores of the bay are low and wooded. They are fronted by a narrow and sandy beach which is interrupted by the mouths of several rivers. The most prominent rivers are the Rio Mbia, the northernmost, which enters the sea 1.5 miles SSE of Cabo Bata and is used by small craft; the Rio Biadibe, which enters the sea 3 miles S of the Rio Mbia; and the Rio Utonde, which enters the sea 5 miles S of the mouth of the Rio Biadibe.

3.42 Utonde (1˚55'N., 9˚48'E.), a village and railroad terminal, stands on the N bank of the Rio Utonde and consists of a few scattered houses and a factory. Good anchorage can be found, in depths of 7 to 11m, mud, off the mouth of the river, but local knowledge is advised.

Punta Eviando (1˚54'N., 9˚48'E.) is located 11.5 miles S of Cabo Bata and fronted by a rocky ledge which extends up to 0.4 mile seaward. A group of radio masts stands 0.4 mile SE of this point, in the vicinity of an airfield. A buoy is reported to be moored about 4 miles NW of the point.

Colline Selle and Colline Table are two hills which rise 24 and 27 miles, respectively, inland from the mouth of the Riviere Campo. Both are very prominent and appear isolated from off this part of the coast. Las Siete Colinas, a mountain range, stands about 15 miles inland and presents seven distinct heights when viewed from seaward. **Monte Agudo** (1˚44'N., 9˚54'E.), the central mountain of this range, is 850m high and conspicuous.

3.43 Bata (1˚52'N., 9˚46'E.) (World Port Index No. 46305) is a small roadstead port where cargo is worked by vessels at anchor. A dog-legged wharf, 370m long, fronts the town and is used by barges and small craft. A pipeline extends to a position about 1 mile W of the wharf. Vessels can moor to a buoy which is situated at the seaward end of the pipeline, but this buoy is reported (1993) to be in a dilapidated condition.

A conspicuous mission building, with twin domes surmounted by crosses, stands in the NE part of the town. The government house, which stands on high ground, and a cathedral, which is situated close S of the mission building, are prominent.

Vessels can anchor, in a depth of 11m, sand, about 1.5 miles offshore, but local knowledge is advisable as several dangerous wrecks lie in the approaches. The holding ground is fairly good, but the swell can be heavy. Anchorage is also available for small vessels, in depths of 5 to 7m, about 0.4 mile WNW of the head of the wharf.

3.44 Puerto Nuevo (Puerto Macias Ngueema) (1˚49'N., 9˚44'E.) lies 1 mile S of the mouth of the Rio Ecuco and 3 miles SW of Bata, which it is considered a part of. The harbor consists of an L-shaped jetty extending W from the shore. A basin, protected by breakwaters, lies near the root of the jetty. It has depths of 3 to 4m and is used by fishing vessels and small craft.

The outer leg of the jetty, which is 320m long, provides four general cargo berths, with depths of 11 to 12m alongside. Several mooring buoys are also available to assist in berthing. A local pilot is available and boards 0.5 to 1 mile off the jetty. Berthing instructions are provided by the harbor authorities on

VHF channel 16. Anchorage is available, in a depth of 16m, about 0.5 mile W of the head of the jetty.

Caution.—It was reported (1991) that shoals were extending seaward from the mouth of the Rio Ecuco and several wrecks lie off the entrance.

It was reported (1993) that the local pilot spoke only Spanish.

It was reported (1991) that vessels moored at the inner berths of the jetty are frequently subject to a heavy swell.

Numerous oil exploration drilling rigs, structures, and well heads may be encountered in the approaches to Bata and Puerto Nuevo.

3.45 Cabo Dos Puntas (1˚41'N., 9˚36'E.), the S entrance point of Bahia de Bata, is low, wooded, and fringed by a sandy beach. It is fronted by a rocky reef, which extends up to about 1.5 miles offshore, and should be given a wide berth. The sea breaks over the whole of this reef, but more violently at the N end.

Punta Ngaba is located 5.8 miles SW of Puerto Nuevo and 6.7 miles NE of Cabo Dos Puntas. A light is shown from a metal tower, 24m high, standing on this point.

Punta Mbode (1˚37'N., 9˚36'E.) is located 3 miles S of Cabo Dos Puntas. A light is shown from a framework tower, 12m high, standing on this point. Several shoals, with depths of 0.9m and on which the seas break heavily during the ebb tide, extend up to about 0.8 mile seaward of the point.

The **Rio Benito** (Rio Mbini) (1˚36'N., 9˚37'E.) is entered between Punta Haybero, located 1.5 miles SE of Punta Mbode, and Punta Joho (Punta Arena), 0.8 mile SSW. It is navigable by small craft, with drafts up to 1.8m, for about 12 miles above the mouth. The village of Rio Benito extends S from Punta Joho and is fronted by a small pier which can accommodate vessels of up to 4.3m draft.

The town of Bolondo is situated 0.5 mile N of Punta Haybero and the American Mission, with a prominent white pigeon house, stands in it. A prominent church is situated near Punta Joho and a light is shown from a framework tower standing 1 mile SW of it.

Large vessels can anchor, in a depth of 12m, about 4 miles NW of the river mouth. Smaller vessels can anchor, in a depth of 8m, about 2 miles W of Punta Joho, but during the dry season (May to November) there may be considerable swell in this position. Cargo handling is carried out at these roadsteads.

Caution.—Several wrecks, some dangerous, lie in the approaches to the Rio Benito.

3.46 Between Punta Joho and Cabo San Juan, 29 miles SSW, the coast is low, undulating, and wooded. It is fringed by a narrow and sandy beach which is intersected by the mouths of several rivers. The shore is fronted in many places by rocky shoals, some of which uncover. Inland the land rises and attains a height of 585m at Monte Bombouanyoko, which stands 10 miles NE of Cabo San Juan.

La Mibia, a remarkable mountain, rises 26 miles SE of Punta Joho. It is 1,200m high and has a double summit.

Anchorage is available, in a depth of 5m, sand, off the mouth of the Rio Ndote, which flows into the sea 6 miles SE of Punta Joho. This river may be entered by boats with local knowledge.

Punta Ilende (Dione) (1˚23'N., 9˚28'E.) is fronted by rocky ledges which extend up to about 0.8 mile offshore.

Banco Mitra (1˚25'N., 9˚19'E.) lies about 10 miles WNW of Punta Ilende. This bank has depths of 29 to 31m, with depths of 69m close round it. A patch, with a depth of 11.9m (existence doubtful), lies approximately 10 miles SSW of the bank.

3.47 Ceiba Terminal (1˚24'N., 9˚13'E.), a Floating Production Storage and Offloading (FPSO) facility, lies 16 miles NW of Cabo San Juan. A CALM buoy is situated about 1 mile E of the FPSO. There are depths of 40m in the vicinityof the FPSO aned 67m in the vicinity of the CALM buoy.

Pilotage is compulsory.Berthing and unberthing may be done 24 hours, at the pilots discretion. Tankers should proceed to about 5 miles N of the FPSO and await instructions from the pilot.

Consult Pub. 160, Sailing Directions (Planning Guide) South Atlantic Ocean and Indian Ocean for ETA instructions.

An anchorage area, with a depth of 35m , lies about 4 miles E of the terminal, as best seen on the chart.

3.48 The **Rio Etembue** (1˚17'N., 9˚26'E.) flows into the sea 7 miles SW of Punta Ilende. Several off-lying reefs front the bight, which lies between Punta Ilende and the river mouth. The town of Etembue stands on the N bank of the river entrance. Punta Uloba, a headland, is located 1.7 miles WSW of the mouth of the Rio Etembue. Mumunein Bank, a rocky shoal area, lies 2 miles NW of this point and has a least depth of 1.2m. The village of Egombe-Egombe stands 1.5 miles SSW of Punta Uloba.

Several shoal patches lie up to 2 miles off this part of the coast, but the whole of this area is inadequately surveyed.

Between Punta Uloba and Cabo San Juan, 6.7 miles SSW, the coast is fringed with reefs and numerous rocks, awash, lie up to 0.7 mile offshore. Islote Ebumya, a small islet, lies on a reef, 1.5 miles SW of Punta Uloba. Roca Mumunein, with a depth of 1.5m, lies about 1.3 miles WSW of this islet.

3.49 Cabo San Juan (1˚10'N., 9˚20'E.) is covered with trees and appears as three distinct heads when seen from the N. Its base is rocky and the sea breaks violently for up to 0.2 mile offshore. A light is shown from a framework tower, 18m high, standing on the cape.

A large white mission building stands 2 miles E of the cape and is conspicuous from seaward. The Rio Nano enters the sea between the cape and the mission building. Several chimneys stand near the river mouth and a stranded wreck lies close off the entrance. A detached shoal, with a depth of 18.9m, lies about 4.8 miles W of Cabo San Juan.

Anchorage is available, in a depth of 11m, about 2.4 miles NNW of Cabo San Juan.

Caution.—The shores in the vicinity of the cape are very low and the large trees often have the appearance of hillocks when approaching from the W. In addition, the trunks of the trees assume a grayish tint and appear elongated. This distortion, which is caused by a strong mirage effect, gives the coast the appearance of being formed of cliffs intersected by broad fissures or ravines. This illusion occurs frequently, but it is dispelled when vessels close the land.

The tidal currents near Cabo San Juan are complicated. The current setting NNE along the coast is influenced by the tidal currents running in and out of Bahia de Corisco.

Bahia de Corisco

3.50 Bahia de Corisco (Corisco Bay) (0˚54'N., 9˚16'E.) is entered between Cabo San Juan and Cap Esterias, 33 miles S. The name Corisco, derived from the Portuguese, was conferred upon this bay because of the frequent thunderstorms which are experienced in this locality. The E shore of the bay is known as Costa de Los Mosquitos.

Punta Corona (1˚06'N., 9˚23'E.) is located 5 miles SSE of Cabo San Juan. The intervening coast is composed of two shallow indentations separated by Punta Negra. The NW indentation is fringed with rocks which also extend up to 0.3 mile offshore in the vicinity of Punta Negra. The S indentation is fringed by a sandy beach.

Piedra Ugoti and Piedra Biguna, both dangerous rocks, lie 1.1 miles W and 0.6 mile SE, respectively, of Punta Corona. Banco Cakulle, with a least depth of 3m, lies 1 mile SW of Punta Corona and a detached shoal, with a depth of 8.2m, lies 0.8 mile WSW of it.

Banco Lauria lies centered 7 miles WSW of Punta Corona. It consists of a stony patch and has a least depth of 3m.

Punta Mosquitos is located 1.5 miles ESE of Punta Corona and surmounted by several detached clumps of trees. This point, along with the bay lying W of it, is fringed by numerous rocks. Good anchorage is available about 0.5 mile S of the point. The village of Calatrava is situated in the vicinity of this point.

Between Punta Mosquitos and Punta Yeke, 11.5 miles ESE, the coast forms a shallow bay. A shelf, with depths of less than 5m, extends in places up to 4.5 miles seaward from the shore of this bay.

Punta Dambe, Punta Bitimbe, Punta Belekeke, and Punta Betika are located 1.7, 2.7, 4, and 5.7 miles ENE, respectively, of Punta Mosquitos. The Rio Malancha flows into the bay close W of Punta Belekeke and the Rio Odingue flows into the bay close E of Punta Betika.

Punta Eboko is located 1.7 miles E of Punta Betika. From this point, the coast trends 7 miles SSE to Punta Yeke; three small rivers discharge into the bay along this stretch. Several villages stand along the shore. The main village of Efule is situated 3.7 miles NW of Punta Yeke.

Caution.—Transiting the coast between Cabo San Juan and Punta Mosquitos is very dangerous and care should be taken, as there are no conspicuous landmarks and the seas are high during the dry season (June to August).

Due to the possibility of undiscovered dangers lying in the approaches to Bahia de Corisco, vessels navigating in this vicinity are advised to proceed into the bay from the N. They should exercise great care and keep at least 11 miles offshore until turning to head for the entrance.

3.51 Isla de Corisco (Isla de Mandyi) (0˚56'N., 9˚19'E.) lies 14.5 miles S of Cabo San Juan. It is administered from Puerto Iradier and belongs to Equatorial Guinea. A light is shown from a tower, 3m high, standing on the N extremity of the island.

Isla de Corisco is moderately high and has a diversified scenery, on a diminutive scale, consisting of hills, forests, prairies, and lakes. The climate of the island is considered unhealthy, but it is healthier than that of the neighboring coast. Gobe, the principal village, is situated near the center of the S coast.

A rocky patch, awash, lies 1.5 miles NNE of Punta Italo, the NE extremity of the island. It is located on Banco Corisco, which extends up to 3.5 miles NNE from Punta Italo and has depths of less than 9m. Banco Nengueamegue, which dries in places, extends up to 2.3 miles E from Punta Hoco (Punta Yoko), the SE extremity of the island. A small islet lies on this bank.

Punta Uguni (Punta Ugoni), the SW extremity of the island, is rocky and bare. The trees standing along the S coast of the island are thinly scattered as compared with those on the N and E coasts.

Islote Leva, which is uninhabited, lies on a shoal area, 1 mile WSW of Punta Lembue, the S extremity of Isla de Corisco. This islet is of moderate height, covered with trees, and surrounded by breakers, especially on its N and E sides. The shoals, which surrounds Isla de Corisco, extend up to 0.5 mile W and 2 miles S of the islet.

The W coast of Isla de Corisco is rocky; the rocks, especially on their S sides, are covered with patches of white which are prominent from a distance. The mirage effect of the trees lining the coast is similar to that in the vicinity of Cabo San Juan.

Punta Gueliba (Punta Cucliva) is the NW extremity of the island. The coastal bank, with a least depth of 3m, extends up to 1.3 miles NW from this point. A detached shoal, with a least depth of 7.9m, was reported (1959) to lie with its SW end about 3.1 miles NNW of the point. Another detached shoal, with a least depth of 8m, was reported (1962) to lie 1.7 miles NNW of the point.

Caution.—Vessels should not depend entirely on the chart in this vicinity, as the banks and shoals may shift from time to time.

In order to clear the banks extending from the island, vessels are advised to stay at least 2.5 miles from the N and W coasts of Isla de Corisco or in depths of more than 12m. In addition, vessels are advised to stay at least 4 miles from the NE side of the island or in depths of more than 22m.

The passages lying S of the island should only be used with local knowledge.

3.52 Banco Bane (Banco Mbane) (0˚46'N., 9˚21'E.) lies at the S end of the coastal bank which has depths of less than 5m and extends up to about 10 miles S from Isla de Corisco.

Banco Laval, a dangerous drying bank with several rocks, lies about 4.5 miles S of the SW extremity of the island. A stranded wreck lies 2 miles S of this bank.

Islote Conga, a rock, lies almost at the center of Banco Bane, with another above-water rock close SW of it. Islota Bane (Islote Mbane) is located 1 mile NE of Islote Conga. This islet, although low, is conspicuous, as it is covered with high trees.

Bancos del Este, an area of drying sands, extends nearly 2.8 miles ENE from Islota Bane. Islote Cocotier, a rock, lies on a small drying patch, about 2 miles E of Islota Bane. A lighted buoy is moored about 2.5 miles E of this rock.

Although Banco Bane lies about 8 miles from the S shore of Bahia de Corisco, the only available passage leads NE along the SE side of this bank. A least depth of 6.5m lies in this passage near the time of HW, but local knowledge is essential.

Tides—Currents.—Between the banks which encumber Bahia de Corisco, the currents often attain rates of 1 to 2 knots; their directions vary in accordance with the state of the tides. To seaward of Isla de Corisco, the current generally sets in a NNE direction at a rate of less than 1 knot. Within the bay, the tidal currents generally flow E on the flood and W on the ebb. In the S part of the bay, the current setting W sometimes attains a rate of more than 3 knots during the rainy season although, in the dry season, this current normally does not attain a rate of more than 2 knots.

Tidal currents in the bay can be greatly affected by the outgoing river currents.

3.53 Islas Elobey (1˚00'N., 9˚30'E.) lies 11 miles ENE of Isla de Corisco, on the S side of the approach to the Rio Muni. It consists of a group of islands, islets, rocks, and shoal patches. Isla Elobey Grande and Isla Elobey Chico are the principal islands.

Bancos de Elobey, with depths of less than 5m, extend up to about 4 miles WNW from the NW extremity of the group. Several detached shoals, with depths of 5 to 7m, lie up to about 6.5 miles W of the group.

Isla Elobey Grande is wooded. Islote Belobi, a small islet, lies close off Punta Belobi, the N extremity of Isla Elobey Grande. The coast is formed of small and steep cliffs, 10 to 12m high. Bancos de Bene, with several rocks awash, lies 1 mile E of this island.

Isla Elobey Chico, lying 1 mile NE of Isla Elobey Grande, is completely flat. This island has many coconut palms and fruit trees.

Anchorage.—Between Isla de Corisco and Islas Elobey, anchorage can be found, in depths of 16 to 22m, at a moderate distance from either.

Good anchorage is available, in a depth of 8m, mud, about 1.5 miles NE of Punta Hoco, the SE extremity of Isla de Corisco. This roadstead is sheltered from SW winds and the holding ground is so tenacious that tornadoes from the E need not be feared. Although the water is usually quite smooth, without any surf on the beach, a swell occasionally sets in without any apparent cause and rollers break on all sides of the island.

Anchorage may be obtained S of Banco Nengueamegue. At LW, the drying portions of this bank afford a guide. Anchorage, with fair shelter, is also available, in depths of 7m to 8m, mud, inside of Bancos de Elobey, about 1.2 miles NE of Isla Elobey Chico.

3.54 The **Rio Muni** (1˚02'N., 9˚35'E.) is approached between the coastal bank extending off the N shore of Bahia de Corisco and Bancos de Elobey. It enters the bay between Punta Yeke and Pointe Coco Beach, 1.4 miles SSW. Both of these entrance points are low, wooded, and fronted by rocks. A stranded wreck is reported to lie close off Pointe Coco Beach.

The river is navigable as far as Isla Ngande, about 9 miles above the entrance, and forms the boundary between Equatorial Guinea and Gabon.

The least depth in the approach channel is 6.2m. Pilotage is not compulsory, but pilots are available. A lighted buoy is moored about 5 miles NW of Isla Elobey Chico.

3.55 Cogo (Puerto Iradier) (Kogo) (1˚05'N., 9˚42'E.), lying 7.5 miles NE of the river entrance, is situated on the N bank of the river. It is fronted by a wharf which is used by barges. A prominent hospital surmounts the summit of the hill on which the town is built. Islote Ivelo lies off the E entrance of the Rio Congue, close SW of the town.

The roadstead, where cargo is worked, lies close SW of Islote Ivelo. It has depths of up to 11m and can accommodate vessels of up to 9,000 tons and 7.9m draft at HW. A directional light indicates the channel leading to the anchorage. The tides rise about 2.5m at springs and 2m at neaps.

Anchorage is also available, in depths of 9 to 18m, near a timber loading place at the estuary of the river. Local knowledge is advised due to strong tidal currents in some places.

The tributaries of the Rio Muni above Cogo are navigable only by small craft with local knowledge.

Directions.—A recommended approach route, which may best be seen on the chart, leads SE between Cabo San Juan and Banco Lauria. It then leads E and ESE to the river mouth.

Caution.—The buoys marking the approach channel are not to be depended upon.

The banks and shoals lying in the approaches to the river mouth are subject to frequent changes.

3.56 Pointe Ndombo (0˚57'N., 9˚34'E.) is located 4.5 miles SSW of Pointe Coco Beach. The village of Ndombo is situated near the point and is visible from seaward. A light is shown from a tower, 8m high, standing on the point. Small vessels can anchor off the village, in a depth of 3m, good holding ground, about 0.5 mile offshore.

The mouth of the Crique Massotie lies at the E side of the entrance to Baie de Mondah, 15 miles SSE of Pointe Ndombo. The coast between is wooded and intersected by the mouths of numerous small streams. It is also fronted by shoal water, with depths of less than 5m, which extends up to 3.5 miles seaward in some places. Recif Buyumba, a drying reef on which the sea breaks, extends about 1.5 miles SW from a point on the coast, 6.5 miles S of Pointe Ndombo. Another small patch of reef lies 1.4 miles offshore, about 2.8 miles SSE of Recif Buyumba. This patch is marked by a beacon; the sea breaks on it.

The S summit of Monts N'Keba, 209m high, rises about 7 miles E of Recif Buyumba and is surmounted by a conspicuous round tree.

3.57 Pointe Acanda (0˚40'N., 9˚30'E.), located 7 miles WSW of the mouth of Crique Massotie, is the W entrance point of Baie de Mondah. The S shore of Bahia de Corisco trends 11 miles in a WSW direction from this point to Cap Esterias.

Pointe Moka is located 2 miles WSW of Pointe Acanda and the Riviere Moka, which connects with Crique N'Tsini, flows into the sea close W of it. Pointe Boulokouhoue, a salient rocky point, is located 3.5 miles W of Pointe Moka. The shore extending between Point Moka and Cap Esterias is shallow and foul.

An extensive shoal area, with depths of less than 5m, fronts the S shore of Bahia de Corisco. It extends up to about 2.5 miles N from Cap Esterias, up to about 7.3 miles N from Pointe Boulokouhoue, and up to about 4 miles N from Pointe Acanda. Banc Acanda, the SE part of this shoal area, is marked by a small, white beacon tower. Banc de l'Ouest lies close N of Banc Acanda.

3.58 Baie de Mondah (0˚35'N., 9˚36'E.) occupies the SE corner of Bahia de Corisco, but navigation within it is rendered difficult by numerous banks and rocks. In addition, several shoals and mud banks extend from the shores of the bay and a drying bank of soft mud lies at the head. Two long, narrow spits extend N and NW from this drying bank and divide the bay into three narrow channels. It is reported that vessels, with local knowledge, can enter the bay with a maximum draft of 6m at springs and 5m at neaps.

Pointe Nombo is located on the E shore of the bay, 4.2 miles S of the mouth of Crique Massotie. Banc Marabout, a narrow bank with a least depth of 3m, lies centered about 4 miles NW of the mouth of Crique Massotie. Several rivers flow into the head of Baie de Mondah.

It was reported (1979) that a depth of 4m lies on the bar at the S end of Banc Marabout.

The main channel leading into the bay passes between Banc Marabout and Banc de l'Ouest. Another channel leads E of Banc Marabout, but is impracticable. The recommended route leading into the bay, which is marked by buoys, may best be seen on the chart.

Anchorage is available, in a depth of 5.5m, at the E side of the channel, 0.7 mile SW of Pointe Nombo. Anchorage is also available, in a depth of 10m, off Pointe Kendje, which is located 6 miles S of Pointe Nombo. During the dry season (November to April), the currents at this roadstead attain rates of 3.5 to 4 knots at springs.

Bahia de Corisco to the Estuaire du Gabon

3.59 Cap Esterias (0˚37'N., 9˚20'E.) is low, rocky, and not very prominent from seaward. The land rising 2 miles SW of the cape is usually sighted first. A rocky shelf, on which the sea breaks heavily, extends up to about 0.5 mile N from the cape. A light is shown from a pylon tower, 18m high, standing on the cape.

At night, winds from seaward make anchorage off the cape undesirable. Seaward of the cape, the current generally sets N and attains a rate of up to 2 knots. However, it is influenced by the tides. At springs, the tidal currents are sometimes strong enough to cause a weak resultant flow to the S for up to 2 hours. Rates of up to 3 knots have occasionally been observed.

Pointe Megombie (0˚35'N., 9˚18'E.), located 2 miles SW of Cap Esterias, is wooded and comparatively high. A mission station is situated at Averoma, close N of the point, and the village of Yocogo, with two conspicuous houses, stands 0.5 mile S of the point.

Between this point and Cap Santa Clara, 5.5 miles S, the coast appears as an unbroken line of level trees. It is formed by a succession of cliffs, about 20m high and surmounted by trees, through which flow numerous streams during and immediately following the rainy season (November to July). A sandy beach fronts the foot of these cliffs. During the dry season, this beach is continuous and closes the mouths of the streams.

Pointe Mombaliquito (0˚31'N., 9˚18'E.), located 1 mile NW of Cap Santa Clara, is a slight projection which is not easily distinguished. Pointe Ouquouea, located 0.5 mile SE of the point, is prominent and easily identified as it is very high and covered with tall trees. The village of Maleca, surrounded by plantations, is situated N of Pointe Ouquouea.

A rocky ledge, with numerous below-water rocks and depths of less than 5m, extends up to about 0.5 mile W and 1.5 miles S from Pointe Mombaliquito. During bad weather there are heavy breakers on this ledge.

The Estuaire du Gabon

3.60 The **Estuaire du Gabon** (Riviere Gabon) (0˚18'N., 9˚26'E.), the native name for which is M'Pongo, is formed by several tributaries which rise in the mountains in the SE corner of Equatorial Guinea. It is accessible to deep-draft vessels and affords anchorage, with good shelter, to a large number of vessels. However, numerous and extensive shoals obstruct the entrance of the estuary and make navigation somewhat difficult.

The estuary is entered between Cap Santa Clara and Pointe Pongara, 9 miles SSE. Its banks are covered with rich vegetation and intersected by the mouths of numerous creeks. The general direction of the estuary, from its mouth upstream, is SE for about 16 miles and then ESE for about 19 miles to Pointe Pungue, a promontory located at the head. This promontory separates the mouth of the Riviere Ramboe from that of the Riviere Komo, the two large tributaries of the Estuaire du Gabon.

Cap Santa Clara (0˚30'N., 9˚19'E.), the N entrance point, is prominent and surmounted by a conical beacon, 5m high. A line of breakers fringes the cape and lies about 0.5 mile offshore in quiet weather; during bad weather, this line of breakers lies about 1 mile from the coast.

An extensive shoal area, with depths of less than 9m, projects SSE from a point on the coast located close E of Cap Santa Clara. This shoal area extends to within 2.7 miles of Pointe Pongara and may best be seen on the chart.

Pointe Pongara (0˚21'N., 9˚21'E.), the S entrance point, is the N extremity of a low peninsula which is covered by tufts of grass. This peninsula is composed of alluvial deposits which the action of the sea has covered with sand. The ruins of a beacon stand on the point.

3.61 Pointe Ngombe (Pointe Gombe) (0˚18'N., 9˚19'E.), located 4.5 miles SW of Pointe Pongara, is 45m high. It has some reddish patches and distinctive trees on the landward side. A light is shown from a tower, 12m high, standing on the point.

The E side of the estuary, extending 20 miles SE from Cap Santa Clara, is high and dominated by chalky hills, but most of the various summits are not easy to distinguish. Mont Bouet, 125m high, rises about 2.5 miles inland, 9.5 miles SE of Cap Santa Clara. This hill is wooded and it is the easiest to identify in the area. Mont Baudin rises 1.7 miles SE of Mont Bouet and has numerous trees with a ragged appearance. L'Ombrelle,

another hill, rises close SE of Mont Baudin. It is 117m high and has an umbrella-shaped tree standing on the summit.

Several corrugated iron buildings standing 2 miles NW of Libreville are prominent from offshore.

Baie d'Acquengo lies close E of Cap Santa Clara; its W side is fringed with rocks. The Riviere Otande flows into the head of this bay. Between the mouth of this river and Pointe des Normands, 7 miles SE, the coast is low and bordered by large trees. The shore consists of a sandy beach on which the sea breaks heavily in bad weather. Several radio masts stand 1.5 miles SSE of Pointe des Normands, with a conspicuous water tower situated 0.5 mile ENE of them. Another radio mast stands 5.5 miles ESE of the point.

Pointe Pandinou, located 3 miles NW of Pointe des Normands, is fronted by a rocky spit and by Banc de l'Adour which has depths of less than 3m and extends up to 1.4 miles seaward. An airfield is situated 1 mile SSE of this point.

Banc de la Themis (0˚27'N., 9˚15'E.), an extensive shoal area, lies in the center of the seaward approach to the estuary, 5 miles SW of Cap Santa Clara, and has a least depth of 5.8m.

Several shallow wrecks lie centered about 5.5 miles NW of Pointe Pongara, near the NW end of Banc da la Mouche.

Winds—Weather.—Strong winds are rare in the estuary, except during the tornado season (about October to May). The rainy season lasts from the middle of November to the middle of July. There is no swell in the estuary, but the sea may become extremely choppy during high winds.

Tides—Currents.—The tidal currents in Estuaire du Gabon are strong and are influenced by the outgoing river current. The flood tidal current sets N outside the estuary. When entering, this current alters its direction clockwise, until on approaching Bancs du Sud-Est, when it sets SE. It is strong in the vicinity of Cap Santa Clara and it sets NE near Banc du Caraibe, while in Passe de la Penelope it sets toward the E shoals. The flood tidal current attains a rate of 1.5 to 2 knots at springs.

The ebb tidal current sets through the approach channel, except in Passe de la Penelope where it sets toward the W shoals. Outside the estuary, this current sets S. Within the estuary, the ebb tidal current often continues for 10 hours and frequently attains a rate of 4 to 5 knots. At such times, the strength and duration of the flood tidal current are correspondingly reduced.

Freshets occur in the Estuaire du Gabon, principally at the beginning of the rainy season (November). However, they are occasionally experienced at other times and are sometimes sufficiently violent to interrupt river traffic for several days. During these floods, a foul smell pervades the whole estuary.

Rollers occur during the dry season, at which times the outer shoals break and a heavy swell sets into the estuary. The shore in the vicinity of Libreville is then rendered difficult to approach.

Pilotage.—It is reported that pilots are not available for entering the estuary, but local fishermen, who are acquainted with the approach channel and the shoal banks, may be obtained from the villages situated in the vicinity of Cap Esterias.

Anchorage.—During the dry season (June to September), vessels may anchor, in a depth of 12m, mud, off the S shore of the estuary between Pointe Pongara and Crique Rogolay, 3 miles SSE. The holding ground is excellent, but this roadstead is dangerous during the tornado season. Crique Rogolay is infested with crocodiles.

Directions.—Passe de la Penelope (0˚24'N., 9˚20'E.) is the main channel leading into Estuaire du Gabon. It is entered close SW of Banc da la Themis and has a least depth of 11m. This channel passes between several extensive banks and shoal areas and is marked by buoys. An outer lighted buoy, moored about 7.2 miles SW of Cap Santa Clara, marks the seaward entrance of this channel. The recommended route through the channel is indicated on the chart.

When approaching the estuary from seaward, the soundings give a good indication of the distance from the land, as depths of 180m run in a line which lies parallel to and about 25 miles from the coast. The depths increase rapidly to seaward of this line, but decrease gradually and regularly toward the land. It should also be noted that the land to the N of the estuary is high when compared with that to the S, which is very low.

On opening the mouth of the estuary, the hills and spires in the vicinity of Libreville may be easily identified. During fog or at night, vessels are advised to anchor in a suitable depth outside the estuary if the channel buoys or landmarks are not visible.

Caution.—The banks and shoals in the approaches are continuously acted upon by the strong currents. They may shift from time to time and too much dependence should not be placed on the chart. Banc de la Themis was reported (1986) to be extending further to the S than charted.

Buoys marking the approach channel leading into the Estuaire du Gabon are frequently reported to be out of their assigned positions and cannot be depended upon.

The lights marking the estuary are unreliable, especially the one shown from Pointe Ngombe, which is frequently reported to be unlit.

It was reported that Pointe Pongara is being eroded by the action of the currents and is liable to be of a different shape from that shown on the charts.

3.62 Libreville (0˚23'N., 9˚27'E.) (World Port Index No. 46430), the capital of Gabon, stands along the edge of a small hill, 2.5 miles SSE of Pointe des Normands. The shore is fringed with reefs and cargo is worked by barges from vessels at anchor.

A church, with a spire, stands in the town. When the sun shines on this spire, it appears as a white obelisk and can be seen from a considerable distance.

A wharf, protected by a detached breakwater, fronts the town and is used by small coasters, local ferries, barges, yachts, and fishing vessels. Vessels may anchor, in depths of 8 to 9m, mud and clay with good holding ground, about 1 mile SW of the wharf.

It was reported (1990) that all cargo is being worked at Port Owendo.

Caution.—A disused submarine pipeline extends about 0.9 mile WSW from a point on the shore located close SE of the wharf. Several obstructions lie on the seabed in the vicinity of the outer end of this pipeline.

A restricted area, within which anchoring and fishing are prohibited, lies close NW of the wharf. It extends up to 3 miles seaward from the shore and may best be seen on the chart.

3.63 Port Owendo (Port Ovendo) (0˚17'N., 9˚30'E.) lies on the SW side of Pointe Owendo, 6 miles SE of the S end of Libreville.

Tides—Currents.—The tides rise about 2.4m at springs and 1.9m at neaps.

Depths—Limitations.—The port facilities include a main quay, 450m long, which is situated on the SW side of Pointe Owendo. It provides three berths, with depths of 9.5 to 11m alongside. Vessels of up to 220m in length and 9m draft can be accommodated. It was reported (1995) that Berth No. 1 had a depth of 11m alongside, Berth No. 2 had a depth of only 4.5m alongside, and Berth No. 3 had a depth of only 5.5m.

A cement pier, 60m long, is situated on the E side of the point. It can handle vessels of up to 130m in length and 5.8m draft.

There is also a bitumen berth, consisting of head and stern mooring buoys, lying off the SE extremity of the point. It can handle vessels of up to 100m in length and 5.8m draft.

A manganese ore pier, with a dolphin berth at the head, extends 0.5 mile SSW from the shore, close NW of the main quay. It has a depth of 12m alongside and can handle vessels of up to 10.4m draft, depending upon the tide.

Vessels are usually berthed within the port at slack water, day or night.

Aspect.—Pointe Owendo, 24m high, is the S extremity of a wedge-shaped projection on which stand Montagnes de Conicoue. These latter hills attain heights of 50 to 80m. A light is shown from a square tower, 10m high, standing on the point.

Several rivers enter the estuary ESE of Pointe Owendo. Most of these are navigable only by small craft with local knowledge.

Pilotage.—Pilotage is compulsory for vessels over 500 grt and is available 24 hours. Vessels should send an ETA and request for pilotage, through their agent, 24 hours in advance. A confirmation message should be sent 12 hours in advance. Pilots can be contacted on VHF channels 12 and 16. All vessels must call the pilot on VHF channel 12 upon arrival at Themis Lighted Buoy and maintain a continuous listening watch for further instructions from the pilot. The pilot boards in the vicinity of Pilot Lighted Buoy. Information concerning the buoys marking the approach channel is given by VHF.

Anchorage.—Anchorage is available, in depths of 9 to 10m, mud, with good holding ground, about 1.1 miles SW of the head of the manganese pier. Vessels may also anchor, in depths of 6 to 8m, sand and mud, with good holding ground, between 0.6 and 2 miles SE of Pointe Owendo.

Caution.—The local authorities or agent should be contacted in advance, as silting may often reduce the depths alongside the berths.

The river tidal currents run strongly at times and can attain rates of up to 5 knots after heavy rains.

The Estuaire du Gabon to Baie du Cap Lopez

3.64 Between Pointe Ngombe and Cap Lopez, 67 miles SW, the coast forms a large bight the S part of which is known as Baie du Cap Lopez. The coast in the N part of this bight, between Pointe Ngombe and the equator, is moderately high and level. It is fringed by a narrow, sandy beach which is intersected in several places by creeks.

Near the Equator, a chain of hills and dunes, about 31m high, rises and extends S, parallel to the coast. A white sandy hill, covered with scrub, stands about 23 miles S of Pointe Ngombe. It is conspicuous from seaward and appears, over the trees which line the coast, with a reddish tint.

Pointe Ognone (Pointe Nyonie) (0˚03'S., 9˚20'E.) is located 21 miles S of Pointe Ngombe; a small river flows into the bight close N of it. The position of this point may be determined by a sudden break in the trees. The mouth of the river occasionally shifts by up to 0.5 mile in a short amount of time. A small airfield is situated close N of the point.

Pointe Ekoueta Niliani (0˚13'S., 9˚18'E.) is located 6.5 miles S of Pointe Ognone. Les Mamelles, two conspicuous hills, rise to heights of 160m and 108m, about 3 miles SE of this point. A conspicuous building is reported (1990) to stand about 0.5 mile NE of the point.

Batanga (0˚21'S., 9˚18'E.) lies 8.5 miles S of Pointe Ekoueta Niliani and is fronted by a small pier. A small airfield is situated in the vicinity of this village.

Konzi Oil Field (0˚16'S., 9˚13'E.), consisting of two platforms, lies centered 7 miles WNW of Batanga.

Caution.—A submarine pipeline, which may best be seen on the chart, extends WNW from Batanga to Konzi Oil Field and then SW to Cap Lopez. A prohibited area, the limits of which are shown on the chart, lies in the vicinity of the oil field. An area, within which anchoring and fishing are prohibited, lies in the vicinity of the NE part of the submarine pipeline and may best be seen on the chart.

3.65 Aloumbe (0˚26'S., 9˚17'E.), marked by a beacon, lies 13 miles S of Pointe Ekoueta Niliani and is a timber-loading site. Rafts of logs, consisting of 50 to 70 logs each, are towed to a roadstead anchorage by tugs.

Ilots Fanaes (Roche Fanaes), consisting of several small above-water rocks, lies near the seaward end of a shallow shoal which extends up to about 1.3 miles offshore in the vicinity of Aloumbe.

Three large grassy plains lie N of the town of Sangatanga, which stands 3.5 miles SSW of Aloumbe. These plains are separated by dense woods and are conspicuous from up to 10 miles offshore. Gongoue, lying 8.5 miles SSW of Aloumbe, is another timber-loading site.

Baie de Nazare is entered between Pointe Weze, located 17.5 miles SW of Aloumbe, and Pointe Apoumanda, 5.7 miles W. It is completely obstructed by shallow banks which have been formed by the mud carried down by several rivers.

The current off this part of the coast generally sets NNE and attains a rate of not more than 0.5 knot, except after a series of fresh SW winds.

Caution.—Oil and gas exploration is being carried out along this stretch of coast and offshore drilling structures, with associated objects, are likely to be encountered in the waters lying S of the Equator and E of 9˚E. Vessels should exercise care when navigating off this coast, as many of these structures and objects frequently move and are not charted.

Baie du Cap Lopez

3.66 Baie du Cap Lopez (0˚38'S., 8˚49'E.) lies between Pointe Apoumanda, the W entrance of Baie de Nazare, and

Cap Lopez, 18 miles W. The shores of the bay are very low and covered with mangroves. The Riviere d'Oranga empties into the head of the bay while the Riviere Yombe and the Riviere Kondjo empty into the SE part. The S and E parts of the bay are obstructed by extensive shoals.

Cap Lopez Oil Terminal lies on the N side of Baie de Prince, at the SE side of the cape. The harbor of Port-Gentil extends SE from Pointe Clairette and fronts the E side of Ile Lopez.

Ile Aparia lies on the W side of the entrance to the Riviere Kondjo, at the SE side of the bay. This island may be easily identified as it is covered with coconut trees and is slightly higher than the nearby coast.

3.67 Cap Lopez (0˚37'S., 8˚43'E.), which forms the S limit of the Bight of Biafra, is the N extremity of Ile Lopez. This latter island is low, wooded, and formed by the two mouths of the Ogooue River. The cape consists of a low plain, but is easy to identify because of its salient position. From the N, the cape itself appears as an island, with large mangroves towering above the scrubby vegetation. Capitaines Light is shown from a framework tower standing on the E side of the cape. Several prominent chimneys are situated close W of the light.

It has been observed that from 7 miles N to 4 miles S of the cape, the edge of the grayish-green water flowing from the Ogooue River appears in marked contrast to the color of the ocean. This edge is also marked by tide rips.

Banc du Loiret is the former submerged extremity of Cap Lopez. It has a least depth of 3.1m and extends up to about 0.9 mile NW from the cape.

Banc du Prince, with depths of less than 10m, extends up to about 4.7 miles NE from Pointe du Prince, which is located 3 miles SE of the cape. This bank has a least depth of 2.6m, is steep-to, and is marked by a lighted buoy at the seaward end.

3.68 Pointe Clairette (0˚41'S., 8˚47'E.) is located 5 miles SE of the cape. A refinery, with a prominent flare, and a conspicuous group of oil tanks are situated in the vicinity of this point.

Prominent water towers stand 1.5 miles SSW and 3.2 miles S of the point. An aeronautical radiobeacon is situated 1.4 miles SW of the point. A large and prominent factory building stands 1 mile S of the point.

Banc de l'Alcyon, with depths of less than 5m, extends up to about 1.3 miles ENE from a point on the shore, 1 mile S of Pointe Clairette. Banc du Talisman, with depths of less than 5m, extends up to about 1 mile NE from a point on the shore close S of Banc de l'Alcyon.

Banc Rousselot, with depths of less than 5m, extends up to about 1 mile E from Pointe Akosso, located 3 miles SSE of Pointe Clairette.

A prominent television tower, 123m high, stands 0.9 mile SSW of Pointe Akosso.

Tides—Currents.—The tides rise about 2m at springs and 1.6m at neaps.

In the vicinity of Cap Lopez, an eddy current has been observed to set toward Banc du Loiret or into Baie du Prince. The ebb tidal current in the bay generally sets NNW at a distance of up to 1 mile from the shore. It usually attains a rate of less than l knot, but may reach 3 knots during the rainy season.

Caution.—Strong eddies and discolored water may be encountered in the vicinity of Banc de Loiret. Vessels are advised to give Cap Lopez and this bank a wide berth.

Oil and gas exploration and production are being carried out within the bay and in the waters lying off the W coast of Ile Lopez. Vessels should exercise care when navigating in the vicinity of the cape as numerous platforms, submarine pipelines, and associated structures are situated in this area.

Several wrecks, some of which are dangerous, lie in the approaches to the cape and may best be seen on the chart.

3.69 Cap Lopez Terminal (ELF Gabon Oil Terminal) (0˚38'S., 8˚43'E.) (World Port Index No. 46445) lies in Baie du Prince, on the SE side of Cape Lopez. An abandoned whaling station is situated at the head of the bay and several oil tanks stand close N of it.

Depths—Limitations.—The terminal consists of a loading platform with dolphins which is connected to the shore by an L-shaped pier, 340m long. The berth has a depth of 25m alongside and can accommodate vessels of between 35,000 and 250,000 dwt, between 215 and 340m in length, and up to 20.5m draft.

Pilotage.—Pilotage is compulsory and is available during daylight hours only. Pilots can be contacted by VHF and board about 1.5 miles ENE of the head of the pier. Vessels should send an ETA 72 hours, 48 hours, and 24 hours in advance via Libreville.

Regulations.—A restricted area, which may best be seen on the chart, extends up to 0.3 mile seaward from the N shore of Baie du Prince and from the E side of Cape Lopez. Only vessels proceeding to the terminal may enter this area.

Vessels should maintain a listening watch on VHF channel 16 when approaching the terminal. During mooring and loading operations, vessels maintain a listening watch on VHF channel 72.

Anchorage.—Anchorage is available, in depths of 62 to 70m, about 1 mile ENE of the pier.

Caution.—An obstruction was reported (1987) to lie in the vicinity of the oil berth.

A submarine pipeline, which may best be seen on the chart, extends E and NE from within Baie du Prince and connects with the **Konzi Oil Field** (0˚16'S., 9˚13'E.) and Batanga.

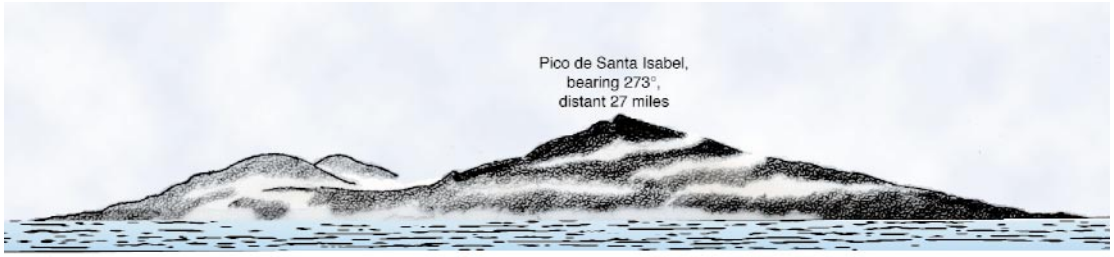
Between February and April, a risk of tornadoes exists.

3.70 Port-Gentil (0˚43'S., 8˚48'E.) extends S from Pointe Clairette. It is sheltered from the E, W, and S, but is open to winds from the N.

Depths—Limitations.—Commercial Quay, the main wharf, fronts the shore, 0.6 mile SSW of Pointe Clairette. It is 375m long and has depths of 9 to 11m alongside, with facilities for ro-ro and container cargo. Vessels of up to 35,000 dwt and 10.5m draft can be accommodated.

A basin, 250m wide, lies at the N end of Commercial Quay. The quay on the S side of this basin is 285m long. It has depths of 6 to 7m alongside and is mainly used by fishing vessels. The N side of the basin is used by barges and small craft associated with the exploration and production of oil and gas.

An oil refinery (SER Terminal) berth lies close SE of Point Clairette and consists of two large dolphins and two mooring



Isla de Bioko (Masie Nguema Biyogo) (Fernando Poo) from E

buoys. It has a depth of 13m and can accommodate tankers of up to 80,000 dwt, 183m in length, and 10.1m draft.

Pilotage.—Pilotage is compulsory. Pilots are provided from the station at Cap Lopez Terminal and generally board about 1.5 miles NE of Pointe Clairette.

Regulations.—A regulated area, which may best be seen on the chart, extends up to 2 miles seaward in the vicinity of Port-Gentil. Only vessels proceeding under pilotage to the harbor facilities may enter this area.

Vessels should request a pilot 12 hours in advance. The initial contact with Port Control should contain the following information:

1. Gross registered tons.
2. Master's name.
3. Last port of call.

After contacting Port Control, vessels should maintain a listening watch on VHF channel 12.

Anchorage.—Anchorage may be obtained, in a depth of 18m, mud, about 0.3 mile SE of Pointe Clairette, but vessels must proceed to this roadstead only under pilotage.

Anchorage may also be obtained, in a depth of 12m, mud, within the bay lying S of Banc du Talisman.

Caution.—Numerous oil platforms and structures are situated in the E part of Baie du Cap Lopez.

Floating logs, up to 1.2m in diameter, may be encountered adrift in the approaches to the harbor.

Vessels should only turn S towards the port when well clear of Banc du Prince.

Several wrecks, some of which are dangerous, lie in the approaches to the port and may best be seen on the chart.

It was reported (1994) that the navigation aids in the vicinity of the port are unreliable.

Islands in the Bight of Biafra

3.71 The islands located in the Bight of Biafra, four in number, lie nearly equidistant from each other along a line extending SW from the head of the bight. The NE and largest island is Isla de Bioko (Masie Nguema Biyogo) (Fernando Poo); next is Ilha do Principe, then Ilha de Sao Tome, and finally Pagalu (Annobon), the outer and SW island.

These islands and the Cameroun Mountains, on the mainland, are of volcanic origin. All of these features are in line and were probably formed by the same submarine upheaval. The basaltic and ferruginous rocks, of which the islands are composed, and the black sand found along the shores, are all evidences of volcanic activity.

Isla de Bioko (Masie Nguema Biyogo) (Fernando Poo) and Pagalu (Annobon) form a province of Equatorial Guinea.

Ilha do Principe and Ilha de Sao Tome are an independent republic.

Caution.—Magnetic disturbances have been observed in the approaches to the islands lying within the Bight of Biafra.

Isla de Bioko

3.72 Isla de Bioko (Masie Nguema Biyogo) (Fernando Poo) (3˚30'N., 8˚40'E.) is the most important of the four islands lying in the Bight of Biafra. A ridge of mountains traverses nearly the entire length of this island and culminates in the magnificent cone of Pico de Santa Isabel (3˚35'N., 8˚46'E.), the summit of which is 3,008m high and almost constantly enveloped in clouds. It has been considered doubtful whether this volcanic cone can yet be considered extinct, as smoke is occasionally observed issuing from it.

Winds—Weather.—On a clear day, this peak is sometimes visible from the W up to 100 miles seaward. However, the weather is sometimes so thick and hazy that the land cannot be seen. Due to the strong current setting E, vessels may even pass the island without sighting it.

The rainy season lasts from April to October and the dry season lasts from December to February. The prevailing winds are generally from the W. Mosquitoes, tsetse flies, and phalaria flies are prevalent in the cultivated areas of the island up to a height of 600m, but only sand flies and mosquitoes are encountered in the towns and villages.

Tides—Currents.—The currents in the vicinity of Isla de Bioko are variable. The Guinea Current, which sets so continuously toward the Bight of Biafra, impinges upon the shores of Isla de Bioko and the island is therefore, to a certain extent, within its influence. During the winter months, the current generally appears to set N off the W coast, E off the S coast, and S off the E coast of the island. It usually attains a rate of 1 to 2 knots. During the summer, the current generally appears to set N off the W and E coasts and W off the S coast of the island. However, the currents are variable in this locality and cannot be relied on.

The general direction of the current setting along the N coast of the island is E. It is variable, but has been observed to attain

a rate of 1.5 knots. When approaching the island, particularly at night, this current should be given consideration.

Caution.—It was reported (1993) that the lights on Isla de Bioka were unreliable and may be extinguished.

Navigation in the claimed territorial waters, within 12 miles of the island, is also reported (1993) to be inadvisable.

3.73 Punta Europa (3˚47'N., 8˚43'E.), the NW extremity of Isla de Bioko, is a salient point surrounded by numerous tall trees. It is fronted by numerous above-water rocks which lie close offshore. A light is shown from a framework tower standing on the point, but both the light and the structure are obscured by trees on certain bearings. A prominent flare is reported (1990) to be situated close SW of the light.

An airport is situated 2 miles S of Punta Europa and an aeronautical light is occasionally shown in its vicinity.

Caution.—An offshore platform, equipped with a racon, is situated 15.5 miles NW of Punta Europa. A gas pipeline extends SE and S from this platform to a terminal standing close E of Punta Europa. This pipeline is marked, in the vicinity of the shore, by buoys and anchoring near it is extremely dangerous and prohibited.

3.74 Zafiro Terminal (3˚51'N., 8˚07'E.), a Floating Production Storage and Offloading (FPSO) facility, lies about 36 miles WNW of Punta Europa; the terminal is surrounded by a circular restricted area 4.25 miles in radius. Pilotage is compulsory; the pilot boards about 4 miles N of the terminal.

3.75 Punta Europa Marine Terminal (3˚47'N., 8˚43'E.), an oil loading facility, lies close offshore, 0.7 mile ENE of Punta Europa. It consists of four mooring buoys lying in a depth of 38m. Tankers of up to 60,000 dwt and 213m in length can be accommodated.

During the rainy season (April to October), the current usually sets NW at a rate of up to 2.5 knots in the vicinity of the terminal. It is usually weak and variable during the dry season.

Vessels should send an ETA via their agent 72 hours, 48 hours, and 24 hours in advance. Vessels should then contact the terminal on VHF channel 16 when within 20 miles of the terminal; after the initial contact, the terminal will designate the working frequency for further communications.

Pilotage is compulsory. Pilots, acting as mooring masters, usually board about 1.5 miles N of the terminal and remain on board the vessels throughout the loading operations. Vessels berth and unberth during daylight hours only.

No designated anchorage berths exist and due to the presence of the gas pipeline in the vicinity of the berth and reports of shoal water in the bay lying between the terminal and Malabo, vessels are advised to anchor to the N of 3˚47'N and to the E of 8˚44'E. There are depths of 35 to 40m; the bottom consists of mud and sand, good holding ground.

3.76 Malabo (Santa Isabelle) (3˚45'N., 8˚47'E.) (World Port Index No. 46320) is situated on a plateau, 4.5 miles SE of Punta Europa. It is not only the capital of the island, but is also the capital of Equatorial Guinea.

Tides—Currents.—The tides rise about 1.8m at springs and 1.4m at neaps.

Depths—Limitations.—The entrance fairway has depths of 18 to 22m over a width of about 90m.

The old part of the harbor, at the SE side of the bay, has a quay, 274m long, with depths of 8 to 9m alongside and a pier, 27m wide. Vessels usually moor and berth stern-to at this quay.

The new part of the harbor, at the SW side of the bay, has a bulk quay, 305m long, with a depth of 15m alongside.

Vessels of up to 23,000 grt, 176m in length, and 13.7m draft have been handled alongside in the port.

Aspect.—The town is fronted by Bahia de Malabo (Bahia de Santa Isabel) and stands at the top of some cliffs. Several buildings in the town are conspicuous from seaward.

Punta de la Unidad Africana, marked by a light, is the N extremity of a narrow peninsula which extends 0.4 mile NNW from the coast and forms the E side of Bahia de Malabo. A prominent monument, formed by a cross, stands close SE of the point; an obelisk is situated 0.2 mile SE of it.

Punta Cristina, located 0.5 mile SW of Punta de la Unidad Africana, is the N extremity of a bluff peninsula which terminates in vertical cliffs.

Islotes de Enrique consists of several rocks, 12 to 14m high, and lies at the W side of the Bahia de Malabo, close NW of Punta Cristina.

Bahia de Venus lies between Punta Cristina and Punta Pilon, 0.3 mile WSW. The shores of this bay are high, steep, and rocky. A group of large fuel tanks stands 0.5 mile S of Punta Pilon.

Shoal water, best seen on the chart, extends W from Punta de la Unidad Africana and NE from Isoltes de Enrique.

The entrance fairway leading into the harbor is indicated by a lighted range.

Pilotage.—Pilotage is compulsory for vessels over 50 grt. Pilots can be contacted by VHF and generally board about 0.5 mile NW of Punta de la Unidad Africana. It is reported that pilots only berth vessels during daylight; vessels may leave at any time and are not required to use the services of a pilot. Vessels should send an ETA via Douala (TJC).

Caution.—It is reported that the range structures are difficult to distinguish by day against the background and the front one is frequently obscured by vessels at the pier.

The navigation aids in the vicinity of the port were reported (1996) to be unreliable.

3.77 Punta Hermosa (3˚46'N., 8˚54'E.), the NE extremity of the island, is round, sloping, and thickly wooded. A prominent volcanic hill rises about 1 mile S of the point.

Isolete de Horacio lies close offshore, 0.5 mile SE of Punta Hermosa. A light is shown from a tower, 16m high, standing on the N part of this islet.

At night or in thick weather, vessels should use care when passing Punta Hermosa, as the depths give no warning of its proximity and the high land behind the point makes it difficult to judge the distance off.

Punta Caracas (Fronton de Caracas) (3˚25'N., 8˚48'E.) is located 21 miles SSW of Punta Hermosa. A light is shown from a pyramidal tower, 8m high, standing on this point. Islote Leven lies 0.5 mile offshore, about 3 miles NNE of the point. This small islet is of moderate height, but does not stand out clearly.

Bahia de la Concepcion (Bahia de Riaba) is entered 1.5 miles SW of Punta Caracas. This bay, into which several streams flow, is quite exposed to E winds, which may be strong during a tornado. The village of Riaba Concepcion, marked by a light, is situated near the head. Anchorage can be obtained, by vessels with local knowledge, on a very narrow bank which fronts the shore. The recommended anchorage, in a depth of 18m, sand, lies 0.3 mile ENE of the village.

Between Punta Hermosa and Punta Santiago, the S extremity of the island, the E coast of Isla de Bioko is abrupt, rocky, and indented. It consists of a succession of points, generally covered with thick vegetation and fringed by rocks, and small coves fronted by sandy beaches.

The mouth of the Rio Iledyl, an important river, lies 3.5 miles NE of Punta Santiago, but the entrance is not visible from seaward.

Punta Santiago (3˚13'N., 8˚41'E.), the SE extremity of the island, is very high, rocky, and covered with trees. Several conspicuous large rocks, over which the sea breaks, lie at the base of this point. A light is shown from a metal tower, 25m high, standing on the point.

Between Punta Santiago and Punta Oscura, 14.5 miles WNW, the S coast of Isla de Bioko is quite similar to that of the E side of the island, but the land rises more steeply behind the shore.

3.78 Punta Oscura (3˚16'N., 8˚27'E.), the SW extremity of the island, is formed by a high promontory with vertical sides and a level top. It is covered with tall trees and thick vegetation. Several waterfalls are located near the point and are prominent from seaward.

Punta Arjelejos (3˚28'N., 8˚29'E.) is located about 13 miles N of Punta Oscura. Between these points, the coast extends N for about 5 miles and is precipitous with numerous cliffs. It then continues NNE for about 8 miles and is moderately high, covered with vegetation, and fringed by black rocks.

Bahia de San Carlos lies between Punta Arjelejos and Punta Cabras, a rocky and steep-to point located 6.5 miles NE.

Punta Barcelonesa (3˚28'N., 8˚32'E.), located 4 miles E of Punta Arjelejos, is fronted by a rocky spit which extends up to 0.3 mile seaward. The shore between is indented by several small bays which are fringed with black sand. A light is shown from a tower, 16m high, standing on Punta Barcelonesa.

3.79 Luba (3˚30'N., 8˚34'E.) (World Port Index No. 46330), a small port, lies 0.8 mile SE of Punta Barcelonesa and is used for exporting bananas. A jetty, 123m long, provides a berth at the head, 50m long, with a depth of 7.3m alongside. Small vessels of up to 6.7m draft can be handled. Larger vessels work cargo from lighters in the roadstead. This roadstead is sheltered from the predominate winds, but occasional squalls come down from the mountain sides. Vessels can anchor, in a depth of 31m, about 1.7 miles S of Punta Cabras. Several radio masts stand close E of the jetty.

Islotes Loros (3˚33'N., 8˚34'E.) lies about 1.3 miles NNW of Punta Cabras and consists of three islets surrounded by breakers. The area lying between these islets and the coast is foul. A light is shown from a metal tower standing on the westernmost islet.

Punta Achada is located 8 miles NNE of Islotes Loros. Bajo Vazquz de Castro, an extensive shoal, lies about 1.7 miles W of this point and has a least depth of 3.7m.

Rocas Primos (3˚38'N., 8˚34'E.) lies 2 miles offshore, about 3 miles SW of Punta Achada. It consists of three above-water rocks lying on a very narrow and steep-to reef.

Between Punta Achada and Punta Europa, 9 miles NE, the coast is moderately high and covered with vegetation. It consists of several rocky points, which are fringed by shoals, and a number of small, white sandy beaches.

Ilha do Principe

3.80 Ilha do Principe (1˚37'N., 7˚24'E.) lies 116 miles SW of Isla de Bioko. It has an extremely picturesque appearance formed by needle-shaped peaks and leaning mountain masses which rise abruptly from the high land of the interior.

The heavy rainfall and the great fertility of the soil have produced a growth of vegetation so rank as to render the island unhealthy. There are traces of extinct volcanoes in many parts of the island and large areas are covered with volcanic stones.

The N part of the island, although high, is not so grand in appearance as the S part, which consists of a series of steep and rugged mountains, surrounded by several gigantic and fantastically shaped natural obelisks. The whole of this latter mass culminates in **Pico do Principe** (3˚36'N., 7˚24'E.), which is 947m high.

The current in the vicinity of the island is variable, but is reported to usually set N or NE at a rate of 1 to 2 knots.

Caution.—Strong magnetic anomalies have been reported close off Ilha do Principe, especially in the vicinity of Baia de Santo Antonio.

Ilha do Principe from W

3.81 Ilheu Bombom (1˚42'N., 7˚24'E.) forms, in reality, the N extremity of Ilha do Principe. This islet, which is 59m high, is connected to the main island by a sandy spit, on the W side of which lie two small and rocky islets. Ilheu Bombom is densely wooded and steep-to on its seaward side, against which the sea frequently breaks. A light is shown from a tower, 4m high, standing on its summit. A conspicuous radio mast is reported (1995) to be situated 0.5 mile S of the light.

Pedra de Gale, 2.7m high, lies 2 miles NW of Ilheu Bombom and is a small black rock on which the sea always breaks.

Ponta Banana (1˚42'N., 7˚26'E.), located 2.3 miles ESE of Ilheu Bombom, is high, rocky, and steep-to. A low neck lies on the inshore side of this point and it has the appearance of being detached when viewed from a distance to seaward. Between Ilheu Bombom and this point, the coast recedes to form a bay with wooded and rocky shores. Good anchorage can be taken by small vessels, with local knowledge, in a depth of 15m, within this bay.

Ponta dos Mosteiros (1˚41'N., 7˚28'E.), located 1.5 miles ESE of Ponta Banana, is the NE extremity of Ilha do Principe. It consists of moderately high cliffs against which the sea often breaks with violence. A black rock lies close off this point and a spit, with foul ground and several rocks awash, extends up to 0.7 mile ENE from it. Ilheus dos Mosteiros, 20m high, lies close within the seaward end of this spit. Vessels are advised to stay well clear of the outer end of this spit.

Ponta Capitao, formed by a steep-to tongue of land, is located 0.8 mile S of Ponta dos Mosteiros.

3.82 Baia de Santo Antonio (1˚39'N., 7˚27'E.) (World Port Index No. 46375) is entered between Ponta Capitao and Ponta da Garca, 2.5 miles S. The inner part of this bay is not easily distinguished from seaward and the shores are rocky with numerous sandy coves. The town of Santo Antonio stands near the head and is fronted by a small wharf, which is used by small craft. It is situated on a plain, sheltered by wooded hills, and is sometimes inundated by the sea. The houses are built mainly of wood and stand on piles.

Vessels anchor, in depths of 10 to 18m, good holding ground, off the town and work cargo from lighters. The tidal currents are weak, but the principal objection to this bay is that the anchorage is exposed to the prevailing winds, from the E and SE, of the tornado season.

Pilotage is not available.

Ponta de Mina, marked by a light, is located 2 miles NW of Ponta da Garca. This point is prominent and fringed by several rocks, with an ancient fortress standing on its summit.

Ponta da Garca (1˚38'N., 7˚28'E.) is the S entrance point of Baia de Santo Antonio. The coast extends SSW for 5 miles from this point and forms a wide bay with high cliffy shores.

Ponta do Pico Negro (1˚32'N., 7˚24'E.), the S extremity of the island, is formed by a long and narrow tongue of land, with steep cliffs on both sides.

Ilheu Caroco (1˚31'N., 7˚26'E.), lying 1.5 miles SE of Ponta do Pico Negro, is 305m high, rocky, steep, and wooded. It is covered with trees and brushwood. A low rock lying close off the S side of this islet is prominent when seen from E or W. The channel leading between this islet and Ponta do Pico Negro has depths of 18 to 36m, with a bottom of fine black sand. The currents in this channel are variable and caution is required.

Pedras Tinhosas (1˚21'N., 7˚18'E.) consists of two islets which lie 13 and 11.5 miles SW of Ponta do Pico Negro. Tinhosa Grande, the S and larger islet, is 55m high. Tinhosa Pequena, the N islet, is 64m high. Both islets are covered with brushwood and are marked by white patches of guano.

Ponta do Grosso (1˚33'N., 7˚21'E.), the SW extremity of the island, is a rocky and steep-to headland located 4 miles WNW of Ponta do Pico Negro. It is dominated by a mountain, 622m high, which appears to have two peaks when seen from the SW. Several rocky points divide this stretch of coast into three bays. These bays are backed by high peaks and the sea usually breaks along their shores, which are high, rocky, and wooded.

Ponta do Focinho de Cao (1˚36'N., 7˚20'E.), located 3.2 miles NNW of Ponta do Grosso, is a salient headland which is fronted by rocks on its NW side. A peak, 263m high, stands 0.5 mile inland of this point.

3.83 Baia das Agulhas (1˚37'N., 7˚22'E.), providing the safest and best anchorage in the island, lies between Ponta do Focinho de Cao and Ponta Iola, 3 miles NE. This bay, which is sheltered from the SE winds of the tornado season, is free from off-lying dangers; the depths decrease regularly toward the shore.

Five hills stand close to the shore of the bay and are connected by low land. They give the appearance of being separate conical islets when seen from the W. The higher peaks of the island can be seen in the background. The shore is mostly fringed by reefs and numerous streams flow into the bay through the valleys which separate the lower hills.

Good anchorage for large vessels can be found, in a depth of 22m, within the bay and E of the N extremity of Ponta do Focinho de Cao. Tornadoes blow from the E, but care should be taken, as they may be squally after coming over the high land.

Ilha de Sao Tome from NE

Ponta Hora (1˚42'N., 7˚24'E.) is located 2.5 miles N of Ponta Iola and 2 miles SW of Ilheu Bombom. A few small bays lie along this stretch of the coast and afford anchorage to small vessels. They are sheltered from the prevailing wind, but are subject to violent squalls occasioned by the proximity of the mountains.

Ilha de Sao Tome

3.84 Ilha de Sao Tome (0˚15'N., 6˚37'E.) lies 82 miles SSW of Ilha do Principe. It is larger and of greater commercial importance than Ilha do Principe, but has a lack of sheltered anchorages. Calms, variable winds, and strong currents prevail in the vicinity of this island.

Ilha de Sao Tome is very mountainous and Pico de Sao Tome, its summit, rises at the W side of the central part. This summit attains a height of 2,024m, but is often hidden by clouds. The sides of the peak are covered with dense forests and numerous streams flow down them. The island is reported to present three conspicuous peaks when seen from the NE at a distance of about 60 miles.

The water in the vicinity of the island is very clear and the bottom can be seen distinctly in depths of 10m. During the months of October and November, sperm whales are found off the S end of the island.

Tides—Currents.—When approaching Ilha de Sao Tome from the W, it is advisable, in order to take full advantage of the Guinea Current, for vessels to keep N of 1˚30'N until the longitude of 6˚E has been attained. Vessels will thereby avoid the South Equatorial Current, which is found in that latitude to the W of the above meridian and, at times, even farther N. This latter current sometimes surrounds Ilha de Sao Tome and to the N of the island, in a longitude of about 6˚E, has been found to set to the W. The current usually sets between NNE and NNW at the E side of the island.

Caution.—It is reported (1990) that the navigation lights on Ilha de Sao Tome are unreliable.

It was reported (1995) that several fish havens had been established up to 5 miles off the coasts of Ilha de Sao Tome. They are marked by red buoys which have bamboo masts and red or yellow flags.

3.85 Ponta Cruzeiro (0˚25'N., 6˚40'E.) is the N extremity of Ilha de Sao Tome. Between this point and Ponta Praiao, 9.2 miles SE, the NE coast of the island is fronted by an extensive shoal with depths of less than 10m.

Porto de Ferao Dias lies 0.8 mile ESE of Ponta Cruzeiro and is fronted by a concrete pier. Large vessels can obtain anchorage, in a depth of 13m, sand, about 1 mile NE of Ponta Cruzeiro.

Ilheu das Cabras (0˚25'N., 6˚43'E.) lies 3.3 miles E of Ponta Cruzeiro, near the edge of the coastal shoal bank. This island consists of two hills, about 90m high. A light is shown from a tower, 5m high, standing on the summit of the NE hill.

3.86 Baia de Ana Chaves (0˚21'N., 6˚44'E.) is entered between Ponta Okedelrey, located 5 miles SE of Ponta Cruzeiro, and Ponta Sao Sebastiao, 1 mile SE. A hospital is situated on Ponta Okedelrey and four radio masts stand close SW of it. A conspicuous barracks building stands 0.3 mile SW of the hospital.

A fort, from which a light is shown, stands on Ponta Sao Sebastiao. An area of reclaimed land projects 0.2 mile NNW from this point and its N end forms a quay with a depth of 3m alongside.

Although open to E and NE winds, the bay offers a convenient anchorage to small vessels, except during the tornado season. Depths of less than 2m front the head of the bay and extend up to 0.3 mile seaward.

Three detached banks, with depths of less than 5m, lie about 2.7 miles NNE, 2 miles NNE, and 1.8 miles NE of Ponta Sao Sebastio.

3.87 Sao Tome (0˚21'N., 6˚44'E.) (World Port Index No. 46380), the capital of the island, stands along a sandy beach at the head of Baia de Ana Chaves. This town includes several good buildings of modern construction. A cathedral and several churches are also prominent.

Vessels moor within and off the bay and work cargo via lighters. Vessels of moderate to deep draft should anchor, in an appropriate depth for their draft, on the alignment of the lighted range shown from Ponta Okedelrey. It is reported (1986) that a vessel anchored, in a depth of 10m, mud and soft sand, about 0.7 mile NNE of Ponta Sao Sebastiao, good holding ground, but poor protection from the open sea.

Small vessels may anchor, in depths of less than 5m, in the inner part, but the sea breaks right across the bay after tornados or when the swell sets in. Pilotage is not compulsory and there are no official pilots. However, the Port Captain can be contacted by VHF and will act as a pilot if requested.

Caution.—The transit of the lighted range situated on Ponta Okedelrey is not very restrictive and the structures are easily concealed by the afternoon shadows.

Unexploded ordnance is reported to have been dumped on the banks lying NE and NNE of Ponta Sao Sebastiao.

The long swell can often make lighterage operations difficult.

Vessels approaching from SE or S should keep in depths of more than 35m and at least 1.5 miles offshore until they reach the lighted range leading to the anchorage.

3.88 Ponta Praiao (0˚18'N., 6˚46'E.), located 3.2 miles SSE of Ponta Sao Sebastiao, is the E extremity of Ilha de Sao Tome. It is a salient point of moderate height and is surrounded by drying rocks. The point is located near the SE end of a plain, which constitutes the N part of the island, and the land rises steeply to the S of it. A radio mast, 33m high, stands close W of the point and a church, with a prominent tower, is situated 4.5 miles W of it.

Between Ponta Praiao and Ponta do Io, 12 miles SW, the coast is irregular, with rocky heads and sandy bays. The land rises regularly from the shore and is intersected by several rivers.

Ilheu de Santana lies about 0.7 mile offshore, 3.2 miles S of Ponta Praiao. It is 50m high, rocky, and covered with bushes. The passage leading between this islet and the coast has no known dangers, but vessels are advised to keep outside in order to avoid squalls which prevail inshore.

Ponta Homem da Capa (0˚01'N., 6˚31'E.), the S extremity of Ilha de Sao Tome, is located 10 miles SW of Ponta do Io. The coast between is indented by several bays.

Caution.—Magnetic anomalies have been reported to exist up to 10 miles SW of Ponta Praiao.

3.89 Sete Pedras (0˚02'N., 6˚38'E.) lies about 2.5 miles offshore, 4.7 miles SSW of Ponta do Io. It consists of a group of rocks, the largest being 42m high. When seen from N, these rocks have the appearance of a vessel under sail. By day, these rocks do not constitute a danger as they are steep-to, but they should not be approached at night.

Ilheu Gago Coutinho (0˚00'N., 6˚32'E.) lies 1.2 miles S of Ponta Homem da Capa. It is 96m high, covered with large trees, and is the largest of the islets lying off Ilha de Sao Tome. Two summits rise from this islet; the N summit is a conical hill. A light is shown from a tower with a dwelling, 9m high, standing near the center of the islet.

Canal das Rolas separates llheu Gago Coutinho from the S extremity of Sao Tome and should be used with great caution.

Ponta Furada, the W extremity of the island, is located 14 miles NNW of Ponta Homem da Capa. The coast between is mostly rocky and cliffy, with a few beaches. It is fringed by several small islets.

A light has been established on the island.

Ponta Diogo Vaz (0˚19'N., 6˚30'E.), located 4.6 miles NNE of Ponta Furada, is rounded and steep-to. Enseada da Rosema, an indentation in the coast, lies between Ponta Figo, located 4 miles NE of Ponta Diogo Vaz, and Morro Carregado, 4.7 miles NE. A small bay, which lies at the S end of this indentation, is reported to offer excellent anchorage with close in deep water.

Morro Carregado (0˚25'N., 6˚37'E.), rising 4.8 miles W of Ponta Cruzeiro, is high and peaked. The point on which it stands is faced by steep, rocky cliffs.

Pagalu

3.90 Pagalu (Annobon) (1˚26'S., 5˚37'E.) lies 105 miles SSW of Ilha de Sao Tome and is the smallest island lying in the Bight of Biafra. It is mountainous and rises in varied and picturesque forms to a considerable elevation in the central part, which is formed by three main peaks.

Pico del Fuego (Pico do Figo), the northernmost of these peaks, is in the form of a truncated cone. It is 454m high and has sides which are heavily wooded to within a short distance of the summit. A small fresh water lake lies close to the foot of this peak, on its SW side.

Pico del Centro, 630m high, rises 1 mile S of the lake; Pico Surcado, 655m high, rises 1 mile farther SE.

The prevailing winds, which are from the S and SW, blow with moderate force and little variation throughout the year, enabling vessels under the shelter of the land to ride at anchor in a smooth sea. Only during the period from March to September, when tornadoes occur and strong E winds blow directly into the anchorages, is any danger to be apprehended. The gloominess of the sky and the heavy thunder and lightning by which they are preceded always gives timely notice of storms.

In the vicinity of the island, the current normally sets NW from November to April and NE from April to August. The strength varies and the current attains a rate of 0.5 knot to 1.8 knots. The tidal currents are always very weak.

Caution.—The present charted position of Pagula is based on a 1991 ship's report, which placed the island 1 mile E of its previously-charted position. Charted depths are also based on old surveys. Mariners should exercise caution when navigating in the vicinity of Pagala.

3.91 Punta del Palmar (1˚24'S., 5˚37'E.) is the N extremity of Pagalu. A light is shown from a tower, 7m high, standing near this point.

Punta Piramide, located 0.2 mile SE of Punta del Palmar, is low, sandy, and fronted by numerous rocks. Islote Piramide, the highest and most conspicuous of these rocks, is bare and conical.

San Antonio (1˚24'S., 5˚37'E.), the largest town on the island, stands close S of Punta del Palmar. When approaching from seaward, the land in this vicinity is difficult to identify, as the mountains are nearly always covered by clouds and the town is not easily distinguished. At such times, Islote Piramide is a useful landmark.

Punta del Paso is located 1.2 miles SE of Punta del Palmar. The coast between is fronted by a shoal with depths of less than 5m. This point rises almost perpendicularly to a bluff and has needle-shaped rocks on its seaward face.

Islote Tortuga (1˚24'S., 5˚38'E.), 50m high, lies 0.8 mile NNE of Punta del Paso. This islet is steep-to and two rocks lie close off its NE extremity. Islote del Paso, a small and flat islet, lies 0.3 mile SW of the S extremity of Islote Tortuga.

The anchorages lying between Punta del Palmar and Punta del Paso should be approached with caution, as this area has not been thoroughly surveyed and patches of coral evidently exist. The best anchorage lies, in depths of 22 to 27m, sand with good holding ground, 0.7 mile NE of San Antonio.

3.92 From Punta del Paso, the coast trends SSE for 0.8 mile to Punta Dudjiguele. Bahia de San Pedro, at the head of which stands the village of San Pedro, lies between this point and Punta Jasgania, 0.3 mile SSE.

Punta Dologany, located l.3 miles S of Punta Jasgania, is a rocky and moderately high point. Pico Surcado, 655m high, rises 0.7 mile NW of this point.

Between Punta Dologany and Punta Mofina, 0.4 mile SSW, the coast is indented by two small bays.

Punta de San Antonio (1˚28'S., 5˚37'E.) is located 1 mile W of Punta Mofina. The S coast of Pagalu extending between these points is dominated by high land which rises inland. Punta de San Antonio, which is marked by a light, is fronted by several rocks on which the sea generally breaks. Three conspicuous high and conical rocks lie centered about 1 mile S of this point.

Islote Adams, small and rocky, lies 0.4 mile S of Punta Mofina. This islet presents two distinct peaks when seen from E or W.

3.93 Punta Alvaro (1˚27'S., 5˚37'E.), located 0.7 mile NW of Punta de San Antonio, is surmounted by a moderately high peak, the summit and sides of which are marked by numerous pinnacle rocks.

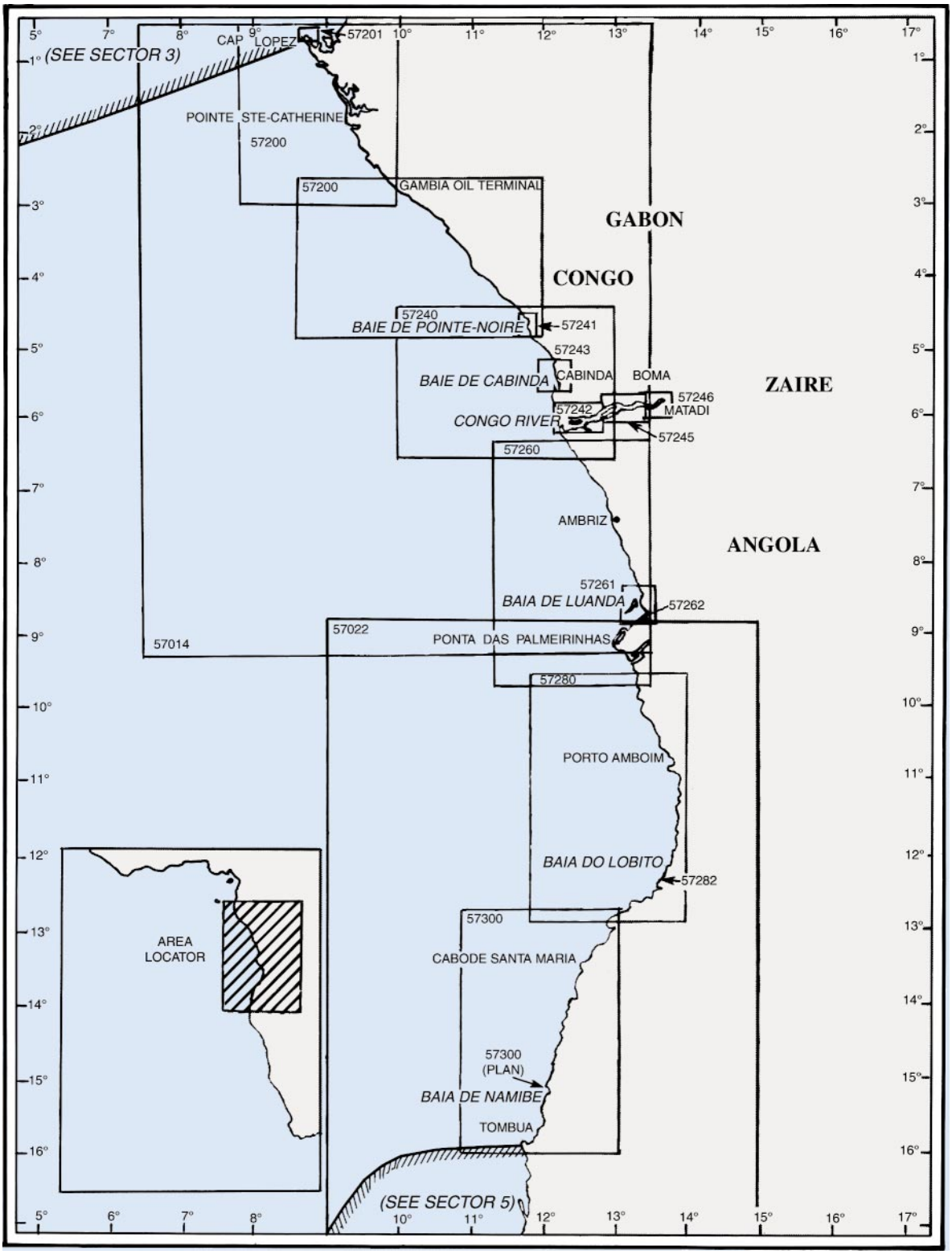
Punta Jatupa is located 1.5 miles NNW of Punta Alvaro. The stretch of coast extending between these points is indented and

Bahia de Santa Cruz is formed at the S end. The town of Santa Cruz stands at the head of this bay. The sea breaks heavily along the shore extending between Santa Cruz and Punta Jatupa.

Punta Jiscoy (1˚25'S., 5˚36'E.), located 0.5 mile NNW of Punta Jatupa, is the W extremity of Pagalu. A section of steep and rocky cliffs, 0.4 mile wide, is centered 0.4 mile NE of this point.

Islote Yebatelu, a small and detached islet, lies close offshore, 0.6 mile NNE of Punta Jiscoy.

The sandy shore of Pagalu extends 0.5 mile NE from abreast Islote Yebatelu to Punta del Palmar and is fringed with rocks.



Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.

SECTOR **4** — CHART INFORMATION

SECTOR 4

GABON, CONGO, ZAIRE, AND ANGOLA—CAP LOPEZ TO PONTA ALBINA

Plan.—This sector describes the SW coast of Africa from Cap Lopez to Ponta Albina, and includes the Congo River. The descriptive sequence is from N to S.

General Remarks

4.1 The coast extending between **Cap Lopez** (0˚37'S., 8˚43'E.) and the Congo River, about 390 miles SE, is bordered by a narrow sandy beach on which the heavy surf breaks, particularly during the dry season. The landing of boats is impossible on this coast, except in a few places, and then only on exceptionally fine days.

The lagoon entrances lying along this stretch of coast change position from year to year. These river mouths, which can be often easily identified on radar, are marked by a discoloration of the water which extends, in places, up to more than 1 mile offshore during the rainy season.

All of the small coastal indentations located S of the Equator recede in a SE direction and are protected on their W sides by low tongues of land which are prolonged by shoals or spits. This peculiarity of form is probably caused by the combined action of the SW swell and the prevailing current. Most of these indentations are difficult to identify from seaward because their low entrance points cannot be distinguished from the background.

Between Cap Lopez and the Congo River, the 200m curve lies nearly parallel with the coast at a distance of about 35 miles offshore. Depths of 9 to 13m are found about 2 miles offshore. The bottom consists of mud in depths of over 100m, but consists of sand closer inshore.

At Ponta das Palmerinhas, 185 miles SSE of the Congo River, the 200m curve approaches to within 5 miles of the coast.

The coast between the Congo River and **Ponta das Salinas** (12˚50'S., 12˚56'E.) provides several anchorages, the principal ones being at Luanda, Porto Amboim (Benguela Velha), Lobito, and Baia de Benguela. Between Benguela and Tombua (Porto Alexandre), 210 miles SSW, great depths lie close to the coast and anchorage is impossible, except in a few sheltered bays.

At a distance of 9 miles off the mouth of the Congo River, the surface water is still quite fresh. It is only partially mixed with salt water at a distance of about 40 miles offshore. The resulting discoloration caused by the fresh water has, at times, been observed up to 300 miles from the coast.

Winds—Weather.—Along most of this coast, a SW or W breeze (sea breeze) is prevalent from late morning until 2100 hours. At about midnight, a SE or E breeze (land breeze) begins and becomes light and variable by morning.

Tides—Currents.—The range of tide is comparatively small along this coast, only exceeding 1.8m at springs in a few of the river estuaries. The tidal currents are weak except in the vicinity of the few main rivers.

The Benguela Current flows N along the W coast of Africa from the vicinity of the Cape of Good Hope to the Gulf of Guinea. It attains rates of 1 knot within about 40 miles of the coast and 0.4 to 0.8 knot farther offshore. This current is usually stronger in December and January, when the SE trade winds are well established.

Between Cap Lopez and the Congo River, a current generally sets steadily in a NW direction, sometimes attaining a rate of up to about 2 knots. It is formed by the Benguela Current and the current which flows out of the Congo River. This resultant current then turns W off Cap Lopez and becomes part of the South Equatorial Current. Inshore, the direction and rate of the current are largely influenced by the formation of the land and the winds. During steady N winds, which are very rare, the direction of the current is sometimes reversed.

Caution.—During the rainy season, debris of all kinds may be encountered at considerable distances from the coast and as far N as **Pagalu** (1˚26'S., 5˚37'E.).

The light sandy color of the coast, as well as the extreme haziness of the atmosphere that generally prevails, may tend to cause mariners to overestimate the distance from the shore. Therefore, vessels are advised to maintain a prudent distance from the coast. This applies particularly in the area lying between Ponta das Salinas and Ponta de Sao Jose, 22 miles NE.

Vessels are cautioned that security off the African coast and within some ports is a serious problem. In recent years (1986-2000), several attacks by pirates and thieves have been reported. These have generally taken place at the outer anchorages, but some have occurred while berthed alongside.

Cap Lopez to Pointe Banda

4.2 **Cap Lopez** (0˚37'S., 8˚43'E.), the N extremity of Ile Lopez, has been previously described in paragraph 3.67. Several flares are situated in the vicinity of the cape and a conspicuous flare, position approximate, stands on the shore about 57 miles SSE of them.

The coast between Cap Lopez and Ombue, 66 miles SSE, is uniformly thickly-wooded, while between Ombue and Sette Cama, 64 miles SSE, it consists of large patches of bare ground alternating with thick jungle.

The mouth of the Animba River, which is an arm of the delta of the Ogoove, lies 24 miles S of Cap Lopez. The river is not navigable; its entrance is bordered on the W side by a long narrow tongue of sand. During the rainy season, enormous amounts of fresh water discharge from the river mouth and extend up to 4 or 5 miles offshore.

Grondin Oil Drilling Area (1˚10'S., 8˚40'E.), which may best be seen on the chart, lies between 7 and 60 miles S of Cap Lopez. It extends up to 28 miles offshore and is marked by lighted buoys. A light shown from a structure standing (position approximate) 66 miles SSE of Cap Lopez indicates the SE end of this area.

Numerous wells, production platforms, drilling rigs, flares, submarine pipelines, and associated obstructions lie within this drilling area.

Caution.—A restricted area, which may best be seen on the chart, surrounds the Grondin Oil Drilling Area. Only vessels employed by the oil installations and tankers proceeding to and from the terminals may navigate within this area.

Drilling rigs and associated structures and obstructions, which may be unlit and not charted, are reported to be situated within the restricted area.

4.3 Gombe-Beta Marine Terminal (1˚12'S., 8˚56'E.) lies within the Grondin Oil Drilling Area, 37 miles SSE of Cap Lopez. It consists of a 78,000 dwt storage tanker permanently moored in a depth of 15.2m. Vessels of up to 150,000 dwt and 280m in length can be handled. Vessels are moored to the bow of the storage tanker and their sterns are made fast to mooring buoys.

Vessels should contact the terminal on VHF channel 8 when within range and obtain berthing instructions. Vessels waiting to berth should anchor in a designated area, with a radius of 0.5 mile, centered about 1.7 miles NW of the terminal. Pilotage is compulsory. Pilots, who act as mooring masters, can be contacted by VHF and board in the anchorage area.

4.4 Oguendjo Oil Terminal (1˚28'S., 8˚55'E.) lies within the Grondin Oil Drilling Area, 51 miles SSE of Cap Lopez. It consists of an SBM to which a 238,400 dwt storage tanker is permanently moored.

The terminal lies in a depth of 27.4m and can handle vessels of up to 170,000 dwt and 18.3m draft. Vessels are berthed during daylight only and are moored to the bow of the storage tanker.

Production platforms are situated 2.5 miles E and 1.5 miles SW of the terminal.

Pilotage.—Pilotage is compulsory. Pilots, who act as mooring masters, can be contacted on VHF channel 16 and board in the designated semicircular boarding zone centered about 1.7 miles NW of the SBM.

Vessels waiting to berth may anchor in a designated area, which lies 13 miles SE of the terminal and is limited by 1˚36'S, 1˚40'S, 8˚57'E, and 9˚02'E.

Vessels should send an ETA 72 hours, 48 hours, and 24 hours prior to arrival. The 72-hour message should contain the following information:

1. ETA, last port of call, and agent.
2. Estimated draft, fore and aft, upon arrival.
3. Quantity and grade of oil to be loaded.
4. Estimated sailing draft.
5. Clean bill of health.
6. Other details as requested by the terminal.

Vessels should maintain a continuous listening watch on VHF channel 16 starting not less than 12 hours prior to arrival in order to receive instructions. An access lane, 1.7 miles wide, leads in a NW direction and may best be seen on the chart. It extends for 12 miles from the anchorage area to the mooring master boarding zone.

4.5 Pointe Sainte-Catherine (1˚53'S., 9˚16'E.), a slight projection, is fronted by a reef on which the sea breaks heavily. From the N, this point appears as an isolated clump of tall trees resembling an island, but from the S, the coast appears craggy. Some hills rising close S of the point give it a bold appearance. The land behind the shore, which is fringed by a beach, rises gently with clearings here and there.

Pointe Guega is located 4.5 miles N of Pointe Sainte-Catherine and fringed by rocks.

The village of Iguela, situated 4.5 miles SE of Pointe Sainte-Catherine, stands on a narrow strip of land which separates Lagune Ngobe from the sea. An airfield is situated near this village. Anchorage may be obtained, in a depth of 9m, SW of the village and about 1.5 miles offshore. Two beacons, each surmounted by a square, form a range which leads, clear of dangers, in a NE direction toward the anchorage. From this anchorage, the flagstaffs of some factories can be seen over the tops of the trees.

Caution.—This part of the coast should not be approached within a distance of about 4 miles by vessels without local knowledge.

4.6 Tchatamba Terminal (2˚04'S., 9˚36'E.), a Floating Storage and Offloading facility (FSO), is permanently moored in a depth of 46m on a heading of 011˚. The terminal is connected by a submarine pipeline to a production platform located 0.5 mile ESE. Berthing is conducted during daylight hours only but unberthing can be done at any time. The terminal can accommodate tankers up to 135,900 dwt.

Pilotage.—Pilotage is compulsory and is available 24 hours. Pilots board the vessel 3 miles NW of the terminal. Vessels should arrive by 1500 to ensure that mooring operations are complete by 1830.

Regulations.—Vessels should send their ETA 5 days, 72 hours, 48 hours, and 24 hours in advance. If a vessel departs from a port within 12 hours of the terminal, the ETA should be sent immediately upon departure from that port and confirmed 6 hours prior to arrival.

Anchorage.—Anchoring is available within 2 miles of position 1˚59'S, 9˚10'E in sand or clay.

Caution.—There is a restricted area, with a radius of 3 miles, centered on the terminal. No vessel may enter the restricted area without permission from the terminal.

4.7 Pointe Komandji (2˚19'S., 9˚36'E.) is located 34 miles SE of Pointe Sainte-Catherine. The coast between recedes slightly and its aspect becomes more varied. A narrow beach fronts the shore in some places and trees grow down to the water in other places. In the S part of this stretch, the mouths of rivers are indicated by narrow gaps in the trees. Inland, the country is more elevated and a few hills form a chain which runs parallel with the coast. The surf breaks heavily along this entire stretch of coast, except in a few places where landing may be effected in fine weather.

Pointe Komandji is rounded and difficult to identify from the W. However, several large green patches are located at the extremity of Pointe de Gaca, 3 miles S, which help to distinguish this locality. The neighboring coast is slightly elevated and covered with brushwood, through which several streams wind. The large mouths of these streams form a succession of lagoons and marshes.

Drying rocks front the coast and the sea breaks about 1 mile offshore. Several villages stand between Pointe Komandji and two points named Pointe Magamba and Pointe Milango, which are located 4 miles and 7 miles, respectively, SSE.

Caution.—Oil and gas exploration is being carried out along this coastal area and vessels are warned that numerous wellheads, submerged pipelines, drilling rigs, and platforms may be encountered. Vessels should also exercise care when navigating in this vicinity, as many of the associated structures and installations are often moved and are not charted. In addition, some of the platforms and structures may be disused, abandoned, and unlit.

4.8 Sette Cama (2˚31'S., 9˚45'E.), situated 15 miles SE of Pointe Komandji, stands at the root of a tongue of land which separates the channel leading to Lagune Ndogo from the sea. The seaward entrance of this channel lies 9 miles SE of Pointe Komandji. Several buildings, including a factory with a flagstaff, stand in the vicinity of Sette Cama. In addition, a small airfield is situated nearby. Communication with the factory can be carried out by the International Code of Signals.

Several rocky shoals front the coast and lie up to 1 mile offshore. They have depths of less than 5m and are usually marked by breakers. A range, formed by two white beacons, indicates a passage which leads in a NE direction between the shoals to an anchorage. This passage is about 0.3 mile wide and provides access to vessels with drafts up to 5.8m. Vessels are advised to stay at least 2 miles offshore until the range beacons have been identified. When approaching the anchorage, vessels are advised to keep the front beacon open a little N of the rear beacon. Large vessels can anchor, in a depth of 11m, on the range. Smaller vessels may proceed between the shoals and anchor, in a depth of 6.7m, about 0.5 mile offshore. There is usually a heavy swell at the anchorage and the bottom is very uneven with a rocky bottom. Landing should not be attempted.

The N end of a chain of coastal hills, known as Monts Santo Espirito, rises to the S of Sette Cama and forms a good landmark. Several large clearings are located S of these hills and give the land a cultivated appearance.

4.9 Pointe Pedras (2˚40'S., 9˚53'E.), located 12 miles SE of Sette Cama, projects 1 mile from the line of the coast and shows up well from the S. Several isolated sand hills stand on this point and slope S to the banks of the Riviere Massetche, which is the outlet of Lagune Massetche. A shoal patch, with a depth of 3.7m, lies about 3.5 miles SW of the point and several rocks, some of which dry, lie up to about 2 miles NW of the point.

Between Pointe Pedras and Pointe Banda, 97 miles SE, the 200m curve lies parallel with the coast and about 35 to 38 miles offshore. The regularity of this depth curve may be of assistance to vessels during June, July, and August, when fog may conceal the land.

The coast between Pointe Pedras and Pointe Matouti, 65 miles SE, is low and wooded, with high flat ranges inland. Between the latter point and Pointe Banda, 32 miles SE, it consists of a sandy beach backed by forests with inland ranges of hills.

4.10 Gamba Oil Terminal (2˚50'S., 10˚00'E.) (World Port Index No. 46453) is situated 10 miles SE of Pointe Pedras and consists of a tank farm standing 0.5 mile inland. A light is shown from a framework tower, 40m high, standing close SW of the tank farm; several conspicuous flares are situated in its vicinity. An aeronautical radiobeacon is reported (1995) to be situated about 4 miles ESE of the terminal.

An offshore loading facility, consisting of an SBM, lies 5 miles SW of the terminal and is connected to the shore by a submarine pipeline. It lies in a depth of 20.2m and can handle vessels of up to 150,000 dwt and 17.2m draft.

Vessels can anchor, in a depth of 25m, about 2 miles NW of the SBM. Pilotage is compulsory. Pilots, who act as mooring masters, can be contacted by VHF and board in the anchorage area. They remain on board during the entire stay. Berthing can be undertaken by day or at night. Vessels must keep their engines in readiness to move at all times.

Vessels should send an ETA at least 4 days before arrival. A confirmation message should be sent 24 hours before arrival. Vessels should then contact the terminal on VHF channel 12 when within range.

Caution.—A restricted area, 4 miles wide, extends up to 6.5 miles SW from the coast and encloses the offshore loading facility. Vessels not proceeding to or from the loading facility are prohibited from entering this area.

The offshore loading facility is subject to heavy swells and operations are sometimes delayed.

4.11 The **Riviere Nyanga** (2˚58'S., 10˚15'E.) lies with its mouth located 29 miles SE of Pointe Pedras and runs parallel to the coast, behind a narrow spit of sand, for the last 2.5 miles. The entrance, which is fronted by a large and shallow bar, was reported (1980) to be about 200m wide and radar conspicuous. It is reported to be dangerous as strong currents and a heavy sea run across the bar.

A light is shown from a structure standing 1.2 miles NW of the river entrance when a vessel is expected. A shoal, with a least depth of 6m, is reported (1976) to lie about 4.5 miles SW of the light.

Vessels loading timber can anchor, in depths of 12 to 13m, about 1.5 miles SW of the light. It was reported (1980) that vessels of up to 33,000 dwt and 176m in length had moored in this roadstead.

Pointe Panga (3˚15'S., 10˚32'E.) is located 24 miles SE of the mouth of the Riviere Nyanga. The coast between consists of a sandy beach backed by marshy and brush-covered land. It is featureless and has no prominent landmarks.

When seen from the N, the point presents three or four saddle-shaped summits and a conspicuous dark red cliff which is surmounted by dense woods. It is one of the most prominent landmarks along this part of the coast and cannot be mistaken. A rocky reef extends up to about 1 mile W of the point; a small cove indents the shore close N of it. A pillar is located 2 miles N of the point.

Baie de Mayumba is entered between Pointe Panga and Pointe Matouti (Pointe Kouango), 12 miles SSE. It affords good shelter during S and SE winds. The shore consists of a fine sandy beach which is fronted by breakers throughout almost its entire length and is backed by wooded hills. Lagune

Mbanio empties via the Riviere Mayumba into the SE part of this bay.

4.12 Pointe Matouti (Pointe Kouango) (3˚26'S., 10˚38'E.) consists of several low hills which slope seaward. It terminates in a low point which is surmounted by some huts. A radio mast was reported (1992) to stand 1 mile NE of the point. Rocks, some of which dry, fringe the point and extend up to about 0.2 mile offshore. A reef extends up to about 0.6 mile NNW from the point and an islet, just showing above the water, lies on it.

A hill rises E of Pointe Matouti and is surmounted by several houses which are conspicuous from the NW, but are not visible from the S. The residency building, with a flagstaff, and some factories are situated at Mayumba, 1 mile NE of Pointe Matouti. These buildings and the road leading to them are prominent. A small airfield is also situated in the vicinity.

Vessels loading timber can anchor, in depths of 13 to 14m, sand and mud, about 1 mile offshore, 3.8 miles N of Pointe Matouti. It was reported (1995) that vessels of up to 19,500 dwt and 156m in length had moored in this roadstead.

The coast between Pointe Matouti and Pointe Banda, 30 miles SE, consists of a sandy beach which is backed by forests. Inland, the countryside rises to three ranges of hills. Lagune Mbanio lies parallel to the coast, between 16 and 37 miles SW of Baie de Mayumba.

Rocher Noir, 1.5m high, lies close offshore, 5 miles SE of Pointe Matouti. Roche Massanga, a large black rock, lies about 0.2 mile offshore, 3 miles SE of Rocher Noir. Both of these rocks are located on a coastal bank which extends up to 0.5 mile seaward.

4.13 Lucina Oil Terminal (3˚38'S., 10˚45'E.) (World Port Index No. 46454), which includes a loading facility, lies about 6 miles offshore, 17 miles SSE of Pointe Matouti. The terminal includes seven production platforms which are connected by submarine pipelines. Several prominent flares are situated on these platforms. The loading facility consists of an SBM and an 85,000 dwt storage tanker, which are moored in a depth of 34m. Vessels of up to 136,000 dwt can moor to the SBM. There is no restriction on draft.

Vessels must anchor, in a depth of 34m, about 2 miles NW of the SBM. Pilotage is compulsory. Pilots, who act as mooring masters, can be contacted by VHF and board in the vicinity of the anchorage area. These pilots are stationed at Gamba Oil Terminal and are transferred to the storage tanker by helicopter. They board from launches and remain on board dur-ing the entire stay. Vessels must keep their engines in readiness to move at all times.

Vessels should send an ETA at least 4 days in advance via the Gamba Oil Terminal. Confirmation messages should be send 72 hours, 48 hours, and 24 hours before arrival. Vessels should then contact the terminal by VHF when within range.

Caution.—A restricted area, which may best be seen on the chart, surrounds the loading facility. Vessels not proceeding to or from the loading facility are prohibited from entering this area.

Pointe Banda to Pointe-Noire

4.14 Pointe Banda (3˚49'S., 11˚00'E.), low and rounded, is difficult to distinguish. It may be identified by Colline de la Table, 50m high, which stands near the coast and is surmounted by a clump of palm trees and a village. The village of Sainte-Marie, situated 1.5 miles SSE of the point, is built on a hill, 20m high, and is somewhat prominent.

Anchorage may be taken by vessels with local knowledge, in a depth of 11m, mud, good holding ground, about 1 mile NNW of Pointe Banda.

Pointe Tshibobo, located 1.5 miles S of Sainte-Marie, is surmounted by a round hill which is clearly visible from the S.

Caution.—Offshore drilling operations, including seismic surveys, are in progress inshore of the 200m curve between Pointe Banda and the mouth of the **Riviere Massabi** (5˚02'S., 12˚01'E.). Within this area, drilling rigs, platforms, wellheads, and submarine pipelines may be encountered. Vessels should exercise care when navigating in this vicinity as many of the associated structures and installations are often moved and are not charted. In addition, some of the platforms and structures may be disused, abandoned, and unlit.

4.15 M'bya Terminal (Mayumba Terminal) (3˚53'S., 10˚56'E.) consists of three production platforms situated 7 miles SW, 7 miles SSW, and 4.8 miles WNW of Pointe Tshibobo. These platforms are connected by submerged pipelines and a mooring buoy, for the use of a storage tanker, lies close SE of the southernmost platform.

An offshore loading facility lies 5 miles WSW of Pointe Tshibobo. It consists of an SBM moored in a depth 30m. Vessels of up to 150,000 dwt and 18m draft can be handled at this facility.

Vessels should anchor, in a depth of 30m, about 1 mile W of the SBM. Pilotage is compulsory. Pilots, who act as mooring masters, can be contacted by VHF and board in the vicinity of the anchorage area. Vessels should send an ETA via their agent 72 hours, 48 hours, and 24 hours in advance. Vessels should then contact the terminal on VHF channel 16 when within range.

Caution.—A restricted area, which may best be seen on the chart, surrounds the terminal and the loading facility. Vessels which are not proceeding to or from the facility are prohibited from entering this area.

4.16 The coast extending between Pointe Tshibobo and Pointe Tchitembo, 29 miles SE, provides no shelter and is moderately high. It rises from a thick belt of trees to one or two ranges of hills which are less elevated than those farther to the N. Depths of less than 9m lie up to 4 miles seaward of the shore.

The seaward end of the boundary between Gabon and The Congo lies in the vicinity of the entrance to the Lagune Mekoundgi, about 9 miles SE of Pointe Tshibobo.

The **Riviere Conkouati** (4˚00'S., 11˚14'E.) lies with its entrance about 15.5 miles SE of Pointe Tshibobo. The sea breaks heavily about 0.4 mile off the mouth of this river, which is reported to be about 45m wide and radar conspicuous. Depths of less than 5m are reported to lie up to about 1.8 miles WSW

of the mouth. The village of Conkouati is situated on a tongue of sand at the S side of the river entrance.

The mouth of the Numbi River, lying 10 miles SE of the Riviere Conkouati, is also reported to be radar conspicuous. Its narrow entrance discharges black water and is encumbered with numerous black rocks. The village of Madingo is situated close inside the river mouth, on the E side.

Banc du Haoussa, with a least depth 8.8m, lies about 3.5 miles W of the mouth of the Numbi River, in the approaches to Baie de Lekonde. This latter bay is a slight indentation in the coast lying between the mouth of the Numbi River and Pointe Tchitembo, 4.5 miles S. The bay can only be entered by vessels with light drafts and local knowledge. A heavy swell sometimes sets into the bay and landing is often very difficult because of the surf.

Pointe Lekonde, located 1 mile N of Pointe Tchitembo, can be identified by a small bare hill, with a flat top, which rises close N of it. A conspicuous road descends from this hill. An isolated shoal, with a depth of 6.4m, lies about 2.5 miles NW of this point.

Banc du Promethee extends up to about 3 miles W from the coast between Pointe Lekonde and Pointe Tchitembo. It has depths of less than 5m, but does not break in calm weather.

An isolated shoal, existence doubtful, with a depth of 4m, lies about 4.2 miles W of Pointe Tchitembo.

4.17 The **Kouilou River** (4˚29'S., 11˚42'E.) lies 25 miles SE of Pointe Tchitembo. The coast between consists of a sandy beach backed by forests. Several streams flow into the sea along this stretch and a few small and land-locked lagoons lie close inland.

A line of low, bare hills stands behind the forests and is broken, 11.5 miles SE of Pointe Tchitembo, by a river. The village of Longobonda is situated in the vicinity of this river. The coast between this village and the mouth of the Kouilou River consists of sand dunes which appear white from seaward and are surmounted in a few places by palm trees.

Banc du Mulet (4˚28'S., 11˚33'E.), with a least depth of 5.8m, lies centered about 8 miles W of the entrance to the Kouilou River. It is a narrow ridge of hard sand and rock which lies parallel to the coast. An obstruction is reported to lie about 5 miles S of the N end of this bank.

The entrance to the Kouilou River is encumbered with shifting sand banks and a dangerous bar, on which the sea breaks heavily. During the rainy season, discolored water extends up to 7 miles seaward of the river mouth. The village of Bas Kouilou, a small wood-loading terminal, is situated close within the mouth of the river. Ocean-going vessels can anchor, in a depth of 9m, about 2 miles W of the river mouth, but cargo operations are frequently interrupted by winds, swells, and the condition of the bar.

Caution.—Several platforms, some of which have prominent flares, are situated about 26 miles W of the mouth of the Kouilou River. In addition, two production platforms are situated about 17 miles W of the river mouth.

4.18 Yombo Oil Terminal (4˚27'S., 11˚06'E.), an offshore loading facility, lies about 30 miles W of the mouth of the Kouilou River and consists of a 230,000 dwt storage tanker, moored in a depth of 100m. Production platforms are situated 1.5 miles SSW and 1.5 miles SW of it. Vessels can berth at the facility during daylight hours only. Vessels of up to 155,000 dwt, 280m in length, 53m beam, and 15m draft can be handled.

Vessels should anchor in a designated area, with a radius of 1 mile, centered 12.7 miles NW of the storage tanker. Vessels should send an ETA 72 hours, 48 hours, and 24 hours in advance; the terminal should also be notified if the ETA changes by more than 2 hours. Vessels should also maintain a listening watch on VHF channel 16 beginning 12 hours before arrival and contact the terminal when in range. Pilotage is compulsory. Pilots, who act as mooring masters, can be contacted by VHF and board in the vicinity of the anchorage area.

Caution.—A restricted area, which may best be seen on the chart, surrounds the terminal. Vessels not proceeding to or from the terminal are prohibited from entering this area.

4.19 Baie de Loango (4˚38'S., 11˚49'E.) is easily identified and lies between the entrance of the Kouilou River and Pointe Indienne, 12 miles SSW. The head of the bay, when seen from a distance of about 3 miles, appears as a thick line of trees of uniform height surmounting the beach. A flat-topped hill with precipitous shoulders shows above the treetops to the N and close inland of the head. A continuous chain of hills extends S from the vicinity of the head and decreases in elevation. Two prominent groups of hills, with bare summits, stand close S of the bay. The vegetation on these hills grows in lines and forms the appearance of cultivated fields separated by hedges.

Pointe Indienne (4˚39'S., 11˚47'E.) is low, wooded, and surmounted by the ruins of a lighthouse. It is easily identified from the N or S. Low cliffs, covered with vegetation, rise close inland of the point and are surmounted by several bare hills with a reddish tinge. A conspicuous white building stands l.5 miles E of the point and a flare is situated 0.7 mile SSE of it. The town of Loango is built on two bluffs, 1.8 miles ENE of the point.

A rocky spit, with depths of less than 10m, extends up to about 3 miles NW of Pointe Indienne and the sea breaks violently over it. A strong current, setting NNE, may be experienced off this spit. Another spit, narrow and sandy, extends up to about 3 miles NE of the point and encloses a salt water lagoon.

Good anchorage can be obtained, in a depth of 8m, excellent holding ground, about 2.5 miles N of Pointe Indienne. However, vessels should guard against E squalls, which are sometimes violent during the rainy season.

A conspicuous stranded wreck lies 1.3 miles S of Pointe Indienne.

Banc du Conflict (4˚42'S., 11˚45'E.), with a least depth of 8.4m, lies centered about 3 miles SSW of Pointe Indienne.

A prominent tank farm stands 4.8 miles SE of Pointe Indienne and a refinery, with a prominent flare, is situated 1.2 miles SE of it.

Caution.—A submarine pipeline extends 1.3 miles SW from a point on the shore located in the vicinity of the tank farm.

Port of Pointe-Noire (4˚47'S., 11˚50'E.)

World Port Index No. 46470

4.20 The Port of Pointe-Noire lies within Baie de Pointe-Noire, which is entered between Pointe Indienne and Pointe Noire, 8 mile SSE. The port is the principal harbor of the Republic of the Congo and includes several factories, saw mills, and palm oil production facilities.

Tides—Currents.—The tides rise about 1.6m at springs and 1.3m at neaps.

The current within Baie de Pointe-Noire usually sets NNE under the influence of the prevailing winds. It generally attains a rate of less than 1 knot, but may attain a rate of 1.1 knots during the month of May. The tidal currents within the harbor are weak.

Depths—Limitations.—Digue Exterieure, the main outer breakwater, extends 1 mile N in a curve from Pointe-Noire and forms the W side of the harbor. Digue Interieure, the inner breakwater, extends 0.5 mile E from near the head of Digue Exterieure and forms the N side of the harbor. A detached breakwater, 0.4 mile long, forms the E side of the harbor and may best be seen on the chart.

The main harbor entrance lies between the NW head of the detached breakwater and the E head of Digue Interieure.

Banc de l'Astrolabe lies about 1.7 miles NNE of the head of the outer breakwater. It has a least depth of 5.8m and lies parallel to the coast.

Banc Songolo, with a least depth of 6.4m, lies about 1.5 miles NE of the head of the outer breakwater.

Banc des Anglais, with a least depth of 13m, lies about 1.5 miles WNW of the head of the outer breakwater.

Banc du Sagittaire, with a least depth of 10m, and Banc de la Syzygie, with a least depth of 9.8m, lie about 1 mile WSW and 0.7 mile SW, respectively, of the head of the outer breakwater.

Banc de la Pointe, with depths of less than 5m, extends up to about 0.3 mile W of Pointe-Noire.

Quay G, situated at the N side of the harbor basin, is 520m long. It provides three berths for general cargo and ore and has depths of 9.4 to 13.2m alongside.

Quay D, situated at the W side of the harbor basin, is 720m long. It provides five berths for general cargo and has depths of 7.9 to 9.4m alongside.

Mole Quay, situated at the S side of the harbor, is 350m long. It provides two berths for general cargo, containers, and ro-ro vessels and has a depth of 9.5m alongside. An oil and gas tanker berth, with a depth of 11m alongside, is situated on the N side of Mole Quay.

A quay, 700m long, fronts the shore 1 mile E of the harbor entrance. It has depths of 3.7 to 4.9m alongside and is used by oil installation service vessels.

Tankers of up to 230m in length and 10.2m draft and bulk ore vessels of up to 200m in length and 10.4m draft can usually be accommodated within the port.

It was reported (1995) that silting in the entrance channel had reduced the maximum allowable draft for entering to 9.5m.

Aspect.—Two conspicuous silos, 28m high, stand 0.5 mile S of the head of the outer breakwater. Another silo, 50m high, stands near the root of the inner breakwater. A conspicuous spherical tank is situated 1.3 miles SSE of the head of the outer breakwater.

Pointe-Noire Light is shown from a prominent tower, 20m high, standing 0.4 mile E of the spherical tank. A prominent building, 54m high, and two radio masts, each 66m high, are situated 0.7 mile ESE and 1.6 miles ENE, respectively, of Pointe-Noire Light. A conspicuous cathedral, surmounted by two red lights, stands 0.6 mile SE of Pointe-Noire Light. An aeronautical radiobeacon is situated about 4 miles SE of Pointe-Noire Light.

A disused potash pier, 0.8 mile long, extends SW from a point on the shore located 2 miles SE of Pointe-Noire. It is reported to be radar conspicuous.

A lighted buoy, which marks the edge of the coastal bank, is moored about 0.2 mile N of the head of the inner breakwater. An outer lighted buoy is moored about 0.4 mile NE of the head of the outer breakwater. Two pylons, standing in the S part of the harbor, form a range which leads through the main entrance.

Pilotage.—Pilotage is compulsory for vessels over 100 grt and is available 24 hours, except for tankers, when it is available during daylight hours only. Pilots can be contacted by VHF and board about 0.5 mile NNE of the head of the outer breakwater. Vessels should send an ETA 24 hours and 12 hours in advance.

Anchorage.—Vessels generally anchor, in a depth of 14m, about 0.8 mile N of the head of the outer breakwater. The rollers at this anchorage are heavy and vessels are advised to keep an underkeel clearance of at least 3m.

An anchorage area, which may best be seen on the chart, lies close NE of the N head of the detached breakwater. It is used by vessels loading timber and has depths of 5.9 to 8.5m.

A designated anchorage waiting area lies about 4.5 miles NW of the head of the outer breakwater. It has a depth of 25m and is generally used by large vessels proceeding to Djeno Offshore Loading Terminal (see paragraph 4.22).

Caution.—A dangerous wreck lies about 1.2 miles ENE of the head of the outer breakwater.

The sandy shoals and drying banks lying NE and E of the N part of the outer breakwater are reported (1994) to be extending seaward.

A spoil ground area lies 1.5 miles NE of the head of the outer breakwater, between Banc de l'Astrolabe and Banc Songolo.

A log pond area, with several mooring buoys, lies adjacent to the E side of detached breakwater.

Vessels approaching from the N should use care to avoid Banc du Conflict. Vessels approaching from the S should use care to avoid the dangers lying up to 2 miles W of Pointe-Noire.

The head of the outer breakwater should be given a wide berth, as the swell forms heavy rollers, especially between May and October.

An anchorage prohibited area, which may best be seen on the chart, extends up to 0.5 mile N of the main harbor entrance.

Less water than charted has been reported (1995) to lie on the W side of the entrance channel and 0.5 mile N of the harbor entrance.

It was reported (1994) that reclamation and construction work is being carried out close E of the outer part of the outer breakwater and close N of the root of the inner breakwater.

Offshore oil drilling and production operations are in progress within the approaches to the port. Drilling rigs, platforms, well heads, and submarine pipelines may be encountered. Vessels should exercise care when navigating in the approaches, as many of the associated structures and installations are often moved and are not charted. In addition, vessels are prohibited from anchoring or fishing in the vicinity of the pipelines.

Pointe-Noire to the Riviere Massabi

4.21 The coast between Pointe-Noire and Pointe Mvasa, 7 miles SE, consists of a narrow beach backed by a ridge, about 12m high. The shore is exposed to the prevailing wind and swell and the surf breaks very heavily along it.

Pointe Mvasa (Fausse Pointe Noire) (4˚53'S., 11˚54'E.) is 7m high, rocky, and steep. The mouth of Lagune M'Vassa lies close N of this point.

The N end of Lagune Malonda lies about 11 miles SE of Pointe-Noire. This lagoon lies close inland and extends parallel to the coast for about 4 miles.

The **Riviere Massabi** (5˚02'S., 12˚01'E.) lies 19 miles SE of Pointe-Noire. Its mouth, which forms a common entrance with the Riviere Loeme, is only about 60m wide and has a least depth of 0.5m. Anchorage can be taken, by vessels with local knowledge, in a depth of 10m, fairly good holding ground, about 1 mile offshore. This stretch of coast has very few prominent landmarks.

The seaward boundary between The Congo and Angola (Cabinda) lies in the vicinity of the river mouth and is marked by beacons.

4.22 Djeno (4˚55'S., 11˚56'E.), a submarine pipeline landing terminal, lies 10 miles SE of Pointe-Noire. A light, which indicates the offshore oil installations, is shown from a structure, 17m high, standing on the shore. A pylon, 110m high, is situated close to the light.

Djeno Offshore Loading Terminal (4˚56'S., 11˚54'E.) (World Port Index No. 46472) consists of two SBM berths. SBM No. 1 is moored 2 miles SW of Djeno in a depth of 22m. SBM No. 2 is moored 3 miles SW of Djeno in a depth of 29m. Both SBMs can handle vessels of between 40,000 and 140,000 dwt, up to 320m in length, and up to 16m draft. Partially-loaded vessels of up to 240,000 dwt can also be handled.

The prevailing current in the vicinity of the terminal runs strongly NW. Vessels must have their engines available at all times. Vessels should send an ETA 72 hours, 48 hours, and 24 hours in advance. Pilotage is compulsory. Pilots, who act as mooring masters, are provided by the station at the Port of Pointe-Noire. They can be contacted by VHF and board about 2.3 miles W of the head of the outer main breakwater.

Caution.—A restricted area extends up to 1 mile from the terminal. Vessels not proceeding to or from the terminal are prohibited from entering this area.

If weather conditions are poor, the maximum draft allowable for entry may be reduced.

4.23 Yango Oil Field (4˚44'S., 11˚24'E.) lies 33 miles WSW of Djeno. It consists of five platforms, with a flare situated at the center one.

Kitina Oil Field (4˚55'S., 11˚23'E.) lies 9 miles SSW of Yango Oil Field and consists of one platform.

Sendji Oil Field (4˚47'S., 11˚28'E.) lies 5 miles SE of Yango Oil Field and consists of several platforms.

Tchibouela Oil Field (4˚54'S., 11˚40'E.) lies 17 miles W of Djeno and consists of three platforms.

Tchendo Oil Field (5˚02'S., 11˚39'E.) lies 18 miles WSW of Djeno and consists of one platform.

Emeraude Oil Field (5˚03'S., 11˚47'E.) lies 11 miles SW of Djeno. It consists of thirteen platforms in the N part and seven platforms in the SE part.

Likouala Oil Field (5˚13'S., 11˚44'E.) lies 22 miles SW of Djeno and consists of two platforms. The offshore loading terminal is located about 2 miles E of the S platform. Vessels waiting to load should stop and drift in the waiting area, which has a diameter of 6 miles and is located about 13 miles NW of the N platform. Vessels should ensure they do not drift E of longitude 11 27.5'E.The mooring master boards about 3 miles N of the offshore loading terminal.

4.24 N'Kossa Oil Field (5˚11'S., 11˚34'E.) lies 30 miles SW of Djeno and consists of two platforms; a floating production barge; N'Kossa 1, a floating oil storage/loading vessel; and N'Kossa 2, a floating LPG storage/loading vessel. Vessels up to 280,000 dwt can be accommodated at N'Kossa 1.

Pilotage.—Pilotage is compulsory. The mooring master boards at 5˚13'S, 11˚36'E and remains on board the vessel for the duration of the cargo transfer.

Anchorage.—A designated tanker (waiting area) anchorage, with a radius of 1.5 miles, has been established 11.5 miles W of Djeno. A designated approach channel leads 14 miles SSW from this anchorage area and passes between Emeraude Oil Field and Likouala Oil Field, on the E side, and Tchendo Oil Field, on the W side.

Vessels can also drift in the waiting area, which has a radius of 3 miles and is best seen on the chart, located about 13 miles NW of the terminal, although caution is necessary as vessels should not allow themselves to drift E of 11˚36'E.

Caution.—Restricted areas, the limits of which may be seen on the chart, enclose some of the above oil fields. Vessels without permission are prohibited from navigating within these areas.

Numerous submarine pipelines and cables lie in the vicinity of the above oil fields and may best be seen on the chart. Vessels are prohibited from anchoring or fishing in their vicinity.

Exploration and production operations are in progress in the vicinity of the above offshore fields. Numerous drilling rigs, platforms, and well heads may be encountered. Vessels should exercise care when navigating in this area as many of the associated structures and installations are often moved and are not charted.

4.25 Kuito Oil Terminal (5˚28'S., 11˚30'E.) lies about 10 miles S of N'Kossa Oil Field. Vessels should send an ETA 7 days, 72 hours, 48 hours, and 24 hours in advance through Luanda Radio (D3E). Vessels should then contact the terminal by VHF when within range, giving the following information:

1. Vessel name.
2. ETA.
3. Master's name.

4. Any information as requested.

Pilots board about 3 miles NW of the terminal. Vessels can wait in the waiting area, best seen on the chart, lying about 10 miles SW of the terminal. The terminal is surrounded by a restricted area.

The Riviere Massabi to the Congo River

4.26 Between the Riviere Massabi and the mouth of the Congo River, 62 miles SSE, the prevailing nature of the bottom near the coast and in depths of up to 20m is mud. Farther offshore, the bottom consists of gray muddy sand, sand and gravel, and sand mixed with coral. The latter is more general in the mouth of the Congo River.

A dangerous wreck, consisting of a former drilling platform, lies 11.5 miles SW of the mouth of the Riviere Massabi

Caution.—An extensive area, where offshore exploration and production operations are in progress, extends up to about 40 miles offshore between the mouth of the Riviere Massabi and the mouth of the Congo River. Numerous drilling rigs, platforms, submarine pipelines, and wellheads may be encountered. Vessels should exercise care when navigating in this area as many of the associated structures and installations are often moved and are not charted.

4.27 **Takula Oil Field** (5˚15'S., 11˚50'E.) lies 17 miles SW of the mouth of the Riviere Massabi and consists of several platforms, some with prominent flares. Wamba Oil Field lies adjacent to the N side of this field, while Banzala Oil Field and Numbi Oil Field lie about 6 miles NE and 6 miles SE, respectively, of it.

Takula Oil Terminal (5˚13'S., 11˚47'E.) lies at the NW side of the oil field. It consists of an SBM which is moored in a depth of 70m and can handle vessels of up to 300,000 dwt. Pilotage is compulsory. Pilots, who act mooring masters, can be contacted by VHF and board about 1.5 miles NW of the SBM. Vessels should send an ETA 72 hours, 48 hours, and 24 hours in advance, giving the following information:

1. Vessel name.
2. ETA in GMT.
3. Master's name.
4. Estimated arrival draft, for and aft, and displacement.
5. Time for discharge of clean ballast, if any, and quantity of segregated ballast on board.
6. Whether vessel is proceeding to another port first and any expected delays.
7. Quantity of cargo required and any special requirements.

Caution.—A restricted area, which may best be seen on the chart, encloses the above oil fields and terminal. Vessels not proceeding to or from the terminal or the fields are prohibited from entering this area.

4.28 The **Rio Chiloango** (5˚12'S., 12˚08'E.), with its mouth lying 12 miles SSE of the the Riviere Massabi, is indicated by several red hills which fall steeply to the beach. Discoloration of the sea has been observed up to about 7 miles seaward of the entrance to this river. The bar fronting the river entrance can be crossed by small vessels with local knowledge, but it is dangerous because of the surf.

The coast between the Riviere Massabi and the Rio Chiloango rises to moderately high hills. A ridge of hills extends S from the vicinity of the Rio Chiloango to the mouth of the Congo River. It stands between 5 and 8 miles inland and attains heights of 120 to 156m.

Ponta Cacongo (Ponta de Landana) (5˚14'S., 12˚07'E.) is located 2.5 miles S of the mouth of the Rio Chiloango. It is conspicuous and presents a bold and bluff appearance. A light is shown from a tower with a dwelling, 9m high, standing on the point. A hospital, with a red roof, is situated 0.5 mile NNE of the light.

Baia de Cacongo (Enseada Landana) (5˚14'S., 12˚09'E.) lies between the mouth of the the Rio Chiloango and Ponta Cacongo. The village of Cacongo (Landana) (Vila Guilherme Capelo) is situated at the head of this bay. A conspicuous administration building, with a flagstaff, stands on a bluff close S of the village. Cargo can be worked at the roadstead by lighters, but this bay is little frequented as the anchorage is poor, a considerable distance offshore, and subject to bad swells. Small vessels with local knowledge can anchor, in a depth of 9m, mud, about 3 miles W of the administration building. The bottom is rocky in depths of less than 5m.

4.29 **Ponta de Malembo** (5˚20'S., 12˚10'E.) is located 5.6 miles SSE of Ponta Cacongo. It lies at the S end of Baia de Malembo and consists of a grassy tongue of land extending NNW from the base of several abrupt and red chalky cliffs. These cliffs, which are surmounted by vegetation, line the coast to the N and S of the bay and are about 30m high. They assist in identifying the bay, which is reported to be difficult to distinguish from offshore.

A narrow rocky shoal, with depths of less than 5m, extends up to about 1 mile NW of Ponta de Malembo.

The village of Malembo is situated 1 mile SE of Ponta de Malembo; a prominent water tower stands in its S part. Another prominent water tower surmounts the red cliffs, 1 mile ENE of the point. Large vessels usually anchor, in a depth of 11m, well to the N of the bay and NW of Ponta de Malembo. Small craft can anchor within the bay, but are exposed to the heavy swell. Rollers are also frequent and heavy. They occur, more often than not, during calms.

Caution.—Vessels without local knowledge are advised not to approach the coast between Baia de Cacongo and Baia de Malembo in depths of less than 11m.

Baia de Malembo lies within a restricted area. Vessels should receive permission from the authorities prior to anchoring within this area.

4.30 **Malongo Oil and Gas Field** (5˚24'S., 12˚04'E.) lies between Ponta de Malembo and Ponta de Tafe, 15 miles S. This field extends up to 13 miles offshore and may best be seen on the chart. It consists of Malongo North Field, Malongo South Field, Malongo West Field, Limba Field, Kali Field, Lifuma Field, Kungulo Field, and Vuko Field. Numerous rigs, platforms, wells, submarine pipelines, and flares exist within these fields, but are not charted.

Platform Juliet (5˚25'S., 11˚59'E.), which is situated 12.5 miles W of Malongo, is equipped with a racon; a prominent flare burns on a platform standing close W of it.

4.31 Malongo (5˚26'S., 12˚05'E.) (World Port Index No. 46475), a submarine pipeline landing terminal, is situated 4 miles SSE of Ponta de Malembo. A prominent tank farm and a flare are situated near the shore and are fronted by an L-shaped jetty. This jetty, 342m long, is used by small coasters and oil production service vessels, but is subject to a heavy swell. A lighted range, which may best be seen on the chart, is situated in the vicinity of the tank farm. A radio tower, 125m high, is reported (1991) to stand about 0.5 mile SE of the rear range structure.

4.32 Malongo Terminal (Cabinda Terminal) (5˚26'S., 12˚05'E.) consists of an oil-loading facility and an LPG-loading facility.

The oil-loading facility consists of two SBMs. Malongo SBM No. 1 is moored in a depth of 22.8m, about 6 miles ESE of Platform Juliet. It can accommodate vessels of up to 140,000 dwt and 16.8m draft. Malongo SBM No. 2 is moored in a depth of 30.5m, about 3.5 miles SE of Platform Juliet. It can accommodate vessels of up to 325,000 dwt and 350m in length.

The LPG-loading facility lies 1.5 miles E of Platform Juliet and consists of a 55,000 dwt storage vessel. This storage vessel is secured to an SBM which is moored in a depth of 30.5m. Vessels of up to 40,000 dwt can be accommodated alongside the storage vessel.

Winds—Weather.—During the rainy season, from the middle of October to the end of April, local thunderstorms may be experienced, particularly from December onwards. These thunderstorms are usually accompanied by heavy rains, which last up to 3 or 4 hours, and occasionally by sudden squalls with winds of up to 75 knots. Generally, the winds are mostly from the S and at less than 20 knots. During the dry season, a long SW swell affects this area and may exceed 4.5m in height.

Tides—Currents.—In the vicinity of the anchorage area, the current generally sets between NW and NNW. It sometimes exceeds 3 knots, being affected by the outflow from the Congo River. In the dry season, a SSW current can be experienced.

Pilotage.—Pilotage is compulsory. Pilots, who act as mooring masters, can be contacted by VHF and board in the vicinity of the anchorage area located 1.5 miles WSW of SBM No. 2.

Regulations.—Vessels should send an ETA 7 days, 72 hours, 48 hours, and 24 hours in advance through Luanda Radio (D3E). Vessels should then contact the terminal by VHF when within range, giving the following information:

1. Vessel name.
2. ETA.
3. Master's name.
4. Any information as requested.

Berthing is done during daylight hours only; unberthing can be done at any time.

Anchorage.—All vessels awaiting a pilot or a berth should anchor in a designated area, with depths of 38 to 40m, lying about 4 miles WSW of Platform Juliet.

Caution.—Due to drilling operations and the existence of new production platforms and submarine pipelines, the position of the designated anchorage area may vary.

A restricted area, which may best be seen on the chart, encloses the loading facilities and terminals. Vessels not proceeding to or from these facilities or terminals are prohibited from entering this area.

4.33 Praia de Futila (5˚26'S., 12˚13'E.), a village, stands 3.5 miles SSE of Malongo. The coast in this vicinity is formed by a broad, low plain which is studded with palm trees.

A bank of sand and rock, with depths of less than 5m, fronts this village and extends up to about 1.5 miles offshore. This bank also fronts the coast to the S and extends up to about 3 miles seaward from the head of Baia de Cabinda. Shoal depths of less than 5m lie on the outer edge of this bank, but the sea does not usually break on it. Vessels without local knowledge are advised to give this stretch of coast a wide berth.

Futila Oil Terminal (5˚27'S., 12˚11'E.) lies 2.5 miles SW of Praia de Futila and consists of four mooring buoys in a depth of 6.7m. A submarine pipeline leads NE and connects the terminal to the shore. Vessels of up to 6,400 dwt, with a maximum draft of 4.6m, can be accommodated. The vessel's ETA should be sent via the agent 72 hours, 48 hours, and 24 hours in advance. Vessels moor during daylight hours only, in normal weather conditions, and with the permission of the mooring master. The mooring master boards in the Malongo Terminal anchorage.

Kokonga Oil Field (5˚36'S., 11˚42'E.), consisting of two production platforms, lies about 21 miles SW of **Platform Juliet** (5˚25'S., 11˚59'E.). A restricted area surrounds the platforms, as shown on the chart. A submarine pipeline connects the platform to the shore at Malonga.

4.34 Ponta de Tafe (5˚33'S., 12˚11'E.), marked by a light, is low and covered by bushes. It is located 9.5 mile S of Malongo and forms the SW entrance point of Baia da Cabinda. A prominent monument surmounts a cliff, 0.5 mile SSW of the point, and a radio mast stands 1 mile S of it.

Several rocks, on which the sea breaks, front this point and the coastal bank, with depths of less than 5m, extends up to about 2 miles WSW of it.

Baia de Cabinda (5˚32'S., 12˚12'E.) (World Port Index No. 46490) lies E of Ponta de Tafe and is mostly encumbered by the coastal bank. Baixo do Bele, a rocky shoal, lies in the middle of the bay. It has a least depth of 2.5m and is located 2 miles NNE of Ponta de Tafe.

The head of the bay consists of a sandy beach backed by lofty cliffs, green hills, and deep valleys. The town of Cabinda is situated 0.7 mile E of Ponta de Tafe and is hidden by the trees which stand on the sides and summit of an area of elevated land. A prominent three-story structure stands in the town, 1 mile SE of Ponta de Tafe. It was originally used as a lighthouse, but is now a clock tower. An airfield is situated on the SE side of the town.

Several factories stand along the bay and an L-shaped pier fronts the shore, 0.5 mile E of Ponta de Tafe.

Vessels may anchor, in a depth of 9m, mud, about 2.3 miles WNW of Ponta de Tafe or closer inshore according to their draft. Small vessels with light drafts may anchor, in a depth of 4.6m, about 0.4 mile N of the head of the L-shaped pier. A lighted range, which may best be seen on the chart, indicates this inner roadstead.

It was reported (1994) that a designated freighter anchorage area, with depths of 10 to 11m, lies about 3.5 miles NW of Ponta de Tafe.

Caution.—Several dangerous wrecks lie in the approaches to Baia de Cabinda and may best be seen on the chart.

4.35 Between Ponta de Tafe and the entrance to the Congo River, 30 miles SSE, the country is particularly fertile and well-populated. Numerous fishing canoes may be encountered close off the coast.

A prominent radio tower stands close to the shore, 5 miles SSW of Ponta de Tafe.

The coast between Ponta de Tafe and Ponta Vermelha, 7 miles SSW, is fronted by a shoal bank which extends up to about 1.5 miles offshore and is generally indicated in places by breakers. Vessels should not approach this stretch of the coast within depths of less than 22m, as rollers have been known to break in depths of 13m and up to about 5 miles offshore.

The shore extending to 4 miles SSE of Ponta Vermelha is low and fringed with forests. A chain of reddish-colored hills, with nearly uniform height, rises close inland 3 miles S of Cabinda and extends almost to the N bank of the Congo River.

Three beacons are situated about 8 miles SSE of Pointe Vermelha and mark the boundary between Angola (Cabinda) and Zaire.

Pointe Kipundji (Kupundji) (5˚53'S., 12˚18'E.) is located 17 miles SE of Pointe Vermelha. The shore between is fringed by a narrow, sandy beach. A light is shown from a metal tower, 9m high, standing at Pointe Kipundji and the conspicuous village of Vista (Nsiamfumu), consisting of 30 houses, stands 1 mile NW of it. The village of Muanda (Moanda), with an airfield, is situated 4 miles SE of Pointe Kipundji.

Mona Mazea Bank (Banc Mona Mazea), an extensive shoal, fronts the coast between a point located 5 miles SSE of Ponta Vermelha and the entrance to the Congo River. This shoal has depths of less than 5m and extends up to about 5.5 miles offshore in places. Vessels are advised to avoid this shoal bank and remain in depths of over 10m, as a constant swell, frequent rollers, and a strong current from the river are frequently experienced in this vicinity.

Kambala Terminal (5˚44'S., 12˚05'E.), consisting of several platforms, lies 6.5 miles SW of Ponta Vermelha. A submarine pipeline leads NE and connects this terminal to the shore.

Livuite Oil Field, with two platforms, is situated 2.5 miles SW of the terminal. Livuite Gas Field, with two platforms, is situated 4 miles W of the terminal. Several submarine pipelines, which may best be seen on the chart, lie in the vicinity of these facilities.

A submarine pipeline connects Kambala Terminal with Malongo Oil and Gas Field, 14 miles N.

N'Dola Oil Field (5˚45'S., 11˚49'E.), consisting of several wellheads, lies 17 miles W of Kambala Terminal.

4.36 Moanda Oil Terminal (Muanda Oil Terminal) (5˚55'S., 12˚12'E.) extends up to about 13 miles W and 6.5 miles S of Pointe Kipundji. It consists of numerous platforms and submarine pipelines and may best be seen on the chart.

Tides—Currents.—The current at the terminal usually sets NW and attains a rate of 3 to 4 knots. It is modified by the tidal currents and greatly affected by the flow of water from the Congo River. When the water level in the river is high, the current experienced at the terminal may attain a rate of 7 knots. A heavy swell is also often experienced at the terminal between March and September.

Depths—Limitations.—The terminal loading facility, situated 10 miles SW of Pointe Kipundji, consists of an SBM and a 95,000 dwt storage tanker, moored in a depth of 21.9m. Vessels of 60,000 to 100,000 dwt and up to 15.2m draft can be accommodated. Vessels can anchor, in a depth of 28m, soft mud, about 2 miles NW of the SBM.

Pilotage.—Pilotage is compulsory. Pilots, who act as mooring masters, can be contacted by VHF and board in the vicinity of the anchorage area or 3 miles NW of the storage tanker. Vessels can berth only during daylight hours, but may leave at any time.

Regulations.—Vessels should send an ETA 72 hours, 48 hours, and 24 hours before arrival. The ETA messages should include the following information:

1. Vessel name.
2. ETA.
3. Master's name.
4. Arrival draft, fore and aft, and displacement.
5. Time for discharging clean ballast, if any.
6. Whether vessel is proceeding to any ports prior to arrival at the terminal and the expected delay.

Caution.—A restricted area, which may best be seen on the chart, encloses the terminal. Vessels not proceeding to or from the terminal or adjacent fields are prohibited from entering or anchoring within this area.

The Congo River (Flueve Zaire)

4.37 The Congo River (Flueve Zaire), the second largest river in Africa, is over 2,700 miles long and is the fifth longest river in the world. However, in volume of water, depending on the season, it is second only to that of the Amazon. The Congo River is navigable by ocean-going vessels as far as Matadi, about 80 miles from the sea.

Above Matadi, the Congo River runs at rates of up to 10 knots between the cliffs. The water is generally deep, but whirlpools render navigation difficult. Rapids are located about 3.5 miles and 6.5 miles upriver from Matadi.

Inga Dam (5˚30'S., 13˚37'E.) is situated about 21 nautical miles above Matadi. It was built across a once dry valley. Rapids are located at regular intervals upriver between Inga Dam and **Kinshasa** (4˚20'S., 15˚19'E.). This latter town stands on the S side of the river, at the SW end of Pool Malebo, an extensive lake. Brazzaville is situated on the N bank, opposite Kinshasa. Pool Malebo is about 14 miles long and 11 miles wide.

The river between Pool Malebo and the town of **Kisangani** (0˚31'N., 25˚12'E.), about 940 miles upstream, is navigable by river craft of up to 800 dwt. Stanley Falls are located opposite the E end of Kisangani. Between Kisangani and **Bukama** (9˚13'S., 25˚51'E.), there are many areas of rapids, rivers, and swamp. The river source lies about 382 miles upstream from Bukama. Two dams have been built on this stretch of the river and it is not used as a means of transportation.

The boundary between Zaire and Angola lies, in the lower part, in the vicinity of the middle of the river.

Tides—Currents.—The lower part of the Congo River is well-supplied with water throughout the year, since the tributaries of this river are distributed on both sides of the Equator. The levels of the river system are usually either rising or falling and seldom remain at their mean level for any length of time. The tributaries of the left bank, on the S side, have two periods of high level and two periods of low level during the year. Those of the right bank, on the N side, have only one period of high level and one period of low level in the course of the year. The river is low in March and July, and high in May and December. The July low level is usually lower than that in March. The mean river level at Matadi is about 26m above mean sea level.

The difference between the high river level and the low river level at the following places are, as follows:

1. Banana (6˚02'S., 12˚25'E.)—0.6m.
2. Mateba (25 miles above Banana)—1.5m.
3. Pedra do Feitico (10 miles above Mateba)—2.1m.
4. Boma (7 miles above Pedra do Feitico)—2.7m.
5. Matadi—7m.

At Boma, the tidal influence is perceptible, but the range is less than 0.3m. At Matadi, the tidal influence is reported to be almost not perceptible, being about 0.1m.

The river current always runs seaward. During the rainy season, this current is very rapid and usually carries along with it floating islands of papyrus and water hyacinths which have been torn away from the banks. Some of these floating islands may be more than 100m long and may be dangerous to vessels underway or at anchor. In addition, they frequently sweep away the buoys marking the channels. These floating islands may also be encountered during the low river season, but they are usually not of sufficient size to be dangerous.

Currents in the Congo River

Location	High River Level	Low River Level
Banana to Boma	3 to 4.7 knots	2 to 3.5 knots
Boma to Matadi	7 knots	6 knots
Chaudron d'Enfer	10 to 11 knots	6 knots
Rade de Matadi	7.5 knots	—

Observations indicate that the fresh water of the river, extending from the surface to the bottom, is found until just below **Quissanga** (6˚02'S., 12˚39'E.), where a body of salt water is encountered in a deep gully. The fresh water then flows over the denser water with decreasing depth and increasing velocity. It also decreases in depth as the estuary widens, but is deeper on the ebb current than on the flood current.

About 5 miles below Quissanga, the layer of fresh water extends from 5.5 to 9.1m below the surface, whereas after passing **Pointe Bulabemba** (6˚03'S., 12˚26'E.), it is only about 1m in depth. The deep body of salt water is reported to be either perfectly still or to have a very slight tidal flow.

In the Congo River, the nature of the bottom is invariably sand, but hard clay may be found in a few places. The exception is within the deep gully lying at the mouth of the river, where deposits of soft mud and decayed vegetable matter are found. The latter is proof of the tranquillity of the water near the bottom.

Mud is found within the small creeks in the upper part of the river and also on the mangrove-covered banks extending downriver from Quissanga. The water of the river is heavily charged with sand and it would appear that a very large proportion of the mud found in the deep gully at the mouth is from the washings of the immediate neighborhood.

Depths—Limitations.—Depths of over 100m extend into the mouth of the river and may be found in the channel up to the vicinity of Lighted Buoy No. 16 (6˚02'S., 12˚34'E.). The Zairian authorities endeavor to maintain a depth of 9.1m throughout the year by surveying and dredging in the sandy passes of the wandering portion of the river below Boma. However, sometimes this depth cannot be maintained due to the break-up of banks or intensive shifting of sands. These periods are relatively short and every effort is made to reestablish a depth of 9.1m as soon as possible.

The controlling depths in the river vary. It is reported (1995) that, due to the sandbanks lying between Banana and Boma, vessels with drafts of 6.4 to 8.5m are permitted to make the river transit, depending on the season. The authorities should be contacted in advance for the latest depth information.

Aspect.—The estuary of the Congo River is entered between **Ponta Vermelha** (5˚39'S., 12˚08'E.) and **Ponta da Moita Seca** (6˚07'S., 12˚16'E.), 29 miles SSE, and extends about 50 miles inland to Boma. The continental shelf, with depths of less than 200m, extends up to about 40 miles W of this estuary. It is cut by a remarkable deep gully, 2 to 8 miles wide, which has depths of over 1,400m at the outer end. This gully, which has steep and irregular sides, leads directly into the entrance of the Congo River. It is useful when approaching the entrance in foul weather, as depths of over 200m extend into the river mouth.

Presqu'ile de Banana (6˚01'S., 12˚24'E.), located 26 miles SE of Ponta Vermelha, is a low and narrow peninsula. This sandy peninsula extends 2.5 miles S to Pointe Francaise, its S extremity. Several prominent white buildings of the town of Banana are situated on the peninsula and two conspicuous radio masts stand 1.2 miles N of Pointe Francaise. The prominent flare of an oil refinery is situated about 2.5 miles NNE of the radio masts. When rollers occur along this part of the coast at the time of the equinoctial tides, the greater part of this peninsula is submerged.

This part of the coast is fronted by a continuation of Mona Mazea Bank and depths of less than 5m lie up to 2 miles offshore. Banc Stella, a sandbank, extends up to about 0.5 mile S of Pointe Francaise. Its S edge is steep-to, but depths of less than 5m lie up to 1.5 miles W of the point. This bank was reported (1990) to be extending to the W and vessels should exercise caution when navigating in its vicinity.

Stella Lighted Buoy No. 2 is moored about 1.8 miles WSW of Pointe Francaise.

Pointe Bulabemba (6˚03'S., 12˚26'E.), a low point, is located 2.7 miles SE of Pointe Francaise and is marked by a light.

Kizomba A Oil Field (6˚19'S., 11˚03'.), lying about 73 miles W of Ponta da Moita Seca was under development 2003. It has a 4 mile square restricted area around it. Mariners should give thi area a wide berth.

Ponta da Moita Seca (6˚07'S., 12˚17'E.) is of moderate height and appears as a steep cliff when seen from the N at a distance of about 7 miles. It is surmounted by a mound which

is covered by stunted bushes. A light is shown from a metal framework tower, 21m high, standing on the point.

A stranded wreck is reported (2000) to lie about 1 mile NE of the point.

Ponta da Moita Seca Light from W

Ponta Padrao (Ponta do Padrao) (6˚04'S., 12˚20'E.), located 4 miles ENE of Ponta da Moita Seca, is the NE extremity of a long and low peninsula. A light is shown from a framework tower, 7m high, standing on this point. The framework tower is mounted on a carriage which enables it, when necessary, to be moved away from the heavy erosions of the river.

A village stands on Ponta Padrao; an old cemetery is situated about 0.3 mile within the point. A prominent marble column, 5m high, stands near the extremity of the point. It was set up by the famous Portuguese navigator Diego Cam in 1486.

Baia de Diogo Cao lies on the S side of the entrance to the Congo River and is entered E of Ponta Padrao. It is mostly shallow and not recommended as an anchorage. A lighted buoy is moored about 2.5 miles ESE of Ponta Padrao and anchorage can be taken, in depths of 7 to 9m, about 0.2 mile N of it.

A channel leads SSW for 3 miles along the W side of Baia de Diogo Cao to the town of Kwanda. It has a dredged depth of 6m over a width of 80m and is marked by buoys. The town is fronted by two quays, each 200m long, with depths of 5 to 6m alongside. They are mostly used by vessels servicing the offshore oil and gas installations and by fishing craft.

Canal de Soyo (Canal de Santo Antonio) (6˚07'S., 12˚22'E.), a creek, flows into the bay, 2.5 miles E of Kwanda; the town of Soyo (Santo Antonio do Zaire) stands on the SW side of the entrance. The channel leading into Canal de Soyo is marked by buoys and beacons and indicated by a lighted range. A conspicuous radio tower, 45m high, stands in the town and is the tallest of four towers. A small wharf fronts the town and can accommodate small vessels and ferries with drafts up to 4m. Small craft with drafts up to 1.2m can ascend the creek.

Sazaire Oil Terminal, consisting of a lighted tower, lies about 1 mile offshore, 3.7 miles ESE of Ponta Padrao. A submarine pipeline extends SSE from the terminal to the shore. This terminal is used by small local tankers and barges which transfer oil to larger vessels anchored in the vicinity of Ponta Padrao.

Pilotage.—Pilotage is compulsory for all vessels over 500 grt. Pilots for the river, Boma, Ango-Ango, and Matadi are provided from the station at Banana. They can be contacted by VHF and board between Stella Lighted Buoy No. 2 and Pointe Bulabemba or in the vicinity of Lighted Buoy No. 16 (6˚02'S., 12˚34'E.).

Vessels should send an ETA 5 days in advance, if possible, and a confirmation message 24 hours before arrival through Banana (9PA) radio station. Pilotage is available by day only; this may result in vessels having to anchor at Boma or Ango-Ango overnight if there is insufficient time for them to reach Matadi during daylight.

Regulations.—For the safety of navigation, vessels proceeding to Matadi must be capable of speeds of 10.5 to 11 knots, and sometimes of speeds greater than 12 knots, depending on the season and prevailing local conditions.

Anchorage.—Vessels awaiting daylight to enter the river can find good anchorage, out of the current, in depths of 13 to 17m, between 1 and 5 miles W of Ponta da Moita Seca. Another anchorage frequently used is in depths of 8 to 18m, on the edge of the bank, between 2 and 2.8 miles WSW of Pointe Francaise.

Good anchorage may also be obtained, in a depth of 14m about 1 mile WSW of Ponta Padrao. The surface current at this anchorage has been reported to set continually W, slackening only on the flood tide.

Caution.—The great difference between the rates of the surface currents and undercurrents in the estuary of the Congo River accounts for the often reported difficulties in steering. Vessels proceeding with good speed, either directly with or against the surface current are not so much affected. However, vessels proceeding at a slow speed and broadside to the current may, at times, become almost unmanageable.

Vessels grounding on the banks where the current is strong have observed the sand to pile up against one side nearly to the surface of the water in a few hours. However, a sudden swirl of the current has then washed all the sand away and the vessel has been left in deep water.

It is stated by one local authority that, on grounding, the anchor should never be dropped, as sooner or later, the current will wash the vessel, along with part of the bank, down the river and into deep water. However, another local opinion is that the above statement is open to question, depending upon the position of the grounded vessel in relation to the bank. Consideration of the action to be taken is therefore necessary in each case.

The charts of the river should be used with care, as considerable changes in the configuration of the islands and river banks may have taken place since the last surveys. The channels are constantly changing, especially during the wet season, and at times new islands are formed and old ones swept away by the violence of the current.

Navigation aids are reported to be frequently moved, damaged, or missing, especially above Lighted Buoy No. 24. Local knowledge is necessary. The channel buoys are often towed under by the current or are swept away altogether by the floating islands and debris which flow down the river during the wet season.

Vessels are advised to give Ponta Padrao a berth of at least 1 mil,e as depths in its vicinity have been reported (1972) to be less than charted.

Vessels should head E to approach the river entrance, but allowance must be made for the strong current which sets N or NW. In addition, vessels should exercise care in order not to be set onto the shoal bank extending W from Pointe Francaise.

Offshore oil and gas exploration and production operations are being carried out in the vicinity of the approaches to the river. Drilling rigs, platforms, submarine pipelines, and well heads may be encountered. Vessels should exercise care when navigating in the approaches as many of the associated structures and installations are often moved and are not charted.

4.38 Banana to Boma.—Banana (6˚01'S., 12˚24'E.) (World Port Index No. 46510), the site of the pilot station, lies within Crique de Banana, which is entered between Pointe Francaise and Pointe des Pecheurs, 0.4 mile E. An oil refinery, with a prominent flare, is situated close NE of the town which stands on Presqu'ile de Banana. A channel, marked by buoys, leads N into the creek. The bar at the entrance to this channel has a depth of 5.5m at LW. The town is fronted by a quay, 75m long, which has a depth of 5.2m alongside. Vessels can anchor in the middle of the creek, about 0.5 mile N of Pointe Francaise. The creek is subject to strong tidal currents, but boats can ascend up to about 15 miles within it.

Vessels with drafts too deep to enter this creek can anchor to the E of Pointe Bulabemba, between Lighted Bouy No. 12 and Lighted Bouy No. 14, and work cargo from barges.

Tankers of up to 220m in length and 11m fresh water draft can anchor E of Pointe Bulabemba, between Lighted Bouy No. 12 and Lighted Bouy No. 16. Cargo operations are carried out continuously by large tanker barges. The current in the vicinity of this roadstead sets seaward at 4 to 5 knots. It is reported that the pilots consider the best and safest anchorage to be near Lighted Bouy No. 16, but the transit time for barges is considerably longer and delays may result. During the wet season, the current may increase and vessels should have their engines available at all times. Pilots are not always available for this anchorage, but experienced officers from the oil refinery will assist vessels in berthing, if requested. Vessels generally depart without the services of a pilot.

A detailed description of the islands and banks of the river cannot be provided, as the channels are constantly changing, especially during the wet season which starts in October.

4.39 Between **Pointe Bulabemba** (6˚03'S., 12˚26'E.) and Ponta da Quissanga, 13 miles ENE, the banks of the river are formed by alluvial deposits and are covered with a dense growth of palms and giant mangroves. Some of the latter vegetation grows to considerable size. One species reaches heights of over 30m and has a straight stem which is supported by an arch of roots rising up to 6m from the ground. The spaces between these giant mangroves are usually filled by various smaller trees.

The countryside near the river is low and swampy, but low ranges of hills rise some distance inland on either side. The hills are 60 to 150m high and are covered with grass and occasional patches of trees.

Canal do Porto Rico, entered 4 miles SE of Pointe Bulabemba, is obstructed by sandbanks and a shallow bar fronts its entrance. The settlement of Cafumbila is situated 1.5 miles ENE of the entrance.

Quissanga Light (6˚02'S., 12˚37'E.) is shown from a structure, 8m high, standing on the N side of Ilha da Quissanga, 1.5 miles NE of the W end of the island. Ponta da Quissanga is located at the NE end of Ilha da Quissanga. The countryside in this vicinity consists of one huge swamp which is intersected by numerous creeks. Giant mangroves stand on the banks of these creeks. Above Ponta Quissanga, this dense vegetation tends to disappear and its place is taken by low banks of coarse hippopotamus grass.

Anchorage.—Anchorage can be taken, in a depth of 11m, to the W of the entrance to Canal do Porto Rico. However, care should be taken as depths of 9m lie close inshore of this roadstead and the bottom shoals very rapidly. A strong current sets at this anchorage and rough water is often experienced when the afternoon sea breeze is blowing, but not as much as on the N side of the river. Anchorage can also be taken, in a depth of 11m, off the settlement of Cafumbila. It was reported (1973) that these two anchorages were unsatisfactory.

Above Ponta da Quissanga, the Congo River widens and is obstructed by numerous islands and banks. Several channels lead between these obstructions, but only one main fairway is kept open for shipping by dredging. The islands are low and covered with grass and bushes which are almost level with the water. They are intersected by creeks and fringed by drying banks. Crocodiles are particularly numerous in this part of the river and grow up to 9m in length.

4.40 Pedra do Feitco (5˚55'S., 12˚58'E.), formed by the termination of a ridge of ironstone, projects boldly into the river from the edge of a grassy plain. A shallow rock lies about 200m N of the point. The village of Quissacala, with an airfield, is situated 1 mile S of the point.

It is reported (1995) that a military tower stands near the point.

Between Pedra do Feitco and Ile des Princes, 9 miles ENE, the character of the countryside changes. The low, swampy land is replaced by hills, some of which rise to heights of over 150m.

After passing Pedra do Feitco, a very strong current, with numerous eddies and whirlpools, is often experienced. Vessels tend to be set away from the S side of the river due to the volume of water flowing W through the channel leading S of Ile Selonga.

Several lighted ranges indicate the fairway in this part of the river. Ile Selonga (5˚53'N., 13˚02'E.) is low and grassy. Ile Sacra Ambaka (Mebaca), lying close E of Ile Selonga, is only just above the level of the river, except near its NE end, which is surmounted by a wooded hill, 74m high. A 2,000m measured distance lies N of these two islands and is indicated by three pairs of beacons. It was reported (1982) that most of these beacons were missing.

Fingal's Shield, a conspicuous granite monolith, stands near the summit of a hill, 150m high, which rises 2.3 miles NW of the W end of Ile Selonga.

Fort Shinkakasa, situated 2 miles E of Fingal's Shield, stands 41m above the river. Large pythons are frequently found in this vicinity. The town of Boma stands 1 mile E of this fort.

4.41 Boma (5˚51'S., 13˚03'E.) (World Port Index No. 46520) lies on the N side of the Congo River, 50 miles above the river mouth. The town stands in the center of a semicircle of hills and consists of two sections. The business section is situated on the flat ground, close to the river. The residential section is situated about 60m above the river and includes official residences, hospitals, barrack buildings, etc.

Depths—Limitations.—A main quay, 480m long, provides three general cargo and bulk berths and has depths of 7.9 to 9.1m alongside. A current, with a maximum rate of 3 knots, is normally experienced at this quay.

The controlling depths in the river vary and vessels should ascertain the latest information from the authorities. Vessels with drafts of 6.4 to 8.5m draft can transit the river to this port, depending on the season.

Vessels can also anchor off the N side of Ile Sacra Ambaka (Mebaca) in good holding ground. Vessels can load or discharge cargo if necessary with the use of barges.

4.42 Boma to Matadi.—Ile Rocca (5˚53'S., 13˚05'E.), lying E of Ile Sacra Ambaka (Mebaca), rises near its E end to a rocky and wooded hill, 87m high. A shoal extends N from this island and is the only danger lying between Boma and **Ile des Princes** (5˚53'S., 13˚07'E.). Several lighted ranges indicate the fairway in this part of the river channel.

Above Ile des Princes, the character of the scenery undergoes a change. The river, previously broad and uninteresting, is now confined within narrower limits by high hills on either side. These hills are covered with luxuriant vegetation for some distance.

Although the currents and eddies are stronger in this part of the river than in the lower part, vessels with good speed can reach Matadi without much difficulty.

The S bank of the river between **Ponta Bumbu** (5˚53'S., 13˚10'E.) and Sango-Bongo rises steeply to hills, 60 to 90m high. Vegetation lies at the foot of these hills, which are generally bare, but a few trees may be seen on the skyline.

Binda (5˚51'S., 13˚14'E.), a town, stands on the N bank of the river, close W of the mouth of the Riviere Belizi. Ponta Senga is located on the S side of the river, about 2 miles ESE of the town.

Ilot Oscar (5˚53'S., 13˚18'E.) lies in the middle of the river, 2 miles ESE of Ponta Senga. It is wooded and marked by a light. The main channel passes to the S of this islet. It was reported (1982) that the islet was below-water, but the light structure remained visible.

Sango-Bongo (5˚54'S., 13˚19'E.) lies in the middle of the river, about 1.7 miles ESE of Ilot Oscar. This rock is marked by a light and dries 0.6m during the dry season. The main channel passes to the N of it.

Ponta Tridente (5˚54'S., 13˚20'E.), marked by a light, projects from the S side of the river, 1 mile ESE of Sango-Bongo. Les Trois Soeurs, a group of three islets, lies on the N side of the river, opposite this point, and narrows the channel to a width of about 600m. It was reported (1982) that the southernmost islet of the group was below-water.

4.43 Pointe Muzuku (5˚54'S., 13˚22'E.) is located on the N bank of the river, 1.5 miles E of Ponta Tridente. On the S side of the river, opposite this point, the land rises to several hills which stand 2 to 3 miles inland. These hills are about 300m high and covered with dense vegetation. The intervening countryside is very rough with isolated hills and ridges.

Three small islets lie in the center of the river, E and NE of Pointe Muzuku; a light is shown from the middle islet. Shoal water lies between these islets and the NW bank of the river. Ilot Kongolo lies about 0.2 mile offshore, 1 mile NNE of Pointe Muzuku. A shelf, with depths of less than 5m, extends along the NW bank of the river in the vicinity of this islet.

Ponta Diamants (5˚52'S., 13˚23'E.) is fronted by Rocha Diamants, a dangerous rocky shoal, which covers at HW. A lighted beacon is situated 0.2 mile NW of this point.

Pointe Luze is located on the N bank of the river, 0.7 mile NE of Ponta Diamants; the town of Ikungulu stands 1 mile E of it.

The town of Noqui is situated on the S side of the river, 2.6 miles E of Pointa Diamants. A light is shown from an elliptical tower on rocks, 2m high, standing on a point near this town. River ferries link Noqui with Soyo and Boma.

The boundary between Zaire and Angola lies close N of Noqui.

4.44 Ango-Ango (5˚50'S., 13˚26'E.) is situated on the SE side of the Congo River, 1.2 miles N of Noqui. It is used for the discharge of dangerous goods and by vessels not powerful enough to pass through Chaudron d'Enfer (Devil's Cauldron).

A floating pontoon, 61m long, fronts the SE side of the river. It is connected to the shore by two bridges and forms a berth with a depth of 9.1m alongside. Vessels of up to 8,000 dwt and 195m in length can be accommodated. A strong current is normally experienced at this berth. It has rates of 3 to 7 knots, depending on the height of the river. Palm oil can also be loaded at this berth, but oil tankers have priority for berthing. A pier, 150m long, is situated 0.7 mile S of the pontoon and is used for the discharge of dangerous cargo. It is reported that berthing at these facilities is permitted only during daylight hours and vessels must keep their engines available for immediate use.

Pointe Underhill (5˚50'S., 13˚26'E.) is located on the SE side of the river, 1.2 miles N of Ango-Ango and 1 mile W of Matadi. A telephone line, with a minimum vertical clearance of 40m, spans the river in the vicinity of this point.

It was reported (1995) that a road bridge spans the river at Pointe Underhill. It has a vertical clearance of 53m, which allows for a maximum rise of 8m in the river level, during the rainy season.

The high hills standing on the NW bank of the river, opposite Pointe Underhill, fall 183 to 244m in sheer precipices to the dark and gloomy basin below, which is known as Chaudron d'Enfer (Devil's Cauldron). The river in this vicinity is very deep and the currents are violent. Numerous eddies and heavy whirlpools necessitate special care in steering and a fast speed. Although the current is not very formidable during the dry season, it generally attains rates of 10 to 13 knots, in places, during the wet season.

The river pilots advise that steering for vessels of over 170m in length is extremely difficult within Chaudron d'Enfer and such vessels are almost unmanageable.

Anchorage.—Anchorage is reported to be possible in several places lying between Boma and Matadi. These places

are known to the river pilots and local knowledge is necessary. The anchorages are, as follows:

1. **Kinlele** (5˚52'S., 13˚06'E.), lying on the N side of the river, 2.5 miles above Boma.
2. **Iles des Princes** (5˚54'S., 13˚08'E.), lying off the SE side of the island.
3. **Bumbu** (5˚53'S., 13˚09'E.), lying between Ponta Kimongoa and Ponta Bumbu.
4. **Binda** (5˚51'S., 13˚14'E.).
5. To the N of **Ilot Oscar** (5˚53'S., 13˚18'E.)
6. **Muzuku** (5˚54'S., 13˚21'E.), lying on the N side of the river, 1 mile ESE of Les Trois Soeurs.
7. **Diamants** (5˚52'S., 13˚23'E.), lying on the N side of the river, opposite Ponta Diamants.
8. I**kungulu** (5˚52'S., 13˚25'E.), lying on the N side of the river, 1.5 miles W of Noqui. This anchorage is for vessels waiting to berth at Matadi.
9. Off **Ango-Ango** (5˚50'S., 13˚26'E.), in a depth of 15m.

Caution.—Between Sango-Bongo and Pointe Muzuku, exceptionally strong currents have been experienced.

In the past, vessels generally encountered no whirlpools of sufficient size to render steering difficult below Les Trois Soeurs. However, severe whirlpools were often encountered between Les Trois Soeurs and Matadi. A vessel of 1,320 dwt and 86m in length reported (1947) that it was best to use full helm at once to counteract the slightest tendency to swing, as, if even a small sheer were taken, the current tended to turn the vessel rapidly broadside to the channel.

A vessel of 25,000 dwt and 170m in length reported (1982) that while it was necessary to use the helm at once to counteract the slightest swing, full helm was neither necessary nor desirable, as this tended to overcorrect very quickly before the helm could be removed. The vessels also reported that the pilots preferred to use 10˚ or less helm in order to maintain a steady course.

4.45 **Matadi** (5˚49'S., 13˚27'E.) (World Port Index No. 46530) lies along the S bank of the Congo River, at the limit of navigation for ocean-going vessels, about 80 miles from the sea. The town is built on the steep and rocky slope of the river bank and is shut in on all sides by high mountains. It is extremely unhealthy in the hot season, although there are now few cases of malarial fever.

Winds—Weather.—Heavy thunderstorms and torrential rains occur during the wet season. Tornadoes are frequent. The prevailing winds are from the W.

Tides—Currents.—Matadi has no perceptible tidal rise, but a seasonal difference of 7m occurs between the high river water level andthe low river water level.

In the dry season, the current close inshore is weak. However, it runs strongly during the wet season and sometimes vessels experience considerable difficulty when berthing alongside. The rate of this current varies between 1 knot and 9 knots. At the most downstream part of the quay, the current is particularly strong and sets towards the berths. The current is felt the least at the center berths.

Depths—Limitations.—The port has 1,602m of total main quayage, which provides ten berths. These berths are 143 to 188m long and have depths of 7.9 to 9.8m alongside. Vessels of up to 24,800 dwt, 179m in length, and 8.2m draft can be accommodated. There are facilities for general cargo, bulk, container, and ro-ro vessels.

The controlling depths in the river vary and vessels should ascertain the latest information from the authorities. Vessels with drafts of 6.4 to 8.2m can transit the river, depending on the season.

Caution.—At the most downstream part of the quay, vessels must use care when dropping the anchor to assist in berthing, as deep water lies close alongside.

The Congo River to Luanda

4.46 The coast extending S for many miles from a point 3 miles S of **Ponta da Moita Seca** (6˚07'S., 12˚16'E.) consists of red cliffs. Inland of these cliffs, a tableland runs parallel to the coast in a continuous double line. This tableland is visible in places from offshore, but has no definite landmarks which can be identified.

An aeronautical light beacon is shown from a conspicuous mast standing about 9 miles SSE of Ponta da Moita Seca.

Caution.—Depths of less than 11m extend up to about 6 miles offshore between Ponta da Moita Seca and Nzeto (Ambrizete), 76 miles SSE. Vessels should exercise care when navigating in this area and keep in depths of over 15m. Rollers often form without warning and frequently break in depths of up to 9m.

Oil exploration and production are being carried out along this coastal area and vessels are warned that numerous platforms, submerged pipelines, and drilling rigs may be encountered. Vessels should exercise care when navigating in this vicinity as many of the associated structures and installations are often moved and are not charted. In addition, numerous well heads lie within the 100m curve, but are not considered a danger to surface navigation.

4.47 The **Rio Lombo** (6˚23'S., 12˚26'E.) enters the sea 19 miles SSE of Ponta da Moita Secca. A small oil terminal lies 1.5 miles offshore, 6.5 miles SSE of the mouth of this river, and is connected to the coast by a submarine pipeline.

Caution.—About 23 miles W of the Rio Lombo, an artificial reef is situated with its center a tposition 6˚38.7'S., 12˚07.7'E. The reef is rectangular in shape, 5 miles by 2.5 miles, and is best seen on the chart.

4.48 **Estrela Oil Field** (6˚26'S., 12˚22'E.), with several platforms, lies 5.5 miles WSW of the mouth of the Rio Lombo.

Bagre Oil Field (6˚26'S., 12˚16'E.), with one platform, lies about 11.5 miles WSW of the mouth of the Rio Lombo.

Cabeca da Cobra (6˚33'S., 12˚30'E.), a rounded headland with a rocky base, is located 10 miles SE of the mouth of the Rio Lombo and is surmounted by a moderately high hill. A light is shown from a tower with a dwelling, 13m high, standing on this headland. The village of Lubombe is situated about 1 mile E of the headland.

A bank, with depths of less than 5m, extends up to about 2.3 miles W from Cabeca da Cobra. Baixo de Dentro, a group of shallow rocks, lies on this bank, about 0.7 mile W of the headland. Baixo de Fora, a rocky shoal with a least depth of 4.4m, lies about 3.5 miles WSW of the headland.

Ponta do Quipai, located 8 miles SSE of Cabeca da Cobra, consists of lofty cliffs which are surmounted by shrubs and overlooked by a hill with a round, bare summit. A conspicuous clump of mangroves stands within this point and is visible from a considerable distance offshore.

The mouths of the Rio Lukulo and the Rio Sange lie 1.8 and 4.5 miles, respectively, SE of Ponta do Quipai.

Ponta do Quinzau (6˚54'S., 12˚45'E.) is located 18 miles SE of Ponta do Quipai. The coast between is fringed by an uninterrupted sandy beach which is backed by rocky cliffs and surmounted by bare, rounded hills. The cliffs in the vicinity of Ponta do Quinzau are about 40m high. A light is shown from a tower with a dwelling, 15m high, standing 0.5 mile N of Ponta do Quinzau. A prominent tower, 50m high, stands about 4 miles inland, 6.5 miles N of the light.

4.49 Lombo East Oil Terminal (6˚50'S., 12˚22'E.) lies about 23 miles W of Ponta do Quinzau. It consists of several platforms and an SBM which is moored in a depth of 36.5m. Vessels of up to 175,000 dwt can be handled. Vessels should anchor, in a depth of 40m, about 3 miles WNW of the SBM. Pilotage is compulsory. Pilots, who act as mooring masters, can be contracted by VHF and board in the vicinity of the anchorage. Vessels should send an ETA 7 days in advance to the operators (Texaco Angola) with confirmation messages sent 72 hours, 48 hours, and 24 hours before arrival. They should then contact the terminal when within VHF range. Vessels only berth during daylight, but can leave at any time.

Caution.—Vessels not proceeding to or leaving from the terminal are prohibited from approaching within 2 miles of it without prior permission.

4.50 Palanca Terminal (6˚57'S., 12˚24'E.) lies about 22 miles WSW of Ponta do Quinzau. It consists of several production platforms, two SBMs, and a 270,000 dwt storage tanker which is permanently moored in a depth of 42m. Vessels of between 40,000 and 280,000 dwt can be handled and generally moor bow to bow with the storage tanker. Vessels should anchor, in depths of 40 to 43m, sand and good holding ground, within an area lying 3.8 miles NW of the terminal. The swells in the vicinity of the terminal are predominantly from the SSW, with heights of 1.5 to 2.5m. They are strongest from May to October and reach a maximum 2 to 3 days before spring tides.

Pilotage.—Pilotage is compulsory. Pilots, who act as mooring maters, can be contacted by VHF and board in the vicinity of the anchorage area. They remain on board during the entire stay. Vessels should send an ETA 72 hours, 48 hours, and 24 hours in advance and then contact the terminal when within VHF range. Vessels only berth between 0700 and 1500 but can leave at any time.

Caution.—Vessels not proceeding to or leaving from the terminal are prohibited from approaching within 1 mile of the installations without prior permission.

4.51 Pacassa Oil Field (7˚08'S., 12˚26'E.), consisting of several platforms, lies 12 miles SSE of Palanca Terminal and is connected to it by a submarine pipeline. Bufalo Oil Field, with one platform (1988), lies E and adjacent to Pacassa Oil Field.

Canuku Terminal (7˚06'S., 12˚28'E.), a Floating Production Storage Offloading (FPSO) facility, lies 10 miles SE of Palanca Terminal.

Pilotage.—Pilotage is compulsory. The mooring and loading master, acting in the capacity of a pilot, boards 2.5 miles NE of the terminal.

Regulations.—Vessels are requested to report their ETA 48 hours before arrival. The ETA should be confirmed 24 hours in advance or when the ETA changes by more than 2 hours.

Berthing is done during daylight hours only. Unberthing may be done at any time, subject to agreement betweeen the vessel, the terminal, and the loading master.

Upon arrival, vessels may be directed to anchor 3 miles NE of the terminal.

4.52 The **Rio Lucunga** (6˚57'S., 12˚48'E.) flows into the sea, 4.5 miles SE of Ponta do Quinzau. The mouth of this river is indicated by several clumps of trees standing close to the beach. Several white factory buildings are situated at Mucula, 0.5 mile SE of the mouth.

A bank, with depths of less than 8m, lies about 3 miles offshore, SW of the river mouth. Enseada de Mucula, a slight indentation, lies S of the mouth of the river. Vessels with local knowledge can approach this indentation and obtain anchorage, in a depth of 6m, off the factory buildings.

The coast extending up to about 7 miles S from the mouth of the Rio Lucunga is bordered by a sandy beach. Between the S end of this beach and the Rio M'bridge, 8 miles S, it consists of low, rocky cliffs which are intersected by ravines. These ravines are of a yellowish color and contrast with the blue tint of the sea and the green tint of the inland countryside.

4.53 The **Rio M'bridge** (Rio Mebridege) (7˚12'S., 12˚51'E.), which is used only by local craft, can easily be recognized by Ponta Palmas, its N entrance point. This point is wooded and the dark hue of the trees contrasts strongly with the yellowish tint of the cliffs on the S bank of the river. The river mouth is fronted by breakers which extend up to 0.3 mile seaward. The land to the S of the entrance is formed by low cliffs, which are surmounted in a few places by thick clumps of trees. A range of hills stands inland of the river mouth.

Baia de Ambrizete (Baia de Nzeto) (7˚14'S., 12˚51'E.), a slight indentation, lies between the Rio M'bridge and a bluff, 3.5 miles S. This latter bluff rises in a high and almost sheer cliff which is covered with herbage. From the S, the bluff appears as a projecting point and is very prominent. Within the bluff stands, a range of hills. The S and highest hill of this range has a conspicuous flat top which can be easily recognized from a considerable distance.

Ambrizete Light is shown from a tower, 20m high, standing on the bluff. A disused light structure and a small white dwelling are situated close N and close W, respectively, of the light.

Girassol Oil Field (7˚39'S., 11˚48'E.), an FPSO and nearby SBM, are about 85 miles W of Baia do Ambriz. A restricted area around the FSPO, with a radius of 7 mile, contains a waiting area for tankers.

Vessels not involved with this installation should give it a wide berth.

Nzeto (Ambrizete) (7˚14'S., 12˚51'E.), a small town, stands at the head of the indentation, 1.5 miles S of the Rio M'bridge. It is situated on the rising ground, which stretches toward the bluff, and is fronted by a small breakwater. Two prominent radio masts stand close together in the town.

Depths of less than 5m lie up to about 1 mile offshore between the town and the bluff and vessels should give this area a wide berth. Anchorage can be taken, in a depth of 9m, sand and mud, about 2.5 miles SW of the mouth of the Rio M'bridge, but only vessels with local knowledge should use this roadstead. The bottom changes to rocks and stones to the S of the anchorage and the depths shoal rapidly. A constant swell is experienced at the anchorage and rollers are reported to frequently break in a depth of 9m off the town.

4.54 Baia de Juma (7˚20'S., 12˚54'E.), a slight indentation in the coast, extends SE for 5 miles from the S entrance point of Baia de Ambrizete. The Rio Ambrizete, with a mouth barred by sand, flows into the N part of this indentation, about 3 miles SE of Nzeto (Ambrizete). The S part of the indentation is fronted, for about 3 miles, by a sandy beach. Anchorage, with local knowledge, can be taken in this indentation, but the bottom is very foul and there is a heavy swell.

The coast extending SSE from Baia de Juma is bold and cliffy with occasional sandy coves. The high white cliffs are surmounted by trees.

4.55 Ponta da Musserra (7˚36'S., 13˚00'E.), located 22 miles SSE of Nzeto (Ambrizete), forms the S entrance point of a small bay. The shores of the bay are low, but high cliffs rise abruptly at the S entrance point and are surmounted by a prominent cross. Several factories are situated at Musserra, near this bay.

The bottom fronting the bay is rocky and foul in places. Vessels without local knowledge should not anchor in depths of less than 16m or less than about 2 miles offshore.

The Ararat Hills rise inland, close S of Ponta da Musserra, and stand parallel to the coast for 5 to 6 miles. They attain heights of up to 200m and are the highest peaks between the Congo River and Luanda. These hills are of basaltic formation, steep, and mostly bare except for a little brushwood. They are brown and arid in appearance and are covered with superb masses of pink-colored granite, which rise in picturesque forms.

A very conspicuous mass of granite surmounts the summit of one of these hills, which rises about 5 miles inland, 28 miles SSE of Nzeto (Ambrizete). This mass is about 18m high and is in the form of a pillar.

The mouth of the Rio Sembo (Rio Quicembo) lies 8.7 miles SSE of Ponta da Musserra. This river is insignificant and, except between January and June, its entrance is obstructed by a barrier of sand. Two villages are situated on the S slope of Ararat Hills. The southernmost village stands abreast a sandy beach, 2 miles NNW of the mouth of the Rio Sembo. It is conspicuous from seaward, as the conical huts are much lighter in color than the dark trees which form the background.

Ponta Two Trees, located 2 miles NNW of the Rio Sembo, is a low, sloping, and grassy point. Two conspicuous isolated palm trees are reported to stand on this point.

The N entrance point of the Rio Sembo is low and wooded. The bluff, which forms the S entrance point, consists of a perpendicular whitish cliff, about 1 mile long. A sandy coast extends from this cliff to the mouth of the Rio Loge, 5 miles SSE. Vessels with local knowledge can obtain good anchorage off the Rio Sembo.

4.56 Ponta do Ambriz (7˚50'S., 13˚06'E.), located 15 miles SSE of Ponta da Musserra, is formed by a high, white, and perpendicular cliff. This point, which is fringed by foul ground, assumes the appearance of being detached, especially in misty weather, as the land extending to the N of it is low. A light is shown from a tower, 14m high, standing 0.3 mile ENE of the point and a disused light structure is situated near it. Two radio masts, about 50m high, stand close SSE of the light.

A narrow and rocky bank, with a least depth of 3m, extends up to about 1 mile NNW of Ponta do Ambriz and is marked by a lighted buoy.

Baia do Ambriz, a slight indentation in the coast, lies between Ponta do Ambriz and Ponta Loge, 3 miles NNW. The latter point is low, sandy, and fringed by a bank on which the sea always breaks. It was reported (1989) that a light was shown from a tank standing on Ponta Loge.

The Rio Loge flows into the head of this indentation, 1.5 miles N of Ponta do Ambriz. The mouth of the river, which is marked by several unusually light-green lofty trees, is blocked by a bar; only small boats can cross it. Within the entrance, there are depths of over 3m and the river is reported to be navigable by small craft almost to its source, about 180 miles upstream. A rock, awash, lies about 0.3 mile off the head of the indentation.

Porto do Ambriz (7˚50'S., 13˚06'E.) lies at the S end of Baia do Ambriz. This small harbor consists of a basin, which has a dredged depth of 5m and a quay along its W side. It is approached through a channel, 0.5 mile long, which is dredged to a depth of 5m over a width of about 90m. This channel is marked by buoys and indicated by a lighted range. Pilotage is compulsory. Pilots can be contacted through Petromar Ambriz Port Radio Station and are available during daylight hours only. The best anchorage off the harbor is in a depth of 10m, to the NE of the light shown from near Ponta do Ambriz. The harbor is mostly used by fishing boats and vessels servicing the offshore oil and gas installations.

Caution.—Vessels should not enter the approach channel without permission. Passage through the approach channel is difficult when the swell, which usually runs at right angles to the fairway, is accompanied by a cross wind.

4.57 Enseado do Capulo (7˚59'S., 13˚11'E.), lying 9.5 miles SSE of Ponta do Ambriz, is 1.5 miles wide between its rocky entrance points. The village of Capulo stands at the head of this bay near the Rio Uezo, a small stream. Monte Bamba, with a rounded summit and sloping sides, rises 2 miles inland, E of the bay. This hill appears detached from the others in the vicinity when seen from the W.

The coast in this vicinity presents an arid appearance, with an occasional clump of trees. A rocky shoal, with a least depth of 7m, lies about 0.5 mile off the N entrance point of the bay. A rocky bank, with depths of less than 11m, extends up to about 0.5 mile WNW from the S entrance point. Vessels with local

knowledge can anchor, in a depth of 11m, sand and shells, about 0.7 mile NNW of the S entrance point.

The coast between Enseada do Capulo and Enseada do Mussulo, 16 miles SSE, consists of steep white cliffs and is bordered by a reef which extends up to about 1 mile offshore. The Rio Onzo flows into Enseado do Mussulo; its mouth is indicated by a deep fissure in the cliffs which forms a valley filled with a mass of dark verdure. A range of hills, irregular in outline, runs parallel with this stretch of coast, a short distance inland. In addition, the peaks of the Mussulo Hills rise 10 to 11 miles inland and are conspicuous.

The village of Mussulo Grande, with some factories near it, is situated on the shore of Enseada do Mussulo and is visible from seaward. Anchorage can be taken by vessels with local knowledge, in a depth of 15m, within this bay.

The coast extending SSE for 8 miles from Enseada do Mussulo is cliffy. The mouth of the Rio Lifune lies 13 miles SSE of the bay and can be distinguished by masses of lofty trees which line the coast in this vicinity and appear in contrast to the red color of the land.

4.58 Ponta do Dande (8˚28'S., 13˚21'E.) is located 4 miles SW of Ponta do Catumbo, the S entrance point of the Rio Lifune. This point is formed by the sloping base of some steep cliffs which front a bold headland. These cliffs, which appear vertical from the SW, extend E for 1.5 miles from the point and end in a sheer bluff at the mouth of the Rio Dande. A light is shown from a prominent tower standing on Ponta do Dande and a radio mast, 49m high, is situated 1.2 miles E of it.

Ponta do Dande Light

Baia do Dande lies between Ponta do Catumbo and Ponta do Dande. A rocky shoal, with a least depth of 4m, lies about 1.7 miles NNE of Ponta do Dande. The coastal bank, with depths of less than 5m, extends up to about 1 mile offshore at the head and in the N part of the bay. Anchorage can be taken, in a depth of 10m, about 0.5 mile N of Ponta do Dande.

Baia do Bengo is entered between Ponta Spilimberta, located 7.2 miles SSE of Ponta do Dande, and Ponta das Lagostas, 11 miles SSW. The coast between Ponta do Dande and Ponta Spilimberta consists of high, red and white cliffs. The town and fort of Cacuaco are situated on the S shore of the bay. They stand at the termination of some red and white cliffs, which contrast with the low land at the head of the bay.

4.59 Ponta das Lagostas (8˚45'S., 13˚18'E.) is formed by a perpendicular cliff of yellowish tint which is surmounted by trees. A light, shown from a tower, 14m high, standing on this point, is partly hidden by trees; a chimney stands 1 mile ESE of it.

Ponta das Lagostas Light

It was reported (1985) that a T-shaped cement loading jetty, with dolphins, extended 0.5 mile NNW from a point on the S shore of the bay, about 0.8 mile ESE of Ponta das Lagostas. The jetty has a 210m long head with a depth of 14.3m alongside.

Caution.—The navigation light shown from Ponta das Lagostas has been reported to be difficult to distinguish from other lights in the vicinity.

Luanda (8˚48'S., 13˚15'E.)

World Port Index No. 46560

4.60 The port of Luanda, one of the finest harbors on the W coast of Africa, is entered between Ponta das Lagostas and Ponta da Ilha, 2.4 miles WSW. The latter point is the NE extremity of Ilha de Luanda (Ilha do Cabo), a low and narrow island which shelters the seaward side of the port. This island, which is about 3.5 miles long, is connected to the mainland by a causeway at its SW end.

Luanda, the capital of Angola, stands along the S part of the harbor and extends toward the interior on the adjacent plateau.

Winds—Weather.—Winds from the WNW, WSW, and SE usually predominate. Winds occasionally blow from the N, but very rarely from the NE quadrant. During the day, the wind generally effects a complete rotation of direction. In the morning, the wind is weak and usually from the S and E quadrants. In the afternoon, it then blows from the N and W,

becoming fresh. At nightfall, the wind weakens and blows from the W and S quadrants.

During the period between December and May, tropical disturbances of short duration may occur, although rarely. These disturbances may consist of gusts from NNE and ESE, with velocities of up to about 50 knots.

Precipitation occurs from September to May in the form of showers. March and April are the hottest months and also the months with the greatest rainfall. These showers are generally preceded by gusty winds from the E. Thunderstorms occur frequently in March and April, but are not very frequent during the remaining months. During the dry season, no rain occurs, but morning fog may appear. The fog forms particularly during June, July, and August, but rarely causes any difficulty.

Tides—Currents.—The tide rises about 1.8m at springs and 1.4m at neaps.

In the vicinity of Luanda, the current has been reported to set E, or directly onto the coast, at a rate of about 0.7 knot. Although this current is not constant, it is by no means infrequent.

Off Luanda, the characteristic West African swell is felt throughout the year, but it is usually strongest from April to September. The interior of the harbor is well-protected and always calm.

Depths—Limitations.—A shoal bank, with depths of less than 10m, extends up to about 0.3 mile seaward from the NW side of Ilha de Luanda. This bank, which is steep-to at its NE end, also extends up to about 0.6 mile NE from the NE extremity of the island. The harbor entrance has depths of 15 to 30m.

The principal commercial pier and wharf are situated in the SW part of the harbor. They provide 2,020m of main quayage, with depths of 8.5 to 11m alongside, which affords ten berths for ocean-going vessels. The port has facilities for general cargo, ro-ro, bulk, tanker, and container vessels. Vessels of up to 305m in length and 10.3m draft can be accommodated alongside.

An offshore oil and gas berth, consisting of several mooring buoys, is situated in the E part of the harbor. A submarine pipeline leads ESE and connects this berth to the shore. Vessels of up to 230m in length and 13m draft can be accommodated.

A naval installation is situated at the SW side of the harbor. It is fronted by a wharf, 295m long, which is reported to have a depth of 11m alongside.

Aspect.—A light is shown from a framework tower on a building, 11m high, standing at the NE end of Ilha de Luanda (Ilha do Cabo). A lighted buoy is moored about 0.9 mile NE of this light. It has been reported (1998) that the light has been extinguished.

An aeronautical radiobeacon is situated 2 miles S of Ponta das Lagostas.

A prominent oil refinery and a cement factory are situated l.3 miles SSW and 1 mile ESE, respectively, of Ponta das Lagostas. Chestnut-yellow smoke can normally be sighted from seaward rising in the vicinity of the cement factory.

Fortaleza de Sao Miguel stands in the SW part of the harbor. This fort is conspicuous, yellow in color, and floodlit at night. An observatory, with a square tower, and a yellow-colored conspicuous hospital stand about 0.4 mile S of the fort. An airport is situated 2.7 miles SSE of the fort.

A bank building, one of the highest buildings of the city, stands 0.6 mile ESE of the fort. Its sign, which is illuminated until about 0100, forms an excellent landmark and has been reported to be visible from more than 25 miles.

Fortaleza de Sao Pedro do Barra stands on the E side of the harbor, 1.4 miles SW of Ponta das Lagostas. This fort is low, formed by a cutting in the solid cliffs, and has a double tier of gun ports. A prominent monument is situated near the shore, 0.6 mile NNE of the fort. A prominent chimney stands 0.8 mile S of the fort.

Several stranded wrecks lie along the shores of the harbor and may best be seen on the chart.

Pilotage.—Pilotage is compulsory for vessels over 300 grt and is available from 0800 to 2200. Pilots can be contacted by VHF and generally board about 1 mile S of Lighted Buoy No. 1. Vessels should Vessels should send an ETA 72 hours and 6 hours in advance.

It was reported (1995) that vessels are berthed during daylight hours only.

Anchorage.—A designated anchorage area for waiting vessels, about 1 mile square, has been established. It has depths of 24 to 31m and lies centered 1.3 miles NNW of Ponta das Lagostas.

Caution.—Due to some unknown cause, large quantities of dead fish are occasionally washed up on the shoal bank which extends NE from the NE end of Ilha de Luanda.

With high SW winds, the sea breaks over part of Ilha de Luanda and drives quantities of sand into the harbor. In addition, quantities of soil are washed down from the heights during the rainy season. Both of these actions have resulted in the SW part of the harbor becoming very shallow and drying in places at LW.

Prohibited anchorage areas, which may best be seen on the chart, lie in the SW and NE parts of the harbor.

A 1,833.2m measured distance, which may best be seen on the chart, lies on the seaward side of the N part of Ilha de Luanda and is marked by beacons.

Oil and gas exploration is being carried out along this coast and vessels are warned that numerous wellheads, submerged pipelines, drilling rigs, and platforms may be encountered in the approaches to the port. Vessels should exercise care when navigating in this vicinity as many of the associated structures and installations are often moved and are not charted.

Luanda to Lobito

4.61 The coast between Ilha de Luanda and Ponta das Palmeirinhas, 22 miles SW, consists of a low, sandy spit which encloses an extensive, but mostly shallow lagoon.

Ponta do Mussulo (8˚52'S., 13˚09'E.), located about 5 miles SW of Luanda, is the S entrance point of Barra da Corimba, the mouth of the lagoon. A group of prominent radio masts is situated 3 miles SE of this point. Morro da Cruz rises on the mainland, 6.5 miles SSW of the point. This hill is 54m high and prominent.

Ponta das Palmeirinhas (9˚06'S., 13˚00'E.) derives its name from the clump of palm trees standing on it. A light is show from a prominent square tower, 38m high, standing 1.7 miles N of this point.

Enseada do Buraco is entered 4.5 miles NNE of Ponta das Palmeirinhas. This small bay provides anchorage, in a depth of 11m, about 0.6 mile offshore.

The **Rio Cuanza** (9˚21'S., 13˚09'E.) flows into the sea 16 miles SE of Ponta das Palmeirinhas. This shallow river is of considerable importance and its muddy waters discolor the sea for up to about 10 miles offshore. The river mouth lies close N of a long and sandy spit and is fronted by a bar which is continually changing. The sea frequently breaks right across the bar and it is extremely dangerous for boats. However, small craft, with drafts of 2.4 to 2.7m, can cross the bar at HW and ascend the river for many miles. A smooth sea and local knowledge are necessary.

A conspicuous monument stands on the coast, 2.5 miles NNW of the mouth of the Rio Cuanza. Anchorage can be taken off the river entrance by vessels with local knowledge. Vessels are advised to anchor, in depths of 22 to 27m, about 9 miles offshore, or, in a depth of 16m, about 3 miles offshore.

The land extending inland for 40 miles between the Rio Cuanza and the Rio Longa, 58 miles SSE, is a national park. It is reserved for wild animals and has few inhabitants.

The coast between the Rio Cuanza and Cabo Ledo, 20 miles S, is bordered by red cliffs of moderate height.

Caution.—Oil and gas exploration is being carried out along this stretch of the coast and vessels are warned that numerous well heads, submerged pipelines, drilling rigs, and platforms may be encountered up to about 10 miles offshore. Vessels should exercise care when navigating in this vicinity as many of the associated structures and installations are often moved and are not charted.

4.62 Baia do Suto (Enseada de Suto) (9˚38'S., 13˚13'E.) is entered between Ponta do Sangano and Cabo Ledo, 7 miles S. A rock, awash, lies about 1.2 miles WNW of Ponta do Sangano and Baixo do Suto, with a least depth of 5.3m, lies about 2.7 miles NNE of Cabo Ledo.

A small and sandy cove lies in the S part of the bay;the Rio Suto flows into its head. This river has a good flow in the rainy season, but its mouth is often choked with sand. Vessels with local knowledge may obtain anchorage, sheltered from SW winds, in a depth of 10m, about 0.9 mile NE of Cabo Ledo. However, a strong swell sets around the cape at times and causes vessels to roll heavily.

4.63 Cabo Ledo (9˚41'S., 13˚12'E.), a high and black promontory, is rugged and covered with trees. This cape is easily recognized from seaward as it is a salient point and presents the appearance of a truncated cone. A light is shown from a stone tower with dwellings, 12m high, standing on the summit of the cape. A radio tower, 50m high, stands 7 miles ENE of the light.

The coast between Cabo Ledo and Cabo de Sao Braz, 19 miles SSE, is bordered by remarkable white cliffs. The latter cape is steep-to and Enseada Sao Braz (Baia de Sao Braz) lies close N of it. A sandy spit encloses a salt water lagoon in the S part of this bay and a large swamp lies at the foot of the hills rising close S of the bay. Anchorage can be taken by vessels with local knowledge, in depths of 6 to 14m, within the bay.

The coast between Cabo de Sao Braz and Ponta do Longa, 15 miles SE, is backed by a high tableland. The latter point is formed by a bluff headland which is covered with brushwood.

Cabo das Tres Pontas (10˚23'S., 13˚32'E.), a projecting headland, is located 13.5 miles SSE of Ponta do Longa. A light is shown from a tower with a dwelling, 14m high, standing on this cape.

A bay lies between Ponta do Longa and the cape; the Rio Longa empties into the head. Except at the mouth of the river, which is thickly wooded, the shores of the bay consist of high, unbroken cliffs.

4.64 Ponta do Morro (10˚45'S., 13˚43'E.), located 25 miles SSE of Cabo das Tres Pontas, is very high, with perpendicular cliffs on its seaward side. This point forms one of the most remarkable headlands along this part of the coast and its summit is covered with tall cactus trees.

Morro Cambiri, a headland, is located 2.3 miles NE of Ponta do Morro. It is 65m high and marked by a light. A monument stands on the coast, 0.3 mile NNE of the headland. An airfield lies 1 mile NE of the headland; an aeronautical radiobeacon is situated in its vicinity.

Porto Amboim (Benguela Velha) (10˚44'S., 13˚45'E.) (World Port Index No. 46570) lies close NE of Morro Cambiri. Vessels anchor and work cargo in the roadstead. A jetty, 123m long, fronts the town and is used by lighters.

Anchorage can be taken in convenient depths, but the roadstead is somewhat exposed to the SW swell. Good anchorage can be taken, in a depth of 18m, about 0.3 mile NNW of the light on Morro Cambiri. Good anchorage can also be taken, in a depth of 22m, mud, WNW of Morro Cambiri. Local knowledge is advised.

Caution.—A wreck, with a least depth of 3m, lies about 0.4 mile WSW of Morro Cambiri.

Several piers, which carry suction pipes, extend seaward from the shore between 0.5 mile and 2 miles NE of Morro Cambiri. The pipes convey fish from vessels moored at the pierheads to several fishmeal factories situated on the shore.

4.65 The **Rio Cuvo** (10˚52'S., 13˚48'E.) flows into the sea through a low, wooded plain, 8 miles SE of Ponta do Morro. The cliffy nature of the coast along this stretch disappears in the vicinity of the river mouth. However, the cliffs reappear to the S of the river entrance and continue, almost without interruption, for 90 miles to Porto do Lobito. Several yellow patches, the result of landslides, can be seen in these cliffs.

The summits of several high mountains, which rise inland, may be observed during clear weather, especially in December, January, and February.

Novo Redondo (Gunza-Kabolo) (Sumbe) (11˚12'S., 13˚50'E.) (World Port Index No. 46580) lies 27 miles SSE of Ponta do Morro. The town is partially obscured by heights which extend from the beach and on which two conspicuous water tanks stand. A light is shown from a column, 7m high, standing near a white dwelling on the N corner of a prominent fort. An airfield lies 2 miles NNE of the light and an aeronautical radiobeacon is situated in its vicinity. Two radio masts stand 0.5 mile SSE of the fort.

The Rio Gunza empties into the sea close N of the town. For 5 or 6 months of the year, this river is absorbed by the porous sand through which it flows.

A pier, used by lighters, fronts the shore near the light. Vessels anchor and work cargo in the roadstead. Depths of less than 5m extend up to about 1 mile offshore and Baixo do Inconcon, with a least depth of 0.6m, lies about 0.2 mile offshore, between 0.5 and 0.9 mile SSW of the light. Anchorage can be taken, in depths of 7 to 13m, sand, about 1.8 miles W of the fort, but this roadstead is exposed to a predominant SW swell.

4.66 Enseada do Quicombo (Baia de Quicombo) (11˚18'S., 13˚49'E.), into which the Rio Cubai flows, lies 7.5 miles S of Novo Redondo. The small town of Quicombo, which stands along the S part of the bay, may be recognized from the N and W by a remarkable zigzag road. This conspicuous road ascends from the back of the town and leads over the mountains behind it.

The S entrance point of the bay is formed by a red bluff. Baixo de Salvador Correia, a rocky shoal, extends up to about 0.7 mile NW of the point. This shoal has a least depth of 3.8m and the sea frequently breaks on it.

The town is fronted by a small wharf and anchorage can be taken, in a depth of 9m, sand and mud, NW of it. The bay affords good anchorage, except during the time of the heaviest rollers (December to August).

Ponta Vermelha, located 2.5 miles SSW of the S entrance point of the bay, may be recognized by patches of red marking its SW face. A light is shown from a tower, 14m high, standing on this point.

An isolated depth of 18m was reported (1984) to lie about 17.5 miles W of the light.

4.67 Cabeca da Baleia (11˚35'S., 13˚46'E.), located 15.5 miles S of Enseada do Quicombo, is a dark-colored point which projects about 1 mile from the coast. It may be identified by a tableland which rises near the beach, 2 miles to the N.

The coast between Cabeca da Baleia and the mouth of the Rio Balombo, 23 miles S, consists of high and perpendicular chalky cliffs, which may be seen from a considerable distance to seaward in the rays of the afternoon sun.

Baia dos Pombos, lying close S of Cabeca da Baleia, is a slight indentation in the coast. It has a fine sandy beach and terminates to the S in a rocky point. This indentation is about 5 miles wide and the sea breaks with considerable violence along its shores.

The mouth of the Rio Eval (Rio Tapado) lies 12 miles S of Cabeca da Baleia and may be identified by some vegetation rising in a somewhat steep ravine. Anchorage can be taken by vessels with local knowledge, in a depth of 15m, about 1 mile W of the river mouth.

Egito Praia (11˚58'S., 13˚46'E.) stands at the mouth of the Rio Balombo, 11 miles SSW of the mouth of the Rio Eval. This small town may be identified by a large white house, which stands half way up the cliff of a deep gorge. In addition, a conspicuous cliff, in the shape of a wedge, rises close S of the river entrance. Several houses are situated close to the beach at the bottom of the gorge and some factories stand in the town. Good anchorage can be taken by vessels with local knowledge, in a depth of 12m, about 1.5 miles offshore.

Ponta do Egito (12˚00'S., 13˚43'E.) is located 3 miles SW of Egito Praia. A light is shown from a tower, 9m high, standing on this point.

Enseada do Binge, an indentation in the coast, lies between a point, located 5 miles SSW of Ponta do Egito, and Ponta do Binge, 5 miles SSW. A large village, fronted by a sandy beach, is situated in the middle of this indentation. Landing can be effected along the shore of the indentation by boats, even though the sea breaks on the beach with considerable force.

Caution.—In some places along this stretch of coast, depths of less than 13m have been found lying up to 3 miles offshore.

Lobito (12˚20'S., 13˚34'E.)

World Port Index No. 46590

4.68 The port of Lobito, which resembles by its configuration the port of Luanda, is an excellent and secure natural harbor. It is also the terminus of the railway which connects with Zaire and Zambia.

The harbor is sheltered on its NW side by a narrow and sandy spit which extends NE for about 3 miles to Ponta da Restinga, its NE extremity. Numerous bungalows and buildings are situated along this spit.

Winds—Weather.—Throughout the year, sea breezes predominate during the afternoon and vary between SW and NW. At other hours of the day, the winds are variable and it is generally calm at night. Precipitation, usually in the form of showers, occurs from November to April, with the months of March and April having the most rainfall. Precipitation is weak from November to January and there is practically no rain from May to October. Thunderstorms are rare and fog is infrequent.

Tides—Currents.—The tides rise about 1.7m at springs and 1.3m at neaps.

The tidal currents in the vicinity of the harbor are negligible. A swell from the WSW predominates outside the port, but the harbor is always calm.

Depths—Limitations.—The main commercial berthage consists of Quay No. 1, which extends along the SE side of the sandy spit, in the SW part of the harbor and Quay No. 2, which extends along the head of the harbor.

Quay No. 1 is 570m long and has a depth of 10.4m alongside. Quay No. 2 is 552m long and has depths of 10.3 to 10.6m alongside.

There are facilities for general cargo, bulk, tanker, passenger, and container vessels. Vessels of up to 275m in length and 10.3m draft can be accommodated.

Aspect.—A light is shown from a framework tower, 11m high, standing on Ponta da Restinga, the NE extremity of the sandy spit. A prominent radio mast is situated 1 mile SW of this light. The government residence, with a large conspicuous tower, and a conspicuous church tower are situated 1 mile SW of the radio mast.

Buoys, which mark the entrance to the fairway, are moored about 300m E and 0.3 mile E of Ponta da Restinga. Lobito Light is shown from a tower with a dwelling, 15m high, standing on the top of the mainland cliffs, 0.7 mile E of Ponta da Restinga.

A cement factory, with a prominent chimney, is situated 1.5 miles SW of the light and a radio tower stands 0.4 mile S of it.

It has been reported that the yellowish-brown smoke rising from this chimney can be seen from a considerable distance.

Several prominent oil tanks stand on a small area of reclaimed land lying 0.4 mile SW of the cement factory. Several conspicuous port installations, including silos, stand in the SW part of the harbor. The head of the harbor is occupied by an extensive bank which dries at LW and gives off an offensive odor.

Pilotage.—Pilotage is compulsory within the harbor entrance and is only available during daylight hours. Vessels should send an ETA by radio 24 hours before arrival on weekdays and 48 hours before arrival on weekends. The port can usually be contacted by VHF during daylight hours. The pilot boards between Lighted Buoy No. 4 and Lighted Buoy No. 6.

The maximum speed permitted in the harbor is 8 knots.

Anchorage.—The harbor provides sheltered and calm anchorage with good holding ground. The designated anchorage area, which may best be seen on the chart, lies in the middle of the harbor. It has depths of 14 to 31m and is marked by buoys.

Caution.—The sand spit at the NW side of the harbor is reported to be extending NE at a rate of about 30m a year. It was reported (1988) that shoaling extended up to about 200m ESE from Ponta da Restinga and vessels should give this point a wide berth.

Anchorage is prohibited within the harbor between the N side of the designated anchorage area and the sandy spit in order to provide free passage for vessels proceeding to the quays.

Several wrecks lie within the harbor and may best be seen on the chart.

It was reported (1994) that numerous fishing vessels may be moored in the N part of the designated anchorage area.

A measured 1 mile distance, which may best be seen on the chart, lies on the seaward side of the N part of the sandy spit, and is marked by beacons.

The buoys marking the seaward entrance of the harbor fairway are often moved and should not be relied upon.

Lobito to Namibe (Mocamedes)

4.69 The coast between Ponta da Restinga and Baia de Benguela, 18 miles SSW, is low and wooded with few landmarks.

The **Rio Catumbela** (12˚27'S., 13˚29'E.) flows into the sea 10 miles SW of Ponta da Restinga. Its mouth may be identified from the W by a remarkable niche in the hills, located 4 miles inland, through which the river flows. The town of Catumbela stands close W of this niche. Two hills, each 150m high, rise on the S bank of the river, about 0.3 mile E of the town and 3.5 miles inland. They are both surmounted by old forts, which consist of a long building, with a red roof, surrounded by a stone wall. When approaching the river, these forts are prominent, but they would probably be mistaken for ordinary dwellings from farther seaward.

Several factories, with tall chimneys, are situated on the N bank of the river, 0.5 mile W of the town, but they are mostly hidden by vegetation.

The river overflows its banks during the rainy season and inundates a large area, but it is no more than a large stream in the dry season.

4.70 **Baia de Benguela** (12˚35'S., 13˚24'E.) lies between the mouth of the Rio Cavaco, located 8 miles SW of the Rio Catumbela, and Ponta do Sombreiro, 6.3 miles WSW. The shore of this bay is chiefly composed of a sandy beach. The city of Benguela stands in the NE part of the bay on a marshy plain which is almost inundated during the rainy season (March and April). A lighted range is shown from the vicinity of the city and indicates the anchorage. The front light is shown from a tower, 7m high, standing in front of an old fort; the rear light is shown from the N tower, 12m high, of a church. Vessels can anchor, in a depth of 13m, on this range. Local knowledge is advised as the bay is reported to be obstructed by numerous fish traps. The roadstead is only used by fishing craft and local coasters, as ocean-going vessels now proceed to Lobito.

Ponta do Sombreiro (12˚35'S., 13˚18'E.) is the N extremity of a promontory. Morro do Sombreiro, a very conspicuous hill, rises close within this point. It is 124m high and has a hat-like appearance. A light is shown from a column, 7m high, standing on this hill.

Caution.—Between Ponta do Sombreiro and **Ponto do Porto** (15˚47'S., 11˚51'E.), 225 miles SSW, great depths are found close to the coast and anchorage is rendered almost impossible, except within a few sheltered bays. Vessels are advised to maintain a good distance from the shore, as the swell sets toward the coast.

Caution is necessary along this stretch of coast in order to avoid overestimating the distance from the land due to the light sandy nature of the low-lying foreshore and the extreme haziness of the atmosphere which generally prevails.

The current along the coast to the NE of Ponta das Salinas sets offshore, but between this point and Baia de Equimina, 23 miles SSW, the current sets toward the land and caution should be exercised.

4.71 The coast between Ponta do Sombreiro and Ponta das Vacas, 5 miles WSW, is cliffy and forms several snug coves where boats and small craft can shelter. A prominent water tower stands 1 mile SW of Ponta das Vacas.

Baia Farta lies between Ponta das Vacas and Ponta de Sao Jose, 1.8 miles NW. This latter point is formed by a rounded, sandy tongue. The head of the bay consists of a sandy beach. The village of Baia Farta stands in the SW corner of the bay, near the mouth of a small stream. It is fronted by several small piers which are used by fishing craft. Vessels with local knowledge can obtain excellent anchorage, in a depth of 25m, about 0.6 mile S of Ponta de Sao Jose and about 0.3 mile offshore.

The coast between Ponta de Sao Jose and Ponta das Salinas, 22 miles SW, is steep-to and consists of white, sandy beaches. The shore is difficult to distinguish until very close as it projects far from the hills inland.

Baia Tenda Grande, a slight indentation, lies 2 miles NE of Ponta das Salinas. A prominent water tower stands in the settlement, which is situated at the head of this indentation.

4.72 **Ponta das Salinas** (12˚50'S., 12˚56'E.) is a low, rounded, and sandy point which extends up to about 6 miles W of the hills inland. A light is shown from a conspicuous square

tower, 38m high, standing on this point. A dwelling surmounts a sand dune which rises close E of the light.

Ponta Bongue, located 9 miles SSE of Ponta das Salinas, is fringed with rocks; depths of less than 5m lie up to about 0.4 mile N and NW of it. A prominent stone beacon, 2m high, stands on this point.

Ponta Norte and Ponta Sul, each surmounted by a beacon, are located 200m and 400m, respectively, E of Ponta Bongue.

Enseada do Cuio is entered close E of Ponta Bongue. The village of Cuio, fronted by a small pier, stands at the head of this bay; two range beacons are situated on the SE shore. Anchorage within the bay is considered bad as it is exposed to the SW wind and swell.

The coast between Ponta Bongue and Baia da Equimina, 15 miles SW, is steep-to and high. The land is broken at intervals by ravines which run down to the sea and form small bays. Streams flow through these ravines. Generally, the small bays afford temporary shelter in fine weather, but only for vessels with local knowledge.

Baia da Equimina (13˚11'S., 12˚47'E.) lies between Ponta dos Papeis and Ponta Equimina, 2.5 miles SW. Ponta dos Papeis is fronted by a conspicuous white cliff, 90m high, which extends 2 miles NE. The remains of a sugar plantation are situated at the center of the bay and several of the partially ruined buildings are prominent. A fish factory, with two conspicuous chimneys, stands in the SW corner of the bay. Small vessels with local knowledge can anchor, in a depth of 25m, about 0.3 mile NE of Ponta Equimina. This anchorage is not recommended as it is exposed to the sea breeze and the bottom shoals rapidly.

4.73 Ponta dos Frades (13˚13'S., 12˚43'E.) is located 6.2 miles SW of Ponta dos Papeis. A light is shown from a tower with dwellings, 9m high, standing 0.4 mile SSE of this point.

Rochas dos Frades, consisting of three rocks, lies on a rocky shelf which extends up to about 0.2 mile NW of Ponta dos Frades. These rocks are 4m high and steep-to.

Baia dos Elefantes (13˚13'S., 12˚44'E.) is entered between Ponta dos Frades and Ponta do Leste, 2.5 miles ENE. The bay provides the best anchorage along this part of the coast, as it is sheltered from the prevailing winds and from the rollers, which occasionally set in. It is reported that sharks often frequent this bay.

The current off the bay generally sets NNW, but occasionally it sets E and attains a rate of 1.5 knots.

The buildings of an abandoned whaling station, a few huts, and an observatory are situated in the SW corner of the bay. A conspicuous tableland, 233m high, rises near the SW corner of the bay. The names of many British naval vessels, outlined in stone and whitewashed, are situated near the summit on the E side of the tableland and are visible from a considerable distance to seaward. The land rises to a height of 350m close inland of this tableland.

Although the bay is deep, the depths decrease gradually toward the shore. Good anchorage can be taken, in a depth of 29m, about 0.7 mile NNE of the old whaling station.

4.74 The coast between Ponta dos Frades and Cabo de Santa Maria, 16 miles SW, is backed by granite mountains. The granite is interspersed with patches of alabaster, mica, and quartz, which reflect the rays of the sun like a vast mirror and are visible from a considerable distance.

An indentation, with steep cliffs rising from its shores, lies between Ponta dos Frades and Ponta Choca, 4 miles SW. Baia do Limagem, entered between Ponta Choca and Ponta Limagem, 2.5 miles SSW, is a sandy bay lying at the mouth of a ravine. This bay affords sheltered anchorage to small vessels with local knowledge.

The coast between Ponta Limagem and Ponta Juliana, 3.8 miles SSW, consists of high cliffs which are broken at intervals by ravines. Sandy beaches front the mouths of most of the ravines.

Baia das Tainhas, lying 5 miles SW of Ponta Juliana, has an entrance 0.7 mile wide. It is surrounded by steep cliffs, except for a ravine located at the S end. Good anchorage, sheltered from the prevailing wind and swell, may be taken by large vessels, in a depth of 30m, about 0.3 mile off the sandy beach fronting the head of this bay.

4.75 Cabo de Santa Maria (13˚25'S., 12˚32'E.), located 16 miles SW of Ponta dos Frades, is of moderate height and is surmounted by a small pillar. This pillar replaces the original one which was placed there by Diego Cam in 1486. A light is shown from a tower with dwellings, 12m high, standing on the cape.

Cabo de Santa Maria Light

A high and isolated hill, with a flat top, stands 2.5 miles E of the cape and can be seen above it from the S.

Baia de Santa Maria is entered between Cabo de Santa Maria and Arranca Ferro (Ponta Leste), the NW extremity of a promontory, 0.8 mile ENE. Ilheu Liesse (Ilheu dos Passaros), 58m high, lies near the center of the bay. Depths of less than 4m lie between this small island and the head, but elsewhere the bay is deep. Anchorage can be taken, in a depth of 24m, sand and decayed coral, midway between Ilheu Liesse and the W shore of the bay. This anchorage, although sheltered, is only suitable for small vessels.

4.76 The coast between Cabo de Santa Maria and Cabo de Santa Marta, 28 miles SSW, consists mostly of granite cliffs which rise steeply from the sea. These cliffs are intersected in a few places by valleys which terminate in broad sandy beaches.

Ilheus do Pina (13˚27'S., 12˚31'E.), a group of rocks, lies about 2 miles S of Cabo de Santa Maria. The largest rock, which is black and 35m high, lies about 1 mile offshore.

A small islet lies 0.3 mile SW of a point located 4.3 miles S of Cabo de Santa Maria.

The Rio Catara flows into the head of a small bay, 6.5 miles S of Ilheus do Pina. Landing can be effected by surfboats at the S end of this bay. Anchorage can be obtained by vessels with local knowledge, in a depth of 18m, about 450m off this river mouth, but the change from considerable depths to those suitable for anchoring is very sudden.

Enseada do Bonfim (13˚49'S., 12˚32'E.) is entered 15 miles S of the mouth of the Rio Catara. This bay affords anchorage, in a depth of 29m, about 300m from the shore.

Baia de Santa Marta (13˚51'S., 12˚30'E.), a large indentation, is entered between Ponta da Bissonga, located 1.5 miles S of Enseada do Bonfim, and Cabo de Santa Marta, 6 miles WSW. Several small bays lie along the shore of this indentation and may be used for shelter by small vessels with local knowledge.

4.77 Cabo de Santa Marta (13˚53'S., 12˚25'E.) is of moderate elevation and forms a salient feature on this part of the coast. It marks the termination of the high, cliffy coast. A light is shown from a tower with a dwelling, 14m high, standing on this cape.

The mouth of the Rio Carunjamba lies 4.5 miles S of the cape. Ponta do Inamagando, located 7 miles SSW of the river, is the S entrance point of Baia das Matilhas. The Rio Inamagando flows into the head of this bay.

Ponta das Salinas is located 7.8 mile SSW of Ponta do Inamagando and Baia das Salinas is entered close E of it. Anchorage, sheltered from the predominant winds and swell, may be obtained by vessels with local knowledge, in a depth of 16m within this bay.

Ponta Grossa (14˚13'S., 12˚20'E.), located 2 miles S of Ponta das Salinas, can be identified by the prominent red and yellow composition of the cliffs. A light is shown from a tower, 14m high, standing on this point.

4.78 Ponta dos Mocuandos (14˚18'S., 12˚22'E.), the SW entrance point of Baia Velho, is located 5 miles SSE of Ponta Grossa. The Rio de Sao Nicolau (Rio Bentiaba) discharges into the bay and a reef, with a least depth of 3m, extends up to about 1.5 miles seaward from the S side of its mouth. Temporary anchorage can be obtained by vessels with local knowledge, in a depth of 9m, within this bay, but it is exposed and offers no shelter.

Monte Velho, 229m high, rises on the S side of Baia Velho, 6 miles from the mouth of the Rio de Sao Nicolau. This hill forms a good landmark as it has a truncated shape and is of a darker color than the coast in the vicinity.

Lageas (14˚24'S., 12˚21'E.), consisting of two rocks, lies about 1 mile offshore, 6 miles S of Ponta dos Mocuandos. The tallest rock is 2.7m high.

4.79 Ponta Piambo (14˚41'S., 12˚17'E.) is located 19 miles SSW of Lageas. Except for Enseada do Chapeu, which lies 3 miles S of Lageas, the coast is devoid of landmarks between these rocks and the point. A light is shown from a tower, 18m high, standing on Ponta Piambo.

Ponta de Santa Gertrudes, marked by a beacon, is located 9 miles SSW of Ponta Piambo. Baia do Baba lies close E of this point, but provides no shelter. However, anchorage can be obtained, in a depth of 27m, within this bay.

Baia do Mucuio lies 3.5 miles SSW of Ponta de Santa Gertrudes. Vertical cliffs separate this bay from Baia das Pipas, which is entered close E of Ponta do Gigante and 6.8 miles SSW of Ponta de Santa Gertrudes. Good anchorage can be taken by vessels with local knowledge, in depths of 18 to 24m, within Baia das Pipas.

Enseada do Cherungo, lying 4 miles SSW of Ponta do Gigante, has depths of up to 13m lying 0.5 mile offshore. The Rio Giraul flows into the sea 6.8 miles SSW of Ponta do Gigante.

Ponta do Giraul (15˚08'S., 12˚07'E.), located 11 miles SSW of Ponta do Gigante, lies on the N side of Baia de Namibe. This point is rounded, rocky, and steep-to. A light is shown from a prominent tower with a dwelling, 24m high, standing on this point.

Ponta do Giraul Light

Namibe (Mocamedes) (15˚12'S., 12˚09'E.)

World Port Index No. 46610

4.80 Baia de Namibe (Baia de Mocamedes) lies between Ponta do Giraul and Ponta das Barreiras, 4 miles SSW. Namibe, an important fishing harbor, lies in the SE corner of the bay and Porto Saco (Porto Salazar), an ore and tanker terminal, lies in the NE corner of the bay

Winds—Weather.—Sea breezes predominate and are weak during the morning, but fresh in the afternoon. During the night, the wind is usually weak or moderate and from between S and SW. During the dry season, especially from June to August, winds from the E sometimes blow. They are hot, dry, and carry sand which causes uncomfortable weather. The winds are strongest in February and March. Throughout the year, the winds rarely exceed a velocity of 10 knots and never attain a velocity of 30 knots. There is little rain and it is limited to showers. Thunderstorms are rare, but may occur during March and April. Fog is frequent from May to August and occurs principally at dawn and in the morning. A mist may sometimes remain throughout the day.

Tides—Currents.—The tides rise about 1.7m at springs and 1.4m at neaps.

The tidal currents are variable and weak, but sometimes attain a rate of 1 knot. Strong SW swells are frequent and can

occur during any month of the year. They sometimes cause strong surging at Namibe.

Depths—Limitations.—The entrance and middle part of Baia de Namibe have great depths.

Baixo Amelia, with depths of less than 5m, extends up to about 1.3 miles N from Ponta das Barreiras. It consists of sand, stones, and rock and is steep-to at the N end. This shoal is very dangerous and the sea breaks heavily over it at times.

Baixo do Diabo, with depths of less than 5m, extends up to about 0.5 mile W from the S side of the entrance to the Rio Berio, at the head of the bay.

At Porto Saco, the bulk ore quay is 325m long and has a depth of 18m alongside. It is equipped with a conveyor system for loading iron ore and can handle vessels of up to 200,000 dwt and 16.4m draft. The tanker quay is 480m long and has a depth of 18.8m alongside. It can handle vessels of up to 18.5m draft.

At Namibe, the main quay is 875m long. It has 480m of berthage for ocean-going cargo vessels, with a depth of 10.5m alongside; 130m of berthage for coasters, with a depth of 6.1m alongside; and 265m of berthage for fishing vessels, with a depth of 3m alongside. Cargo vessels of up to 10.3m draft can be accommodated.

It was reported (1995) that the quay at Namibe is in poor condition and only has a depth of 8m alongside.

Aspect.—The bay is backed by some ranges of hills which appear very white from seaward when the sun is shining on them. From Ponta do Giraul, the N entrance point, cliffs, 15 to 30m high, extend E and NE for about 1.8 miles.

A conspicuous white water tower stands at the head of Porto Saco, 1.5 miles NE of Ponta do Giraul and several oil tanks, also conspicuous, are situated 0.4 mile NE of it.

The E shore of the bay consists of a sandy beach, near the middle of which is the mouth of the Rio Berio. This river is almost absorbed into the ground before reaching the bay.

Ponta das Barreiras, the S entrance point, is low and sandy. Several prominent fishing installations are situated close E of this point.

Ponta do Noronha is located in the S part of the bay, 3 miles SSE of Ponta do Giraul. It is faced with a perpendicular sandstone cliff, 38m high. Several conspicuous fish oil tanks and buildings stand on the top of the cliff. A light is shown from a square tower standing on this point. A prominent radio mast stands 1.5 miles SE of the light.

Ponta do Noronha Light

The city of Namibe stands in the SE corner of Baia de Namibe and an airport is situated 1 mile SE of it. An aeronautical radiobeacon is reported to be situated in the vicinity of this airport. Fortaleza de Sao Fernando, marked by a light, is situated l.2 miles ESE of Ponta do Noronha. It stands near the shore in the middle of the city and is conspicuous. The Governor's Palace, a large pink building, is situated close SW of the fort and a church, with two domes, stands close SW of it.

Two prominent radio masts, 30m high, stand 0.6 mile NE of the fort.

A lighted range, which may best be seen on the chart, leads in a NE direction and indicates the approach to Porto Saco.

Pilotage.—Pilotage is compulsory but is only available from 0600 to 2100. Pilots board at the entrance to the bay. Vessels are not berthed after 2000. Unberthing may be done at any time, but must be previously arranged through the pilot.

Regulations.—Vessels proceeding to Porto Saco and which are carrying inflammable cargo must send an ETA with product details at least 48 hours in advance via Luanda (D3E).

Anchorage.—Baia de Namibe provides good anchorage and is sheltered from all winds except from those between N and NW. Good anchorage, out of the swell, may be obtained, in a depth of 13m, mud and sand, in the SE part of the bay, about 0.5 mile NW of Fortaleza de Sao Fernando.

Tankers and bulk ore vessels normally moor off Porto Saco; the anchorages are assigned by the port authorities.

Caution.—A fishing fleet is often encountered off Baixa Amelia at night.

It is reported that the navigation lights in the vicinity of the bay cannot be relied upon.

Namibe (Mocamedes) to Ponta Albina

4.81 Ponta da Anunciacao (15˚14'S., 12˚03'E.), located 3 miles SW of Ponta das Barreiras, is low, sandy, and indistinctive. A spit, on which the sea breaks heavily at times, extends up to about 0.3 mile N from this point. To the S of the point, the coast becomes cliffy and is backed by hills.

Ponta Albina Light from NW

The **Rio dos Flamingos** (15˚33'S., 12˚01'E.) enters the sea, 19 miles S of Ponta da Anunciacao, from a gorge lying S of Morro Columbi, which is 117m high. A light is shown from a tower with dwellings, 11m high, standing 1 mile SSE of the river mouth. A stranded wreck lies on the foreshore about 8 miles N of the river mouth.

Cabo Negro (15˚40'S., 11˚56'E.), located 9.5 miles SSW of the mouth of the Rio dos Flamengos, is a remarkable headland. It is formed by a precipitous mass, about 65m high, which rises at the extremity of a low point and resembles an island. The cape has a round and rugged black face, which is encrusted by different colored earths and sands abounding in fossilized shells. The summit of the cape is surmounted by a pillar which is the remains of a marble cross erected there by Diego Cam in 1486.

The Rio Curoca (Rio Coroca) enters the sea 3 miles SSW of Cabo Negro. A bridge spans this river about 1 mile within its mouth.

4.82 Tombua (Porto Alexandre) (15˚48'S., 11˚50'E.) is entered between Ponta do Pinda, located 2 miles SSW of the Rio Curoca, and Ponta do Porto, 3 miles SW. The latter point lies at the NE extremity of a low, narrow, and sandy peninsula which forms the N and W sides of the harbor. The town stands along the S shore of the bay, which is low and sandy. The harbor is sheltered and frequented by fishing vessels and coasters with local knowledge.

Ponta do Pinda, the N entrance point, is 38m high. It is prominent and projects from the interior like an immense wall. Ponta do Porto, the S entrance point, is low. A light is shown from a structure, 8m high, standing on this point. Both the harbor and the town can usually be seen over the peninsula. A small airport is situated 1 mile E of the town.

Banco do Pinda, with a least depth of 8m, lies about 1.2 miles NNE of Ponta do Porto, in the N approach to the harbor. Baixo da Ponta Brava, with depths of less than 10m, extends up to about 1 mile N from the N side of the peninsula.

The town is fronted by a small jetty. Vessels can moor within the bay, in depths of 20 to 30m, sand and mud with good holding ground. The best anchorage lies, in a depth of 29m, mud, about 0.2 mile off the town.

Regulations.—Vessels may not berth at night after 2000. Vessels may leave at night if prior arrangements have been made with the pilot.

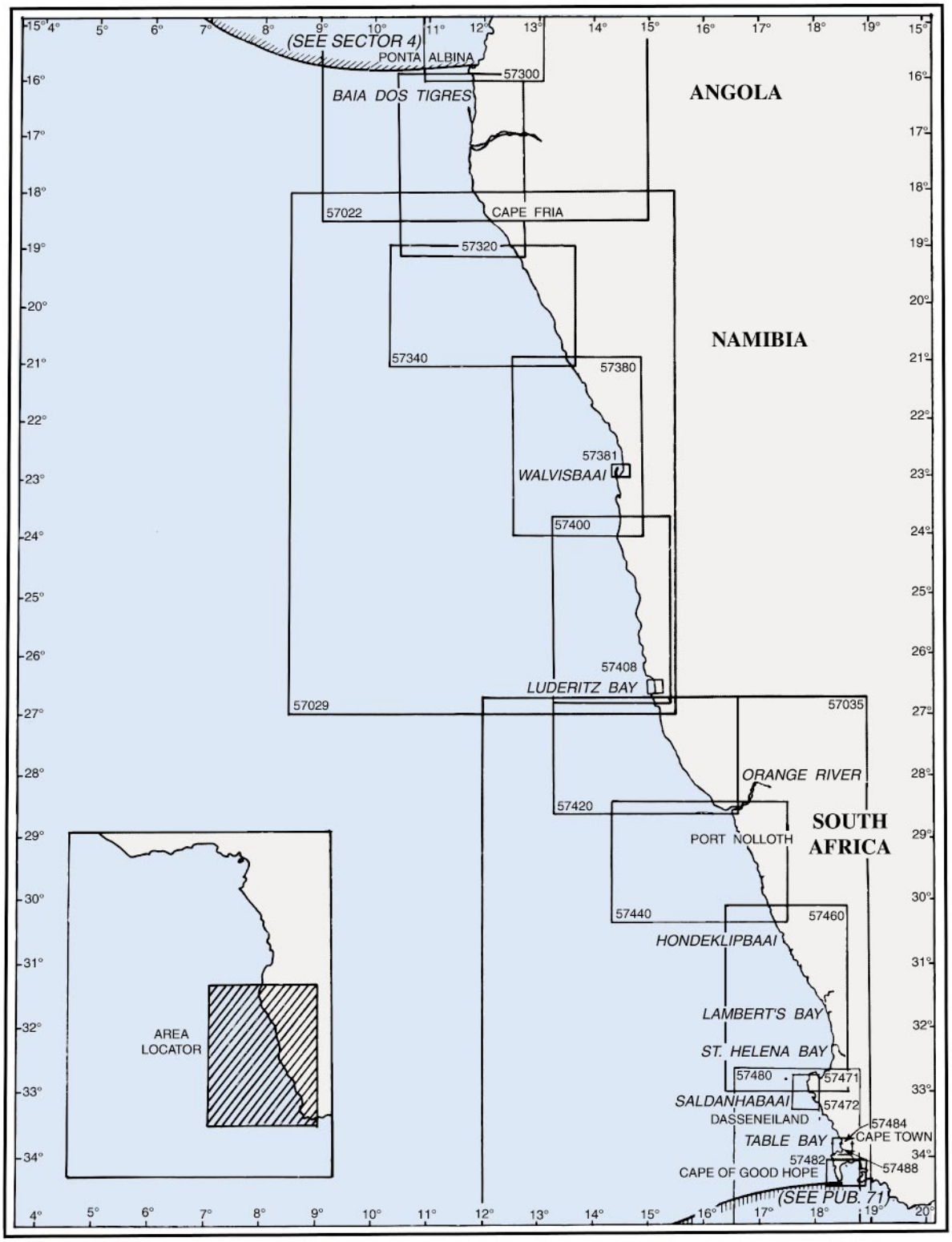
Caution.—It has been reported (1998) that all aids to navigation may be missing, unlit, out of position, or otherwise unreliable.

4.83 Banco Grande (15˚45'S., 11˚48'E.), with depths of less than 13m, extends up to about 3.5 miles N of a point on the shore located 4 miles W of Ponta do Porto.

Ponta Albina (15˚53'S., 11˚44'E.), a low point, is located 9 miles SW of Ponta do Porto. A light is shown from a tower, 38m high, standing on this point and another tower, 7m high, is situated close to it.

Caution.—Ponta Albina is reported to be extending to the W. The coast in this vicinity is formed by a low and sandy beach on which there are heavy breakers.

The sea in this area is always in a state of disturbance due to the currents running past this point in a violent and irregular manner, generally in a N or NW direction.



Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.

SECTOR **5** — CHART INFORMATION

SECTOR 5

ANGOLA, NAMIBIA, AND SOUTH AFRICA—PONTA ALBINA TO THE CAPE OF GOOD HOPE

Plan.—This sector describes the SW coast of Africa from Ponta Albina to the Cape of Good Hope, and includes the port of Cape Town. The descriptive sequence is from N to S.

General Remarks

5.1 The coast from **Cabo Negro** (15˚40'S., 11˚56'E.), previously described in paragraph 4.81, to beyond **Ichabo Island** (26˚17'S., 14˚56'E.), N of Luderitz Bay, is a desert region of arid sands. The sandy coastal belt slowly rises to a high plateau about 60 to 100 miles from the coast.

The country S of the **Orange River** (28˚38'S., 16˚28'E.) consists of a series of three terraces, divided by mountain ranges varying in elevations from 1,200 to 2,438m, and rises gradually in a series of open sterile plains from the river as far as 32˚00'S. It gradually declines from N to S. The passages from one plateau to another are through narrow and difficult gorges.

Caution.—The seamounts lying W of the SW coast of Africa are described in paragraph 6.8 and paragraph 6.24.

Baia dos Tigres

5.2 **Baia dos Tigre** (16˚35'S., 11˚46'E.), the most spacious bay in Angola, is entered about 38 miles S of Ponta Albina. The bay is bounded on its W side by the Peninsula dos Tigres, a low, sandy spit, with **Ponta da Marca** (16˚31'S., 11˚43'E.) at its N extremity. The land on the E side of the bay consists of a succession of high sandhills which rise abruptly from the coastline and extend far inland in broken and irregular ridges, with no trace of vegetation. The bay, about 18 miles long in a N-S direction, is about 6 miles wide at its entrance, narrowing to a width of about 2 miles at its head. The S end of the bay is called Saco dos Tigres. In 1963, the sea broke through the peninsula at Saco dos Tigres, separating it from the mainland and transforming it into an island.

The bay provides good shelter from the prevailing winds (W and SW), in spite of the low height of the peninsula, as the depths and nature of the bottom allow ships to anchor close to the peninsula. The bay is frequented principally by fishing vessels and coasters.

Winds—Weather.—The prevailing wind is from the SW, with less intensity from June to September. Strong W winds, known as “garroas,” sometimes occur, but are usually of short duration. Strong winds from the E, known as “lestadas,” sometimes occur from May to July. Small swells and seas form with fresh winds, due to the large size of the bay and the low altitude of the peninsula. Rain is practically nil throughout the year. Fog is frequent from May to July, occurring with greater frequency at dawn and in the morning, and sometimes persisting all day.

Depths—Limitations.—Depths of over 50m lie about 0.5 mile from Ponta da Marca, then extend N from the meridian of the light. Depths of over 20m lie about 0.2 mile off the major part of the E side of the peninsula, gradually shoaling toward the mainland, where depths of over 10m parallel the coast at a distance of about 1 mile. Enseada das Pedras, close N of Sao Martinho dos Tigres, is shoal, forming Baixo da Capalanca, with depths of less than 3m, extending about 0.7 mile from the coast N of the town.

Aspect.—Ponta da Marca Light, equipped with a radar reflector, is shown from the NE extremity of the Peninsula dos Tigres. Another radar reflector is situated about 0.5 mile SW of the light. The town of Sao Martinho dos Tigres lies on the E side of the peninsula, about 5 miles S of Ponta da Marca. Leao Light is shown close E of the town.

There is a small airport and a conspicuous church in the town, and fish warehouses can be seen N of the town. Fish warehouses can also be seen near Ponta do Castigo, about 1.5 miles N of the town.

Pilotage.—Pilots are not available. The port administration comes under the port captain of the Port of Namibe.

Anchorage.—Anchorage may be obtained in convenient depths, good holding ground of mud, sand, and ground shells, in any part of Baia dos Tigres.

Anchorage and fishing are prohibited in the charted area, the N limit of which is delimited by a line drawn in a 120˚ direction from a marker in position 16˚44'S, 11˚44'E, extending to the opposite shore.

When seeking a sheltered anchorage, the direction and strength of the wind are factors to be considered. Therefore, anchorage should be taken on the W side of the bay with W winds, and on the E side of the bay with E winds.

Anchorage is recommended in the following positions:

1. In Enseada das Barracas, in about 29m, about 0.3 mile offshore, with Ponta da Marca Light bearing 320˚, distant about 0.9 mile.
2. In Fundeadouro do Leao, off Sao Martinho dos Tigres, in about 20m, with Leao Light bearing 270˚, distant about 0.4 mile. This is the anchorage most commonly used.
3. In Enseada do Pau, about 4 miles farther S, in 19m, about 0.3 mile offshore, with Casa do Pau, at the S end of the small bay, bearing 195˚, distant about 0.5 mile.
4. In Enseada dos Morrinhos, about 7.5 miles S of Sao Martinho dos Tigres, in 17m, about 0.4 mile offshore, with the beacon, at the NW end of the prohibited area, bearing 210˚, distant about 0.7 mile.

Directions.—The Peninsula dos Tigres is difficult to identify from offshore. By day, the light at the N end of the peninsula, the water tank at Sao Martinho dos Tigres, and some chimneys of the fishing installations are only visible at a distance of about 6 miles. Great caution is necessary when approaching the coast in the vicinity of the bay, due to the frequent mist, making it difficult to judge distances. The first things then seen are the breakers off the coast. Vessels approaching from S should give the peninsula a berth of at least 5 miles to keep in depths of over 20m, then gradually diminishing to a berth of 1 mile off the NW and N sides of the peninsula. In approaching

Fundeadouro do Leao, Leao Light should be kept bearing greater than 225˚, in order to avoid Baixo do Capalanca.

Caution.—A local magnetic anomaly has been reported to exist on the E side of Baia dos Tigres.

Baia dos Tigres to Rocky Point

5.3 The coast between the S end of Baia dos Tigres and the mouth of the Rio Cunene, about 25 miles S, consists entirely of sand crowned with dark tinted dunes, which are visible from seaward at a distance of 15 or 16 miles. There are no known off-lying dangers along this coast.

The **Rio Cunene** (17˚15'S., 11˚45'E.), known as the Kunene River in Namibia, only reaches the sea during the rainy season. During the dry season, its mouth is barred by a bank of sand on which the sea breaks furiously, especially in its S part. A marker lies on the S bank of the river mouth. Foz do Cunene, a village, lies on the N bank of the Rio Cunene, about 2 miles within its mouth. An airstrip is situated 1.5 miles N of the village. A conspicuous water tower stands 4.5 miles NNE of the river entrance.

The coast between the Rio Cunene and **Walvisbaai** (Walvis Bay) (22˚57'S., 14˚30'E.) is known as the Skeleton Coast, having been the scene of innumerable wrecks, not only from the imperfect nature of the surveys, but because onshore sets by the current are frequently experienced. A further cause is the prevalence of fog, especially during the winter. Vessels are therefore advised not to approach within 10 miles of the coast, and in fog or thick weather to keep outside depths of 200m as far as **Cape Cross** (21˚46'S., 13˚57'E.), thereafter, if making for Walvisbaai, outside of depths of 50m until Pelican Point Light is observed. If by-passing Walvisbaai, ships should stay well to seaward.

Caution.—The coast between the Rio Cunene and Cape Cross may lie up to 2 miles farther SSW than charted.

5.4 The coast between the Rio Cunene and Cape Fria, 75 miles SSE, is backed by high shifting sand dunes in its N part, and by high land for about 18 miles in its S part. The Hartmann Mountains, attaining elevations of up to 1,106m, lie about 30 to 40 miles inland, and form a prominent landmark in clear weather. A depth of 5.3m lies about 6 miles SSW of the mouth of the Rio Cunene and about 1.5 miles offshore; breakers have been reported seaward of this shoal. Bosluis Bay is an indentation lying 8 miles S of the mouth of the Rio Cunene. For a distance of 26 miles S of Bosluis Bay, foul ground consisting of rocky shoals, some of which have depths of less than 4.5m, exists up to 1.2 miles offshore. A rock, 3m high, the existence and position of which is doubtful, lies about 20 miles S of the mouth of the Rio Cunene.

A shoal, lying about 15.5 miles farther S and about 2 miles offshore, has a charted depth of 9.1m, and is marked by breakers, but probably has lesser depths.

5.5 **Cape Fria** (18˚26'S., 12˚01'E.) is low, sandy, and fringed by rocks. There are some conspicuous black hills inland of it. Depths NW of the cape are probably less than charted as, during a moderate SSW gale with a high sea, breakers were observed about 2 miles WNW of the cape. Breakers were reported (1962) about 7 miles WSW of Cape Fria.

False Cape Fria is a slight projection about 3 miles SSE of Cape Fria and is radar prominent.

Anchorage may be obtained, in fair weather, in 12 to 13m, sand and mud, midway between Cape Fria and False Cape Fria.

The coast between False Cape Fria and Rocky Point, 41 miles SE, presents an unbroken line of surf. An extensive bank of shallow water extends from a point 5 miles SSE of False Cape Fria for a further 12 miles in the same direction.

The shoals are about 1 mile wide and have least depths of 6m on the inner side and 10m on the outer side. They lie as much as 3.2 miles offshore. Breakers occasionally occur along the whole length of this bank.

5.6 **Rocky Point** (19˚01'S., 12˚29'E.) is a conspicuous rocky spit extending about 0.3 mile seaward. A large rounded boulder, whitened by guano, lies at the end of the spit. There is a patch of foul ground 4 miles N of Rocky Point, which is reported to extend 1 mile offshore.

Temporary anchorage can be taken, in 14m, about 1 mile NW of Rocky Point, by vessels with local knowledge. There is no landing place.

Caution.—Oil and gas exploration has been reported (1993) in the area between Rocky Point and **Dune Point** (20˚03'S., 13˚03'E.) for a distance of up to 80 miles offshore. Vessels are advised to exercise caution in this area.

Rocky Point to Cape Cross

5.7 The coast from Rocky Point to Cape Cross, 185 miles SSE, is flat, rocky, and backed by sand hills extending as far as the eye can see. These hills continue for mile after mile, and are varied occasionally by signs of vegetation.

The mouth of the **Hoarusib River** (19˚05'S., 12˚34'E.), 6 miles SE of Rocky Point, is reported to be closed during the dry season. The Sentinaal, a sandstone cliff, 155m high, located 2 miles NNE of the mouth of the Hoarusib River, is a conspicuous mark. Black Sand Hill (Black Sand Castle), 4 miles SE of the river mouth, and Little Castle, 2 miles further SSE, are the last black sand dunes on the coast.

A shoal, which only breaks occasionally and has a depth of 7.6m, was reported (1979) to lie about 7 miles SSW of Black Sand Hill and 2.2 miles offshore.

Mowe Point (19˚23'S., 12˚43'E.), 16 miles SSE of Black Sand Hill, lies at the S end of a slight indentation. A pole mast, at an elevation of 50m and on which a light was previously displayed, can be seen in good visibility. Heavy breakers were observed (1971) about 5 mile NW of Mowe Point, and about 2.5 miles offshore.

The mouth of the Hoanib River is generally inconspicuous, but the gap in the sand hills through which it runs can be seen on bearings between 060˚ and 100˚. Breakers have been reported 3 miles SW of the mouth of the river. A fertile valley exists in the vicinity of the gap, showing up as a patch of green.

5.8 **Sand Table Hill** (19˚44'S., 12˚55'E.) is a low tabular sand dune located 24 miles SSE of Mowe Point and 0.5 mile inland. There is a sharp sand cone located 7 miles NNW of it

and a striped sand hummock is located about 2 miles SSE of it. Sand Table Hill is most prominent when viewed from the NW, but it cannot easily be identified from more than 5 miles offshore.

Terrace Bay (19˚59'S., 13˚02'E.) lies about 17 miles SSE of Sand Table Hill. A visually and radar conspicuous mine dump lies 0.5 mile inland. Dune Point, a slight headland, lies about 2.5 miles SSE of Terrace Bay.

Caution.—Offshore oil and gas exploration has been reported (1993) in position 20˚00'S, 11˚40'E, about 80 miles W of Dune Point.

5.9 Swallow Rocks is a dangerous reef, with a depth of less than 2m, lying 4 miles SSE of Dune Point. This reef is about 0.5 mile long in a NW-SE direction and lies 0.8 mile offshore. Shoal water within the 10m curve extends for 1 mile in the same direction either side of the reef; soundings of 8.4m are found up to 1 mile offshore. The sea usually breaks heavily over the whole area. Ships navigating in the vicinity are advised to keep well to seaward as soundings outside the 10m curve give little indication of danger.

5.10 The coast between Swallow Rocks and Palgrave Point is radar conspicuous. The Uniab River, about 9 miles SE of Swallow Rocks, can be recognized by the moderately high cliffs on either side of its mouth.

Palgrave Point (20˚28'S., 13˚17'E.), about 15 miles SSE of the Uniab River, is a slight projection, with a line of breakers extending about 0.7 mile NW of it. The point is difficult to identify visually. Anchorage can be taken by vessels with local knowledge, in 18m, sand and mud, immediately N of Palgrave Point, with the outer breaker bearing 178˚. This anchorage is protected from the rollers to a certain extent, and with a S wind is considered safe, but a vessel should be ready to put to sea in a SW gale. In 1980, conspicuous stranded wrecks lay close offshore, 8 miles SSE and 2 miles N of Palgrave Point.

Caution.—A dangerous shoal, with a least depth of 8m, lies 3 miles S of Palgrave Point and about 1 mile offshore. The sea usually, but not always, breaks heavily over this shoal.

5.11 Great Table Mountain, rocky and prominent, lies about 26 miles NE of Palgrave Point. Sugar Loaf Hill lies about 14 miles E of the same point.

The mouth of the Huab River, about 4 miles SSE, is usually dry, and the foreshore in the vicinity is marked by dunes which are sickle-shaped and convex to the prevailing S winds.

Hogden Hafen (Ambrose Bay) is a small indentation about 10 miles SSE of the the Huab River. Ogden Rocks extend about 1.5 miles W of the point marking the S side of the bay. They are marked by breakers and should be given a wide berth.

A dangerous wreck lies 15 miles W of Hogden Hafen.

Anchorage, unsheltered and poor, may be taken by vessels with local knowledge, in a depth of 6.5m, about 0.5 mile offshore, with a prominent cone-shaped hillock bearing 056˚.

Durissa Bay, 14 miles SE of Hogden Hafen, lies W of the salt pans lying 6 miles S of the the Ugab River. The bay provides no safe anchorage or landing. Heavy surf is experienced along this section of the coast.

5.12 **Cape Cross** (21˚46'S., 13˚57'E.), 47 miles SSE of Ogden Rocks, is a barren spit extending 3 miles SW from the general direction of the coast, with low black cliffs at its seaward end, off which a reef extends about 100m. A 21m high black tower, surmounted by a black diamond, stands on the cape.

Inland from Cape Cross, flat, sandy, and rocky plains continue for several miles, rising to barren hills and mountains. A conspicuous peak, 714m high, about 21 miles NE of the cape, is the highest and most conspicuous of the mountain range that runs parallel with the coast. The peak has a nearby perpendicular fall on its S side with abrupt faces E and W. Brandberg, about 30 miles farther NE, rises to an elevation of 2,621m about 45 miles from the coast.

Shoal water, with a depth of 9m, is reported to lie 8 miles N of Cape Cross, with a depth of 18m, lies 2.5 miles offshore.

A shoal, with a depth of 15m, lies 4.5 miles SW of the cape. Cape Cross Bay, N of Cape Cross, has a village on its shore, in which there is a sealing factory. A building with two chimneys lies about 1.5 miles NE of Cape Cross.

Anchorage can be taken, over a sandy bottom, about 1 mile offshore in Cape Cross Bay. Landing is usually rather difficult, and is sometimes impossible in adverse weather.

Cape Cross to Walvisbaai

5.13 The coast between Cape Cross and Swakopmund, 63 miles SSE, is generally clear, with depths of less than 20m extending up to 3 miles offshore.

Due to the low nature of the coast, the irregularity of the soundings, and the possible existence of uncharted rocks or shoals within 6 miles of the coast, the greatest caution must be exercised when approaching the coast in misty or foggy weather, or at night.

A beacon stands on Lunenberg (Lagunenberg), a coastal range of hills about 8 miles ESE of Cape Cross, at an elevation of 185m. The hill on which this beacon stands is reported to be radar conspicuous.

Farilhao Point (22˚10'S., 14˚17'E.), low and sandy, projects 1 mile seaward, and lies 30 miles SE of Cape Cross. A water tower, 2.5 miles N of the point, is radar conspicuous. Great Spitzkop, 1,758m high, and Little Spitzkop, rise 54 and 47 miles, respectively, ENE of Farilhao Point, and can be identified on clear days. Woltzka'sbaken, a village of small scattered houses, lies 17 miles SSE of Farilhao Point.

5.14 **Swakopmund Road** (22˚41'S., 14˚30'E.) is an open roadstead fronting the town of Swakopmund. The town is a holiday resort, and is no longer used as a port. The Swakop River, discharging close S of the town, is dry except for 1 or 2 months during the summer. The entrance of the river, blocked by a sand bar, is marked by thick, green foliage, and has rocks on its S side, while the buildings of the town are on the N bank of the river bed.

Aspect.—A light is shown at Swakopmund. Two radio masts, the taller 70m high and marked by obstruction lights, stand near the light. A radio mast, painted in red and white bands and marked by fixed red obstruction lights, lies about 6 miles N of the same light. A beacon stands on the S side of the entrance to the Swakop River. It was reported (1993) that a

Courtesy of Simon Baillie-Cooper
Swakopmund Light

jetty had been renovated as a historic monument and is used only for sightseeing.

Anchorage.—Anchorage may be taken in 12m, sand and mud, with Swakopmund Light bearing 075˚, distant about 0.7 mile, but the anchorage is not recommended in S winds, and vessels are advised to keep in depths of over 15m.

Caution.—Swakop Reef, with depths of less than 9m, extends about 0.7 mile from the coast, S of the metal jetty extending from Swakopmund and is generally marked by breakers. A pinnacle rock, with a depth of 7.9m, lies off Swakop Reef, 1 mile S of the light.

Caution Reef (22˚45'S., 14˚31'E.) extends about 0.3 mile offshore, 4.5 miles S of Swakopmund.

Walvisbaai (22˚57'S., 14˚30'E.)

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5.15 Walvisbaai (Walvis Bay), 12 miles S of Swakopmund, is entered between Pelican Point (22˚53'S., 14˚27'E.), the N extremity of the Walvis Peninsula, and Bird Rock, 5 miles E. The port is the center of a large fishing industry, and the exports are fishmeal and fish products, copper, lead, vanadium ores, and guano.

Sovereignty of Walvis Bay was transferred to the Namibian government from South Africa in 1994.

Hospital facilities are available at Walvis Bay. The airport is situated about 9 miles from the center of town. Rail service to the interior is conducted by the Namibian government and serves Windhoek, the capital of Namibia, as well as other towns, and links with the railroad of the Republic of South Africa.

The Walvis Peninsula, consisting entirely of sand, forms the W side of Walvisbaai. It has a general height of 0.6 to 1.2m, with a few scattered dunes which are constantly changing in shape, height, and position by the strong SW winds. During exceptionally high spring tides, extensive areas on the E side of the peninsula are awash.

The head of the bay consists of a shallow lagoon and a mud flat, which is also awash, at exceptionally high tides. Bird Rock, a low flat islet, resembles a pier from seaward; a line of pylons extends between the islet and the shore. A wooden platform stands on the islet from which guano is collected.

A dredged channel leads to the harbor facilities at the head of the harbor.

Winds—Weather.—The swell off the coast in the vicinity of Walvisbaai is normally moderate and SW, becoming heavy from that direction after the passage of a deep depression at the Cape of Good Hope. A NW swell is rare and seldom enough not to interfere with fueling or watering vessels at anchor. With the strong E winds of winter, there may be considerable sea running out in the bay; the strong afternoon sea breeze may also cause a lively sea, especially after several consecutive days in summer.

Sea fogs are frequent off this coast at all seasons, but are more so, near the shore, in autumn and winter (April to September). They may appear at any time of the day, with a SW wind, even of force 5, and in winter with a NW wind. The fog may persist over the sea for several days. Normally, fog covers only the bay and the buoyed approach channel to the wharf during the night and early morning, receding seaward before noon, so that it is possible to enter the port on most afternoons, even in foggy spells. An exception to this is the fog, brought by NW winds, which may approach and cover the bay at any time of the day, remaining until the following morning. During winter, land fogs frequently form after a clear dawn and drift over the bay, but these are usually short in duration and usually disperse by noon. However, the incidence of fog in the harbor area and buoyed channel has decreased appreciably in recent years.

Tides—Currents.—The tidal rise at Walvisbaai is 1.6m at springs and l.2m at neaps. During periods of strong SSW winds, a current runs in the opposite direction alongside the main wharf and has been felt strongly within a distance of 300m of the wharf. At times, this current is so strong that vessels berthing or unberthing require tugs to counteract it. Observations have shown that the stronger the wind from this direction, the stronger will be the current experienced. There is no perceptible current with winds from any other direction, or during periods of calm.

During N winds, a surge, seldom more than 0.6m in height, is sometimes experienced along the main wharf. Berth l to Berth 3 are generally tolerable under these conditions, whereas

Berth 4 and Berth 8 are by far the worst. The tanker berth is also subject to surge.

On the flood, a tidal current of 0.5 to 1 knot sets SW across the dredged approach channel, and past the tanker berth and Hofmeyer Wharf. The ebb current sets NE out of the lagoon, and when this is flooded, the current may attain a rate of 4 knots at springs.

Depths—Limitations.—The dredged channel leading to the main wharf is maintained at a depth of 12.8m over a width of 134m. Ships in the dredged channel must have an underkeel clearance of 1.2m.

Hofmeyer Wharf fronts the main part of town. With its extension (known as New Wharf), it is 1,400m long. Berth 1, Berth 2, and Berth 3 have a total length of 504m and a depth of 10.6m alongside. Vessels with a maximum length of 224m and a maximum draft of 10.4m can be accommodated.

New Wharf (Berths 4-8) has a length of 926m and depths of 10.6m alongside. At Berth 4 through Berth 8, a draft of 10m is acceptable, but ships must have an underkeel clearance of 0.6m at all times while alongside. A mechanized ore-loading plant is situated at Berth 3. Ro-ro vessels use Berth 4 and Berth 6 while container vessels use Berth 7 and Berth 8.

A dolphin-type concrete tanker berth, 235m long and connected to the shore by a catwalk, lies on the E side of the inner end of the dredged entrance channel. A light is exhibited at each end of the tanker berth. Tankers 128m to 192m in length, with a maximum draft of 9.9m and not exceeding 25,000 tons displacement, can berth at the tanker berth.

A sea wall, extending about 1.5 miles NE of the tanker berth, has fish factories, with their own jetties, on it. A channel, dredged to 6.5m over a width of 100m, leads to the basin N of the sea wall. The basin is dredged to depths of 6 to 7m.

A shiplift, at the SW end of the fishing harbor wharf, can accept vessels of 2,000 tons displacement, 79m in length, and 6m draft.

Aspect.—The coast between the Swakop River and Walvisbaai consists of shifting sand dunes, 90 to 115m high, behind the coastal sand dunes, which are 3 to 25m high and covered with sparse vegetation.

Spit Buoy is moored l.2 miles N of Pelican Point. Fairway Lighted Buoy is moored about 3 miles E of Pelican Point, 0.6 mile N of the entrance to the main dredged channel.

Pelican Point Light is shown from a black round tower, 34m high with white bands, about 1 mile SSW of Pelican Point; a racon is situated at the light. Radar reflectors around the tower provide good radar contact in the form of a star. A trellis-work beacon, 13m high, is situated about 0.5 mile SSW of the light.

The main channel is marked by lighted and unlighted buoys, however, the odd-numbered buoys are painted white. All buoys soon assume a white appearance due to being covered with guano by the teeming bird life in the area.

Lights, in range 183˚, lead through the main channel. The front light is shown from a warehouse on Hofmeyer Wharf. The rear light is shown from a tower on a railway building about 0.3 mile S.

Lights, in range 246˚, are situated close SW of the dredged basin. The sheds and cranes on the main wharf are prominent. The Fisheries Research Station, about 0.5 mile NE of the main wharf, is conspicuous, and is brilliantly lighted at night.

The Roman Catholic Church tower, 37m high, and surmounted by an illuminated cross, 5m in height, is also conspicuous about 0.7 mile farther S. Two radio masts; the taller, with an elevation of 70m and marked by red obstruction lights, stands about 0.2 mile NE of the Roman Catholic Church. A water tower is conspicuous about 0.7 mile SE of the same church.

Pilotage.—Pilotage is compulsory. Pilots board in the area 1 mile NW of Fairway Lighted Buoy and will conduct vessels through the dredged channel between 0600 and 2000. Departing vessels must leave the wharf not later than 2145. Vessels arriving at the night should anchor NW of Fairway Lighted Buoy.

Vessels wishing to proceed up the dredged channel should, between 0600 and 2200, contact Walvis Bay Port Control by VHF, giving at least 1 hour notice; when Port Control is closed, vessels should contact Pelican Point Light on VHF channel 14 or 16. In addition, vessels should contact Harbor Control on VHF channel 16, giving their ETA, when 12 miles N or S of Pelican Point Light, depending on their direction of approach. Port traffic is directed by VHF via the assistant port captain between 0600 and 2000. Radio reporting points have been established 11.5 miles NNW and 12.5 miles SSW of Pelican Point Light. There is a port radio station at Walvisbaai.

Anchorage.—Good anchorage, in mud, can be taken anywhere in the bay according to draft, remaining clear of the spoil grounds. Anchoring is prohibited within 0.6 mile of Fairway Lighted Buoy.

Caution.—When a ship is approaching from the S, it should be noted that the cranes on Hofmeyer Wharf give good radar returns which usually appear first on the screen. These should not be confused with the light pattern.

Great caution must be exercised when approaching Walvisbaai in thick or foggy weather, or at night, due to the low nature of the coast. Pelican Point is reported to be extending NE and vessels should not pass between the point and Spit Buoy. Depths in the bay outside the dredged areas are reported to be up to 2.5m less than charted. It has been reported (1997) that Pelican Point has extended up to 500m to the N and to lesser amounts to the E and W.

On June 1, 1900, an islet of mud and clay was formed by volcanic action, off the NE extremity of Pelican Point, close off the shore, where depths of 14.6m previously existed. Steam was observed rising from the N side of the islet, and a very strong odor of sulphuretted hydrogen prevailed. On June 7, the entire island disappeared and soundings indicated that the original depth of 14.6m was restored. In January, 1949, numerous bubbles were observed coming to the surface in Walvisbaai, followed by clouds of mud. These disintegrated, and a smell of sulphuretted hydrogen was noted. On March 6, 1951, three small islands appeared above the surface of the sea W of Pelican Point. The first island appeared shortly before sunset, and arose from a bubbling sea. It remained for about 1 hour and then subsided beneath the surface. The other two islands were farther out to seaward and appeared about the same time. They remained until daylight faded, and by morning had disappeared.

The concentration of sulphuretted hydrogen in the vicinity of Pelican Point is at times such that pale-colored lead paints and brasswork on ships are affected.

Directions.—The entrance to Walvisbaai is difficult to make out from seaward, even when approaching from S.

Approaching from N or NW, it is recommended to sight Swakopmund first, the town of which is conspicuous, especially when the sun is shining on the roofs of its buildings, making them visible in misty weather long before the land is sighted.

Approaching from S, the buildings of the town of Walvisbaai will first be seen over the Walvis Peninsula and will give a good radar echo, and if the weather is clear, no difficulty will be experienced in entering the bay. After passing Spit Buoy, course should not be altered for the main dredged channel until the Roman Catholic Church bears 160˚. At night, lights, in range 183˚, lead through the main channel. To avoid delay in entering due to mist, it is advantageous, when possible, for vessels to arrange their arrival time off the entrance to the bay to be not earlier than noon.

As the fog is at its maximum in the early morning and forenoon, and as the early part of the night is for the most part clear, vessels can nearly always enter the bay during the night, and can proceed alongside the wharf after daybreak, even in thick weather.

Walvisbaai to Luderitz Bay

5.16 The coast between Walvisbaai and the mouth of the Orange River, 375 miles SSE, presents a most uninviting appearance. It consists of a long range of sandhills, except between Spencer Bay and Hottentot Bay, where there is a range of barren, desolate hills, 150 to 180m high, even more forbidding in aspect than the rest of the coast. Most of this coast is designated as a restricted area, being in the diamond working area.

About 3 miles SSW of Pelican Point, a coastal bank, with depths of 11m, extends W from the Walvis Peninsula for about 0.8 mile. In 1953, less water than charted was reported to exist in this area.

A wreck is charted in a depth of 34m in position 23˚00'S, 14˚22'E. A dangerous wreck, 11 miles offshore, is charted 17.2 miles SE of the light at Pelican Point and its position is approximate.

5.17 **Sandwich Harbor** (23˚22'S., 14˚29'E.), 27 miles S of Peli-can Point, is no longer a harbor, but rather a lagoon intermittently closed to the sea. It is a proclaimed bird sanctuary. Discolored water, very light in color and extending 2 to 3 miles seaward, has been observed in the vicinity of Sandwich Harbor and for a few miles S of it. The line of demarcation between it and the blue water seaward is clear and distinct. Depths 0.2 mile inside this line were found to be about 25m, sand.

The coast between Sandwich Harbor and Conception Bay, 31 miles S, is backed by shifting sand dunes, 100 to 150m high. Depths of less than 10m extend about 1 mile offshore. Conception Bay is a slight indentation affording no shelter. It is visited only by small vessels with provisions for a diamond mining settlement situated 9 miles inland.

The coast in this vicinity appears to be extending seaward. A stranded wreck (24˚00'S., 14˚27'E.), lying S of Conception Bay and some distance inland, is a conspicuous radar target. For many years, the wreck had the appearance of a ship steaming through the desert.

North Rocks lie about 30 miles SSE of the stranded wreck, off a sandy point. Black Kop, a 25m high hill, rises 5 miles N of North Rocks. Meob Bay, a small indentation, lies close S of North Rocks. A small settlement and a meteorological station are situated close S of the bay.

Black Reef lies 2.5 miles SSW of North Rocks. A 30m hill and a 25m hill stand close ESE and 2 miles ENE, respectively, of Black Reef. An 18m depth and a 9.8m depth, lie about 3 miles W and 3.5 miles SSW, respectively, of Black Reef.

5.18 **Hollandsbird Island** (Hollams Bird Island) (24˚38'S., 14˚32'E.), a 12m high rock, lies 6 miles offshore and lies 7 miles SSW of Black Reef.

Depths of less than 20m extend about 4 miles N and 6 miles SSW, respectively, of the island. Breakers were reported (1939) about 6 miles SSW of the island. A pair of heavylift shearlegs, on the N side of the island, is conspicuous from seaward. The reef is frequented by whales during July and August, and the place is the resort of seal and cormorants.

Anchorage can be obtained, in 23m, at a distance of 0.5 to 1 mile N of the island.

A shoal, with a depth of 25.6m, the position of which is approximate, lies 5 miles W of Hollandsbird Island.

5.19 An indentation, with a low sandy beach marked by patches of black rocks, is formed between the point S of Black Reef and some conspicuous white sand patches on the coast, about 25 miles farther SSE. This part of the coast is lower than the coast S of it, and is difficult to distinguish due to the heavy surf and spray which envelop it. The above-mentioned white sand patches are very conspicuous in the afternoon when the sun shines on them. The country in the vicinity is sand of a generally yellowish appearance, but the sand patches are quite white, coming to a point at the base of the hills, and spreading above in a fan shape. A flat-topped black rock (24˚57'S., 14˚49'E.) is conspicuous close off the coast, about 2 miles S of the white sand patches.

Sylvia Hill (25˚09'S., 14˚51'E.), 250m high, rises 12 miles farther S and is sharp and double-peaked. It is higher than the surrounding country and conspicuous from SW.

Easter Point (25˚18'S., 14˚48'E.) lies about 8.5 miles SSW of Sylvia Hill. East Hill, a rocky summit, lies about 2.5 miles ESE of the point. Easter Cliffs (Oyster Cliffs), 3 miles S of Easter Point, are high, rugged sandcliffs extending to black cliffs about 3 miles farther S. Breakers extend some distance off the coast N of these cliffs, and vessels should not approach this coast within 2.5 miles. The Uri Hauchab Mountains rise to an elevation of 723m, about 21 miles ESE of Easter Point.

Knoll Point (25˚28'S., 14˚50'E.), rocky, but inconspicuous, lies 11 miles S of Easter Point. The coast S of Knoll Point forms an open bay about 8 miles wide. High cliffs, with a rugged coastal range of hills behind them, lie at the S end of the bay, and extend about 5 miles S to **North Point** (25˚41'S., 14˚51'E.). North Head rises to an elevation of 262m, about 0.7 mile NE of North Point.

5.20 **Spencer Bay** (25˚43'S., 14˚50'E.) is entered between North Point and Dolphin Head, about 3 miles S. These points

are the most remarkable features on this part of the coast. During bad weather, the sea breaks heavily on the beach in the bay for a considerable distance, forming several lagoons in the hollows behind it. Whales visit the bay in July and August.

Dolphin Head, the N extremity of South Head (Sudhuk), rises steeply from the sea to an elevation of 185m. It has the appearance of an island when seen from a few miles N. A stranded wreck lies in a sandy bay close E of Dolphin Head.

Mecury Island (Mercury Island), a bleak, guano-covered island, 38m high, lies on the W side of Spencer Bay, about 0.4 mile N of Dolphin Head. The settlement consists of a few wooden houses built on concrete pillars.

The rocky N part of the island is separated from the main part of the island by a chasm through which the surf surges and which is crossed by a planked bridge. Waves at times beat against the shores of the island with indescribable fury. A shoal, with a depth of 6.7m, rock, extends from the NE side of the island, about 0.2 mile E of the N end of Mecury Island.

The other sides of the island are fairly steep-to. A bank, with depths of less than 9.1m, extends 0.5 mile from the mainland E of Mecury Island, leaving a channel about 275m wide, with depths of 10.5m, between it and the shoal extending from the island. Depths of over 7.5m lie about 0.2 mile off the mainland E and S of Mecury Island.

The sea has been observed to break heavily about 0.5 mile NE of Mecury Island, but only in bad weather with a very heavy swell, although there is a charted depth of 14.6m in this position.

Anchorage.—Spencer Bay is sheltered from SSW winds by Dolphin Head, though these winds may prevail during violent gales. The bay can be entered N or S of Mecury Island. The best anchorage, in 11m, lies about 0.3 mile E of the N extremity of the island, care being taken to avoid the 6.7m shoal. Vessels loading guano lie at a distance of a little over 0.2 mile off the coast of the island. It is inadvisable for vessels to anchor on the S side of the bay due to the heavy W swell.

Caution.—Due to the possible existence of uncharted shoals and rocks, vessels should exercise extreme caution when navigating within 6 miles of the coast between Easter Point and Dolphin Head.

5.21 The coast for a distance of 2 miles S of Dolphin Head consists of rugged cliffs, terminating in a point which, when seen from S, is in the form of a rocky pyramid, but from W appears flat-topped.

Saddle Hill (25˚54'S., 14˚55'E.), about 11 miles SSE of Dolphin Head, is sharp-peaked and rises immediately over the coast. It can easily be seen in clear weather from Ichaboe Island, about 23 miles farther S. Saddle Hill has two peaks, North Peak and South Peak, but appears as one from N, and is the highest land in the vicinity.

The coast between Saddle Hill and the entrance to Hottentot Bay, about 14 miles S, consists of a sandy beach, rising a short distance inland to a level range of sandhills, 150 to 200m high. North Rocks lie about 8 miles SSE of Saddle Hill, and a conspicuous rock lies about 4 miles farther SSE.

Hottentot Bay lies E of **Hottentot Point** (26˚08'S., 14˚56'E.). The latter point is the W extremity of the Hottentot Peninsula, which is joined to the mainland by a low, sandy neck.

The peninsula, partly rocky and cliffy, appears as a succession of sandhills of about equal height. From W, it shows up well and is visible at a distance of 10 to 12 miles. From S, it appears as two low, bare, and isolated rocks, the N of which is slightly higher. A pyramidal, framework beacon, 12m high, stands at an elevation of 34m on the higher of the two dark summits of the peninsula.

Anchorage.—There are depths of less than 5.5m within 0.5 mile of the shore in the SW part of Hottentot Bay, but secure anchorage can be obtained, in 7m, good holding ground, sand and mud, about 1.1 miles ENE of the beacon.

Caution.—The shores of Hottentot Bay are a prohibited area because obouysf diamond deposits located there.

Between Hottentot Point and the Orange River are many Marine Mining Vessels (MMV). Diamond mining barges are usually moored to four anchors, which may or may not be marked by unlit buoys. Vessels should keep at least 1,500m away from them.

A shoal, with a least known depth of 7.7m, lies about 1.2 miles N of the beacon on the Hottentot Peninsula. The sea breaks over the shoal with a heavy swell. There are tide rips over the shoal and between it and the peninsula.

A shoal, with a depth of 8.8m, lies about 0.5 mile N of Hottentot Point. It breaks in a heavy swell.

Mooring buoys, designated B1, B2, and B3, are situated 1.5, 2, and 2.7 miles NE, respectively, of Hottentot Point.

5.22 The coast between Hottentot Point and Danger Point, about 8 miles S, is generally rocky, with occasional sandy beaches. Breakers extend about 0.3 mile offshore in an unbroken line. Some of the points are marked by rocks and are prolonged by submerged reefs which extend a considerable distance offshore in places.

Gallovidia Reef (26˚10'S., 14˚56'E.), with several parts awash and others above water, extends about 1.5 miles S from a point 1.2 miles SSE of Hottentot Point. A rocky islet lies at the S end of the reef. The reef lies nearly in the direct track from Hottentot Bay to Douglas Bay, and care should be taken to keep in depths of not less than 30m, as the sea has been observed to break heavily in depths of 14.6m.

A shoal, with a least depth of 10m and on which the sea breaks in a heavy swell, lies 1.5 miles SSW of the rocky islet, at the S end of Gallovidia Reef.

Danger Point (26˚16'S., 14˚57'E.) is cliffy; a broken and cliffy coast extends 0.6 mile SSW to Wreck Point, and then 0.8 mile farther SSE to another cliffy projection. The sea breaks heavily all along this stretch of coast.

A shoal, with depths of less than 5.5m, extends 0.1 mile from Wreck Point; a detached shoal with a depth of 4.5m, lies 0.3 mile NW of the point. There is a depth of 6.4m, rock, 0.3 mile WSW of Wreck Point. Good radar returns have been reported from Wreck Point.

5.23 **Ichaboe Island** (26˚17'S., 14˚56'E.), about 0.7 mile SW of Wreck Point, is flat and mainly composed of granite. Its highest point, at its SW end, is 12m high, and marked by a pole beacon, which is difficult to distinguish from a distance. A settlement with a jetty is situated on the NE side of the island. There is a flagstaff at the settlement.

Foul ground and reefs, upon which the sea usually breaks, extend 0.3 mile N and W, and 0.1 mile S of the island. A rocky outcrop, called Little Ichaboe, lies 0.3 mile off the W side of the island.

Depths of less than 5.5m extend about 100m off the E side of the island. There is a depth of 6.4m about 0.2 mile NE of the settlement.

A channel, 275m wide, with depths of 10m, lies between the above depth and the rock WSW of Wreck Point. Ichaboe Island is the home of a colony of cormorants. The guano collecting season is in April and May when all the birds have departed.

5.24 Douglas Bay (26˚18'S., 14˚57'E.) is entered between Wreck Point and Douglas Point, 1.5 miles farther S. Rocky Point, 0.4 mile NE of Douglas Point, divides the S part of the bay into two smaller bays. The S bay is surfbound, and a good landing place is located E of Rocky Point. Breakers extend 0.3 mile N from Douglas Point, and 0.1 mile NW of Rocky Point.

An isolated shoal, with a depth of 12.8m, lies about 0.7 mile WSW of Douglas Point.

Anchorage.—Anchorage, consisting of sandy patches among rocks, can be obtained, in 10m, about 0.2 mile E of the settlement, or in about 13m, about 0.3 mile ENE of the S end of Ichaboe Island. In the first location, vessels are well-sheltered from the heavy swell which sets in, but NE of the island the rollers are dangerously heavy. Rollers come in without giving any previous warning, and it is not usual for the approaches on either side of the island to break across, leaving comparatively smooth water at the anchorage. A current usually sets N through the anchorage at a velocity of about 1 knot.

Directions.—Vessels approaching Douglas Bay between 26˚15'S and 26˚25'S should be able to make out the mountains inland, which should be steered for on a SE bearing. Vessels can pass either N or S of Ichaboe Island, giving it a berth of at least 0.4 mile. The S passage is preferable, as the N passage is narrower and the sea breaks in adverse weather for several miles N of the island.

5.25 Kegelberg (26˚25'S., 15˚06'E.), a conspicuous conical hill, 39m high, and consisting of white quartz, lies 10.5 miles SE of Douglas Point. The hill lies 0.5 mile N of the N point of Boat Bay, at the S end of a low chain of hills. Nearly all of the intervening coast is fringed by breakers.

Marshall Rocks, composed of dangerous and extensive reefs marked by heavy breakers, lie up to 3 miles S of Douglas Point, and extend up to 1.5 miles offshore. Breakers extend in a SE direction for about 2.5 miles from the SE end of Marshall Rocks, and a bank, with depths of 13 to 17m, extends in the same direction for another 2 miles. Staple Rocks lie with the highest rock, 9m high, about 1 mile E of the SE end of Marshall Rocks.

Anichab Rocks, about 3.5 miles ESE of Staple Rocks, are low and break 0.5 mile offshore.

Boat Bay Rocks, marked by breakers, extend about 1 mile W of the N entrance point (26˚25'S., 15˚05'E.) of Boat Bay.

Boat Bay lies between the above-mentioned point and a rocky headland, 67m high, nearly 2.5 miles SSE. Some huts, in ruins, lie E of the headland.

The bay is clear of dangers and anchorage can be taken, in 7 to 11m, in the S part of the bay, but vessels should proceed to sea when W or N winds threaten.

Dumfudgeon Rocks, two low islets, lie about 2.2 miles S of Boat Bay; the outer islet lies about 0.7 mile offshore. Dagger Rocks, about 2.5 miles farther SSE, extend 0.2 mile offshore. An 18m patch lies 1.5 miles W of Dagger Rocks.

Luderitz Bay (26˚39'S., 15˚09'E.)

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5.26 Luderitz Bay is entered between North East Point (26˚35'S., 15˚09'E.) and Diaz Point, 4.5 miles SW. There are several anchorages in the bay, but they are exposed to the swell, which, being deflected by the contour of the land, enters the bay from NW. Seal Island, Penguin Island, and Shark Island lie off the E side of the bay, from N to S, respectively.

Robert Harbor is entered between Penguin Island and Shark Island. The latter island is connected to the mainland by a causeway. Menai Creek, in the S part of Robert Harbor, is shallow, but a dredged channel leads to the two jetties at the town of Luderitz, at the head of the creek.

Shearwater Bay, in the S part of Luderitz Bay, is entered between Diaz Point and Angra Point, 2 miles ENE; landing can be made in it in three places.

Winds—Weather.—Strong SSW to SW winds are almost continuous for 10 months of the year. It is usually calm in the early morning. Morning fog often occurs outside the harbor area and is most frequent between January and April. At times, desert sand is blown about in large quantities, filling the air with minute particles which take a long time to subside.

Tides—-Currents.—The tidal rise at Luderitz is 1.4m at MHWS and 1m at MHWN. Currents are negligible in Menai Creek, but a tidal current sometimes occurs during the flood, running down the E side of Shark Island, and may cause difficulty to vessels berthing.

Depths—Limitations.—A channel, 60m wide, leading to the jetties off Luderitz, and a turning basin off the jetties, were dredged to 8.05m. The main jetty at Luderitz has a dredged depth of 6m alongside its W side for a distance of about 180m from its head, and alongside its E side for a distance of about 140m. Vessels with lengths of less than 105m and drafts of less than 6m can be accommodated at the main jetty.

The Timber Jetty, close E of the main jetty, is 168m long and has a depth of 3.5m alongside.

A new General Purpose Quay has been constructed in the harbor. The quay is 500m long. It has three berths, with depths alongside ranging from 4.6 to 8.6m.

A boat jetty extends into the S part of Robert Harbor, 0.6 mile NNE of the main jetty, in Menai Creek.

North Reef, 2.7m high, lies 0.2 mile SSW of North East Point. There is a depth of 3.7m about 0.2 mile S of North Reef.

A shoal, with a depth of 6.4m, extends 0.2 mile seaward between Diaz Point and the NW extremity of this peninsula.

Angra Rock lies on a reef which extends 0.5 mile N of Angra Point. The sea breaks between the rock and the point. A rock, awash, and a rock, with a depth of less than 1.8m, lie 0.3 mile and 0.4 mile, respectively, N of Angra Point. Vessels should

not pass between Angra Point and the lighted buoy moored 0.6 mile NNW of the point.

Seal Island, 43m high, round-topped, and dark, lies about 0.5 mile S of North East Point. A mussel culture area extends 0.3 mile E of the E coast of Seal Island. Vessels should keep well-clear of the area due to the presence of unlit floating platforms and booms. A stranded wreck lies at the SE end of Seal Island.

Penguin Island, 49m high and rocky, lies 0.5 mile S of Seal Island. Penguin Island is fringed by a reef which extends 150m from its N, W, and S ends. Tiger Reef, awash, lies between the N end of Penguin Island and the mainland E. A lighted buoy is moored off the NE side of the reef. A rock, with a depth of less than 1.8m, lies 0.1 mile N of the N end of Shark Island.

Aspect.—North East Point (26˚35'S., 15˚09'E.), bold and rocky, lies about 3 miles S of Dagger Rock.

Nautilus Hill, 130rn high, lies 0.7 mile E of the S end of Penguin Island and appears to be the highest land in the vicinity. A radio mast is situated 0.2 mile NW of the hill.

Diaz Point (26˚38'S., 15˚06'E.) is the N extremity of a rocky peninsula. A light is shown 0.2 mile S of the point; a signal mast stands close N of the light. A beacon, consisting of a marble cross, stands about 0.2 mile WNW of the light, but it is difficult to distinguish.

A beacon, consisting of white tripod with framework topmark, stands on the 38m high summit 0.2 mile SSE of Angra Point. A lighted buoy lies 0.6 mile NNW of Angra Point. Beacons are situated 0.1 mile ENE and 0.1 mile ESE of Angra Point Beacon. The area within 0.1 mile offshore between these beacons is foul.

Shark Island, 0.5 mile S of Penguin Island, is marked by a light near its center. A lighted buoy is moored 0.2 mile N of Shark Island. A conspicuous church spire, nearly 1 mile S of Shark Island Light, is a useful mark in approaching the anchorage in Luderitz Bay.

Lights, in range 120˚, about 0.6 mile E of the N end of Shark Island, lead into Robert Harbor. The dredged channel and turning basin in Menai Creek are marked by buoys.

Pilotage.—Pilotage is compulsory. Pilots board 1 mile NNW of Angra Point and are available between 0400 and 1600. The pilot will board 0.7 mile NE of Angra Point in poor weather. In an emergency, vessels will be accepted at any time. A tug and launch operate as pilot vessels; both have black hulls and yellow funnels.

Regulations.—A Port Information Service is maintained at Luderitz Bay. Vessels equipped with VHF are requested to establish contact with the harbormaster not less than 1 hour before arrival. Vessels arriving after hours should report their ETA by VHF to the signal station at Diaz Point Light.

Vessels in the outer anchorage should keep a listening watch on VHF channel 16.

Anchorage.—Luderitz Harbor is a narrow inlet E of Angra Point, but only the outer part is suitable for anchoring.

Shearwater Bay provides good shelter from all but N and NW winds, but vessels must be prepared to get underway at short notice due to sudden squalls. There is good anchorage between Angra Point and Shark Island. Anchorage can be taken, in 10.7m, with Shark Island Light bearing 136˚ and with Angra Point bearing 266˚ . Anchorage according to draft can be taken farther inside Luderitz Harbor.

The holding ground in Robert Harbor is poor in places, and vessels have dragged anchor there, but a berth reported safe for vessels, with a draft of up to 7.3m, good holding ground, clay, with a swinging radius of about 0.2 mile, lies on the range line, with Shark Island Light bearing 214˚, distant about 0.5 mile.

Anchorage can also be taken on the range line, with Shark Island Light bearing 225˚, distant 0.5 mile. Another anchorage lies 0.2 mile WSW of Angra Peguena Jetty, which is situated about 0.5 mile E of the S end of Penguin Island.

A considerable NW swell is felt at times. With a swell setting into the bay, anchorage at the N end of Robert Harbor is recommended. Shark Island Light is obscured in Robert Harbor.

North Harbor, entered N of Seal Island, provides anchorage, in 7m. Vessels of light draft can anchor leeward of Seal Island.

Directions.—Luderitz Bay may be entered without difficulty. Diaz Point can be rounded at a distance of 0.4 mile. Vessels must pass N of the lighted buoy moored off Angra Rock, and a course set for Robert Harbor or the anchorage in Luderitz Harbor. At night, Angra Rock and the reef off Penguin Island may be cleared by keeping in the white sector of Shark Island Light.

Vessels proceeding to the anchorage in Luderitz Harbor, after passing the lighted buoy moored off Angra Point, can steer to pass 0.5 mile NE of the point, and, when Angra Point beacon bears 246˚ in range with the beacon ENE of it, alter course to about 170˚, and anchor when Angra Point beacon bears 290˚, in range with the beacon ESE of it.

Vessels bound for Robert Harbor enter with the range lights in line, bearing 120˚.

Luderitz Bay to the Orange River

5.27 The coast between **Diaz Point** (26˚38'S., 15˚06'E.) and Chameis Baai, 81 miles SSE, is indented with many small bays enclosed by rocky headlands. The interior is desert country, consisting of sandy valleys with sparse scrub vegetation lying between ranges of sandstone and quartzite hills.

Caution.—Numerous mining vessels operate off the coast between Luderitz Bay and the Orange River. They moor with a spread of five anchors; unlit anchor buoys extend up to 1,500m from the vessels. The approximate positions of these vessels are broadcast daily over NAVTEX. These vessels, which should be given a wide berth, move constantly within their anchor spread.

5.28 Guano Bay, close SW of Diaz Point, is sheltered from S and SW winds by Halifax Island, 37m high, and Halifax Reef, parts of which are above water, extending about 0.5 mile NNW of the island. Halifax Island appears as a range of black hummocks from S and has been mistaken for Diaz Point.

Anchorage can be taken, in a depth of 9m, about 0.3 mile NE of the flagstaff on the NE end of Halifax Island. Depths decrease rapidly within 0.3 mile of the shore of the bay.

Grosse Bay (26˚45'S., 15˚06'E.), 6 miles S of Halifax Island, has a sandy coastline alternating with rocks. It affords no shelter, except to small vessels in a N wind, as the bottom is foul.

Albatross Peak, a double-headed peak, 180m high and reddish in color, rises 2.5 miles E of Grosse Bay. It forms a good mark from S.

Wolf Bay, providing no protection, lies 4 miles SSE of Grosse Bay. North Long Island, low-lying and almost divided into two parts, lies 0.5 mile offshore, close S of the entrance to Wolf Bay. South Long Island, 0.5 mile farther S, lies 0.1 mile off a small point on the coast.

Zwei Point (Zwei Spitz) (26˚52'S., 15˚09'E.), 2 miles SE of South Long Island, is a prominent, table-topped hill. A submerged reef lies 0.4 mile offshore, 1.3 miles S of Zwei Point. The cliffs in this vicinity are composed of cream-colored rock, in contrast to the prevailing gray granite.

Elizabeth Point (26˚55'S., 15˚11'E.), low and rocky, lies 4.5 miles SSE of Zwei Point. A dangerous reef and heavy breakers extend some distance S of the point, and the ruins of an old mining town, situated N of the point, are conspicuous when viewed from the W.

Zweikuppen (Saddle Mount) (26˚56'S., 15˚20'E.) rises to an elevation of 358m about 8 miles E of Elizabeth Point. Dreizack Berg, 463m high, lies 6 miles SE of Zweikuppen. Two peaks, known as The Paps, behind these hills, are conspicuous in clear weather, and when in range bear 053˚.

Elizabeth Bay is 3.5 miles wide between Elizabeth Point and the reefs extending N of Possession Island. The bay is backed by a low plain with shifting sandhills, behind which the country is hilly.

5.29 Possession Road (27˚01'S., 15˚13'E.) lies between Possession Island and the mainland. Possession Island, 5 miles S of Elizabeth Point, rises to an elevation of 20m in its S part. The coast of the island is rocky and nearly perpendicular. The island is easily identified when approached from either N or S. When seen from a short distance S, it appears as a group of islets, as it has several summits joined by low land.

There is a small settlement on the E side of the island, 0.5 mile from its N end. There is a flagstaff and small pier at the settlement. Three islets lie close off the N end of Possession Island, and North Reef, submerged and marked by breakers, extends 1 mile NNW of the island.

Kreuz Shoals consists of two groups. One group, with a least depth of 3.6m, lies 1.3 miles NE of the N end of Possession Island. The other group has a least depth of 2.7m at its S head, about 0.7 mile NE of the N end of the island, and extends 0.5 mile farther N, with the remaining depths not less than 7.3m. Possession Rock, with a depth of 0.9m, lies 0.7 mile SE of the N end of Possession Island, and 0.3 mile E of the shore.

South Reef, marked by breakers and incompletely surveyed, extends 1.5 miles S of the S end of Possession Island and should be given a berth of at least 2 miles.

Anchorage.—Good anchorage, in smooth water, can be taken by small vessels, in 8m, about 0.5 mile NNE of the flagstaff at the settlement. It is reported that the seabed in approximate position 27˚00'S, 15˚13'E is covered in kelp and does not provide good holding ground.

Directions.—The best approach to the anchorage is from S, giving the S end of Possession Island a berth of at least 2 miles, until the N extremity of the island is open E of the SE end of the island. Then the anchorage can be steered for, care being taken to pass E of Possession Rock. If approaching from N, give the islets off the N end of Possession Island a berth of at least 1 mile, and when clear of the 3.6m patch the anchorage can be approached with the flagstaff bearing 225˚. Another approach would be with the flagstaff bearing 210˚, which leads between the 2.7m and 3.6m shoals. These directions were written from scant detail and should he used with caution.

5.30 Prinzenbaai (Prince of Wales Bay) (27˚05'S., 15˚15'E.) lies 5 miles SSE of Possession Island. Foul ground extends 0.4 mile NNW of the SW entrance point of the bay, and a rock, with a depth of less than 1.8m, lies 0.5 mile NW of the same point.

Anchorage, in depths of 8 to 12m, can be obtained by small craft 0.3 mile NE of the N edge of foul ground.

Albatross Rocks (27˚07'S., 15˚14'E.), a ridge of volcanic islets and above-water rocks, lies about 0.8 mile off the coast. The S and largest islet is prominent against the lighter-colored mainland when viewed from seaward. Foul ground extends about 0.3 mile N and 1.5 miles S of the rocks. The foul ground extending S from the rocks is marked by breakers.

Albatross Channel, lying between Albatross Rocks and the mainland, appears to be clear, but has a depth of 6.7m in its N entrance.

Jammerbaai, 4 miles S of Prinzenbaai, has a conspicuous mining building, in ruins, in its S part. Pomona Island, 15m high, lies 1 mile farther SSW. A submerged rock lies between the island and the mainland. Anchorage can be taken by small vessels, in a depth of 10m, good holding ground, off the N end of the island.

The coast from abreast of Pomona Island to Bakers Bay, 31 miles SSE, is most desolate in appearance, without the least sign of vegetation. It is bordered about 0.5 mile offshore by numerous islets and reefs. There are no known dangers beyond 1 mile offshore, but it is prudent to remain at least 2 miles off the coast.

Tafelberg (27˚16'S., 15˚23'E.) rises to an elevation of 214m about 8 miles SE of Pomona Island.

Black Point lies 6 miles SW of Tafelberg. A dangerous wreck lies 1.8 mile W of Black Point. Black Rock, 10m high, about 5 miles SSE of Black Point, lies close S of the N entrance point of Van Reenan Bay. The bay affords no shelter.

5.31 Bogenfels (Arch Rock) (27˚28'S., 15˚24'E.) is a large rock, 50m high, projecting from the coast, in the shape of an archway. It is one of the most remarkable features on the coast of Namibia. From W through N, it is not at all distinct, but when bearing about 010˚ it shows up well against the light-colored coast. Driemasterbaai is entered between Driemastergrat, 6 miles SSE of Bogenfels, and Driemaster Huk, 1.5 miles farther SSE. The shore of the bay is foul and breakers extend 0.2 mile offshore. The recommended anchorage is in 11m in the S part of Driemasterbaai.

False Plum Pudding is a rocky projection 3 miles SSE of Driemaster Huk. Rocks, partly visible at LW, extend 1 mile off the shore of the bay close NW of False Plum Pudding.

Plum Pudding Island, 13m high, lies 0.3 mile offshore, 2 miles SSE of False Plum Pudding.

Black Sophie Rock, 3m high, lies 0.4 mile farther SSE. Foul ground and breakers surround these islands and extend to the coast.

5.32 Bakers Bay (27˚40'S., 15˚31'E.) is entered between Black Sophie Rock and Sinclair Island, 15m high, 0.9 mile S.

The latter island is almost joined SE to Lion's Head, the S entrance point of Bakers Bay. The depths in the bay decrease from 14.6 to 7.3m, sand, the latter depth being found outside the breakers, about 0.3 mile offshore.

Anchorage can be taken by small vessels. in about 12m, in the middle of the bay, with fair shelter from S winds. Sparrow Hawk Islet lies in the middle of a small bay between Lion's Head and Needle Point, about 0.5 mile S. Durnburg Bay is entered between Vohsenberg, 30m high, about 0.5 mile S of Needle Point and Kapp Durnburg, about 1.5 miles farther S. The bay appears to be full of breakers, and there are several rocks and islets in it, including the Little Roast Beef Islets.

Copper Mount rises to an elevation of 50m about 1 mile E of Kapp Durnburg. Dunkle Wand Spitze, 2.5 miles SSE of Kapp Durnburg, is fringed with breakers, and a small islet lies in the bight on its N side. It has the appearance of a dark wall. A green precipice is charted 2.2 miles farther SE.

Nordfels is one of a group of rocks lying 0.2 mile offshore, 4 miles SE of Dunkle Wand Spitze. Sudfels, another group of rocks, lies close offshore, 2.5 miles farther SE.

A 5.5m patch lies 1 mile offshore, about 1.5 miles W of Sudfels; an 18m depth lies nearly 2 miles SW of Sudfels.

Chameisbaai lies between Chameis Head (27˚52'S., 15˚39'E.), 3 miles SE of Sudfels, and Panther Huk, nearly 4 miles SSE. Schlangen Mount rises to an elevation of 81m about 1 mile E of Panther Huk. Chameis Reefs, consisting of North Reef and South Reef, lie in the approach to Chameisbaai. North Reef, which breaks and has a least depth of 7.9m, lies 1.7 miles SW of Chameis Head. South Reef, which sometimes breaks, has a least depth of 14m about 2 miles SSE of North Reef. Panther Reef, which dries 0.5m and is steep-to, lies 0.7 mile N of Panther Huk. Stranded wrecks lie close N of Chameis Head and at the SE end of Chameis Bay.

5.33 The coast between **Panther Huk** (27˚56'S., 15˚40'E.) and the mouth of the Orange River, about 60 miles SE, is an almost unbroken line of sand, in contrast to the coast farther N. With few exceptions, the coastal hills are low and inconspicuous. Intense diamond mining is under way in this area, with mine dumps, mine headgear, and pump houses along the coast. A shoal, with a depth of 57m, was reported (1956) to lie 14 miles SW of Panther Huk.

Boegoeberge (27˚54'S., 15˚56'E.), 578m high, has a radio mast on its summit, about 14 miles E of Panther Huk. Nordlicher-Tafelberg, 67m high; Grosse Tafelberg, 79m high; and Tafelberg-Suid, 84m high, lie close to the coast, between 4 and 8 miles SE of Panther Huk.

Kerbe Huk (28˚14'S., 16˚00'E.), 54m high and off which there is a stranded wreck, lies 25 miles SE of Panther Huk. A tower, with an elevation of 16m, lies 5 miles SE of Kerbe Huk. A lighted buoy (waverider) is moored 8 miles offshore, 12 miles S of the same point. A conspicuous sandhill, 100m high, rises near the coast 8 miles SE of Kerbe Huk.

Schakalberg (28˚09'S., 16˚35'E.), rising to an elevation of 598m, can be seen about 28 miles inland from the vicinity of the sandhill.

5.34 Oranjemund Oil Terminal (28˚34'S., 16˚22'E.) lies 6 miles NW of the mouth of the Orange River, and about 3 miles WSW of the town of Oranjemund (Orange Mouth). A submerged pipeline extends 1.7 miles SW from the terminal. The seaward end of the pipeline is marked by two buoys. The town of Oranjemund is a well laid out town, with excellent amenities despite the surrounding desert. The inhabitants of the town are nearly all connected with the diamond mining industry. There is a small airfield close SE of Oranjemund.

Tides—Currents.—The prevailing current sets NW at 0.5 knot and the swell is generally from the SW.

Depths—Limitations.—The oil berth can accommodate tankers of up to 183m in length with a draft of 10.7m. Berthing is done only during daylight hours, but unberthing can be done at any time. Tankers are berthed on a S heading, riding to two anchors, and moored astern to three mooring buoys which are situated 150m N of the seaward end of the pipeline. A fourth mooring buoy, 100m S of the seaward end of the pipeline, is for a breast line from the port bow of the vessel.

Aspect.—Lights, in range bearing 043˚30', lead to the oil berth. Oil tanks stand 0.2 mile ENE of the front range light; however, the lights are only shown on demand or when a vessel is expected at the terminal. A lighted buoy lies 6.5 miles NW of the range light. A radio mast, exhibiting a fixed red obstruction light, stands in the town of Oranjemund.

Pilotage.—A berthing master will board 2 miles SW of the oil berth. The pilot boat is equipped with VHF and radiotelephone. Advance notice of arrival should be given through the ship's agents 3 days in advance and again 24 hours in advance. Port Control should be notified of the vessel's ETA 1 hour in advance.

Regulations.—Engines must be kept on notice while the vessel is in the oil berth.

Caution.—Vessels should remain in depths of more than 20m to avoid unlighted mooring buoys.

Caution should be exercised due to the possibility of the existence of uncharted rocks and shoals within the territorial waters.

The Orange River to Port Nolloth

5.35 The **Orange River** (28˚38'S., 16˚28'E.), one of the largest rivers in Africa, crosses nearly the whole of the S part of the continent, flowing W for about 1,000 miles. The mouth of the Orange River is closed during dry periods by a sand bank, nearly 0.7 mile long which is breached at varying points when the river is in flood. The banks on both sides of the river are fertile. Off the mouth of the Orange River, silt from the river has covered the rock bottom and formed an even gradient out to depths of 100m. Discolored water of a light green hue occurs frequently off the mouth of the Orange River for distances of up to 50 miles.

Caution.—Numerous mining vessels operate off the coast between the Orange River and Port Nolloth. They moor with a spread of five anchors; unlit anchor buoys extend up to 1,500m from the vessels. The approximate positions of these vessels are broadcast daily over NAVTEX. These vessels, which should be given a wide berth, move constantly within their anchor spread.

Between the Orange River and Port Nolloth are numerous prospecting trenches dug at right angles to the coast. There are also many fairly-high mine dumps and well-lit mine structures. In some places, the coastline has been pushed out to sea for a

considerable distance by dikes; the enclosed area is then pumped out and the seabed is cleared to the bedrock to recover alluvial diamonds.

Alexander Bay (28˚40'S., 16˚31'E.) lies 3.5 miles SE of the mouth of the Orange River. Alexander Bay Peak rises to a summit of dark rock, 122m high, 1 mile E of the head of the bay, and is a good landmark.

Tripp Shoal, a rock with a depth of 5.5m, lies 1 mile WSW of the N entrance point of Alexander Bay. It usually breaks. A depth of 6.7m, which seldom breaks, lies 0.5 mile WNW of Tripp Shoal.

Anchorage off Alexander Bay is not safe, as the coast is exposed to the prevailing S wind. There is occasionally a S set off the bay, but it is easily detected by the presence of discolored water from the Orange River.

Kaap Voltas (28˚43'S., 16˚33'E.), low and rocky, lies about 3.5 miles SE of Alexander Bay. The intervening coast is low, sandy, and desolate. Peacock Bank, with a least depth of 16.7m, lies 3.5 miles WSW of Kaap Voltas. Peacock Roadstead lies in the bight, 2.5 miles wide, S of Kaap Voltas. The shores of the bay are backed by hills sparsely-covered with low scrub, and by mountains farther inland. The shore in the S part of the bight is a sloping, rocky cliff which affords a certain amount of shelter from the prevailing S wind and swell. There is a long sandy beach, N of the cliffs.

Peacock Roadstead can be easily recognized by The Twins. Boegoeberg-Noord, 131m high, and Boegoeberg-Suid, 161m high, are conspicuous about 1 and 2 miles, respectively, SE of the S entrance point of the bight, and rise abruptly from the level ground close within the S entrance point. During the survey of the coast in 1955-56, it was often found that with the S wind blowing normally, at about force 4 to 5 a few miles from the coast, inside Peacock Roadstead it would be force 6 to 7, apparently due to local conditions. It has been stated that rollers sometimes break as far out as the line joining Alexander Bay and Harrison Cove, an indentation in the SE part of the bight.

The depths in Peacock Roadstead are regular, deepening from 7.3m close under the cliffs to 26m at a convenient distance for larger vessels to anchor. The bottom is sandy mud. The best anchorage, for small vessels of up to 76m in length, is in the small indentation S of Harrison Cove.

5.36 Homewood Cove (28˚46'S., 16˚34'E.), close inside of and W of Boegoeberg-Noord, is nearly circular, with receding sides rising to heights of 18 to 24m. Small craft with local knowledge may find shelter, in 3.7m, on the S side of the cove. Collins Reef, with a depth of 5.4m, and on which the sea breaks, lies 0.8 mile SSW of the entrance to Homewood Cove.

A reef, with a depth of 6.6m in its outer part and on which breaks in a heavy swell, extends 1 mile offshore, and 2 miles SW of Boegoeberg-Suid. Another similar reef, with a depth of 6.7m near its outer end, 4 miles S of Boegoeberg-Suid, extends 1 mile SW from the white sand dunes.

Wreck Point (28˚52'S., 16˚36'E.), backed by sand dunes, lies 7 miles SSE of Homewood Cove. Soco Reefs, which break heavily, extend 1.5 miles offshore, 2 miles SE of Wreck Point.

Holgatrivier, generally dry, empties into the sea 9 miles SE of Wreck Point. Rocks extend 0.5 mile SW from the N entrance point of the river. The river valley is fairly conspicuous when viewed from the SW.

The coast between Holgatpunt and Port Nolloth, 17 miles SSE, is fringed by rocks from 0.2 to 1 mile offshore. A rock, with a least depth of 8.5m and which breaks in a heavy swell, lies 2 miles offshore, midway between Holgatpunt and Jackals Pit, a small cove, 7 miles SE.

Cliff Point (29˚07'S., 16˚49'E.) lies 1 mile S of Jackals Pit. A dangerous rock, with a least depth of 3.6m and which breaks in a heavy swell, lies 2.5 miles SW of Cliff Point, 1.8 miles offshore.

Caution.—The shore between Cliff Point and Port Nolloth, 9 miles SSE, should not be approached closely.

5.37 Port Nolloth (29˚15'S., 16˚52'E.) (World Port Index No. 46730) lies between North Point and South Point, 1.7 miles SSE. North Point, 10m high, is easily recognized by the prominent buildings of the fisheries factory near its extremity. Owen Island, 3m high and bordered by rocky ledges, lies close S of South Point. North Point and South Point are both marked by heavy breakers and fringed by reefs.

The port limits are enclosed by lines extending for a distance of 3 miles 245˚ from North Point, then for 4.2 miles on a line of bearing 155˚, then a bearing of 065˚ to Gooapunt. The latter point lies 2.5 miles SSE of South Point. The coast for 1 mile NW of Gooapunt consists of rocky ledges.

The port is shallow and suitable only for light-draft coasters. It is formed by a reef, which dries in places, and extends 0.8 mile NNW of Owen Island. The town of Port Nolloth is built on the low-lying land E of the harbor and is fairly prominent.

Winds—Weather.—The prevailing winds are from the SE.

Tides—Currents.—The tidal rise at Port Nolloth is 1.6m at MHWS, and 1.1m at MHWN. The current outside the reefs usually sets N at a velocity of 0.5 to 1 knot. Fresh and sustained N winds check the current, and will reverse the current if persisting for several days. The reversed current normally attains a velocity of no more than 0.5 knot, but a velocity of 3 knots has been reported. The current in the port attains a velocity of 0.5 knot to 3 knots, depending on the strength of the SW wind. It enters through the reefs close NW of South Reef, and after passing through the inner anchorage, runs out across The Bar and the S part of the N reef in a NW direction, losing some of its strength as it crosses them. It is reported that the strength of the current depends on the size of the swell, and that during a heavy swell, the current may run strongly N through the harbor, meeting a weaker S current from the N part of the harbor. Both currents then unite and flow seaward over The Bar.

Depths—Limitations.—A depth of 2.1m lies close within depths of 15m, 1 mile NW of North Point. North Ledge, 3m high, 0.4 mile SSE of North Point, lies on a reef extending 0.5 mile SSE of the point. North Blinder, a shoal with a depth of 3.3m and which breaks heavily, lies 0.3 mile SSE of North Ledge. Black Jacob Rock, 2.3m high, lies 0.3 mile within the N extremity of the reef extending 0.8 mile NNW of Owen Island.

Robbe Islet, 275m ENE of Black Jacob Rock, is 2m high and surrounded by drying rocky ledges, and forms good protection to the anchorage off the town. South Blinder, a shoal which breaks and has a depth of 2.1m, lies 0.2 mile N of Black Jacob

Rock. Inner Blinder, a dangerous rocky shoal, which dries 1.2m, lies 275m N of Robbe Islet.

The entrance to Port Nolloth lies between North and South Blinders, but the passage, which is 300m wide, is obstructed by The Bar, a rocky shoal having a least depth of 3.1m. The sea breaks heavily on both sides of the channel with a swell, and frequently breakers extend across the passage, preventing vessels from entering or leaving for as long as three consecutive days.

The channel, which leads S to the quay and anchorage, was reported (1990) to be dredged to a depth of 3.3m. A long and narrow shoal, with a depth of 1.2m, lies between Inner Blinder and the dredged channel. The head of the L-shaped pier is 66m long, with a depth of 3.6m alongside. Vessels of up to 1,100 dwt, having a maximum length of 61m and maximum draft of 3.6m, can be accommodated. It has been reported (1999) that there is less water than charted alongside the pier and the northernmost 25m of the pier is unusable.

There are two private wharves, one of which accommodates fishing vessels and the other used for the berthing of diamond-prospecting vessels.

Aspect.—The Bar Light is situated 1 mile SE of North Point. Port signals are shown from the light when the bar is closed.

Port Nolloth Light, about 100m distant, bearing 066 from The Bar Light, is shown from a triangular daymark, point down, surmounted on a framework tower. A radiobeacon and racon are situated at the tower. A radio mast, 30m high, stands close S.

"F" Beacon, conical and black, with a triangular topmark of red and white stripes, lies 0.3 mile, 066˚ from Port Nolloth Light. The two lights and the beacon, in range 066˚, lead over The Bar.

The square tower of the Roman Catholic Church stands close SSE of Port Nolloth Light; and an oil tank is conspicuous near the L-shaped pier, about 0.4 mile, farther S.

A range of red sand hills, 183m high, rises 5 miles E of the port, and forms a background for the entrance range.

The Augrabis Mountains rise to an elevation of 493m about 14 miles inland.

Fairway Lighted Buoy is moored slightly N of the range line, about 100m inside The Bar. The channel leading to the L-shaped pier is marked by buoys. Two piers, about 61m long with shoal depths alongside, are conspicuous about 0.2 mile NE of South Point.

Pilotage.—Vessels unfamiliar with the port should not attempt to enter it without first contacting the Port Officer for instructions. No pilot is available, but the Port Officer will give directions for entering the harbor and for berthing on VHF channel 16. Entry and departure from the port are done only by day. Vessels should give an advance notice of 72 hours.

Regulations.—Port Nolloth is not a port of entry. Vessels arriving from non-South African ports must obtain permission from Cape Town or other South African ports.

Signals.—There is a signal station at Port Nolloth Light. Vessels can communicate by the International Code of Signals, by Morse code, and by VHF or radiotelephone.

The following signals are displayed by day:

1. A black and yellow basket at the dip indicates that the bar is dangerous.
2. A black and yellow basket close up indicates that the bar is impassable.
3. One black ball indicates that vessels must keep clear of an incoming vessel.
4. Two black balls indicate that vessels must keep clear of an outgoing vessel.

The following signals are displayed at night from the Bar Light:

1. A fixed white light indicates that the bar is passable.
2. A fixed red light indicates that the bar is impassable.
3. Both white and red fixed lights indicate that the bar is dangerous, but not impassable.

Anchorage.—The best anchorage outside the reefs, in 42m, sand, lies nearly 1 mile outside The Bar. The bottom is rocky E of this. This is a favorable position for communicating with the shore, but vessels at anchor here frequently roll heavily. Landing should not be attempted in ships' boats.

The inner anchorage lies between Robbe Islet and the town. Vessels may lie there in safety, for, although the sea may break heavily on the reefs and across the entrance, no heavy seas come far within them. There are depths of 2.1 to 3.7m in the anchorage. The best position is W of the pier, in about 3m. The lighter anchorage is farther S. The N end of the harbor is useless, as with a moderate SW swell the sea breaks over the N reef and onto the beach at high tide.

Directions.—The range line must be closely followed crossing The Bar. After reaching Fairway Lighted Buoy, course can gradually be altered to pass through the buoyed channel to the pier and inner anchorage.

Port Nolloth to Hondeklipbaai

5.38 **John Owen Bay** (29˚16'S., 16˚53'E.), E of Owen Island, is a small indentation open to the SW. Breakers extend across the entrance to the bay with a moderate swell from the S. The whole bay is a mass of broken water with a heavy swell. The bay should not be entered without local knowledge.

Caution.—Numerous mining vessels operate off the coast between Port Nolloth and Saldanha Bay. They moor with a spread of five anchors; unlit anchor buoys extend up to 1,500m from the vessels. The approximate positions of these vessels are broadcast daily over NAVTEX. These vessels, which should be given a wide berth, move constantly within their anchor spread.

5.39 MacDougalls Bay is a slight indentation 1 mile S of Port Nolloth. Reefs, with several rocks and islets, extend N and S of the entrance point.

Gooappunt (29˚17'S., 16˚53'E.) is 1.5 miles SSE of MacDougalls Bay.

Oubeepbaai (29˚20'S., 16˚54'E.), rockbound and providing no shelter, lies 1.5 miles SE of Gooappunt. A conspicuous sand hill, 25m high, lies close S of the bay.

Penguin Rocks (29˚36'S., 17˚01'E.), 2m high, lie about 0.5 mile offshore, about 18 miles SSE of Oubeep Cove. Rocks, which break with a heavy swell, extend about 1 mile W and 2 miles S of Penguin Rocks.

The coast S of the rocks is foul for nearly 1 mile offshore to the mouth of Buffelsrivier. Wolfberg rises to an elevation of 203m, with a large cairn of stones at its summit, 4 miles NE of

Penguin Rocks. Buffelskop, 3.5 miles E of Penguin Rocks, rises to 214m and has a trigonometrical beacon on its summit. Both hills are good landmarks. The headgear of a diamond mine, with its associated buildings, is conspicuous 3.5 miles SSE of Penguin Rocks.

The mouth of Buffelsrivier, with its 0.7 mile long sandy beach, lies 1 mile SSE of the mine headgear. A stranded wreck lies off the mouth of the river. The bed of the river is usually dry for a considerable distance inland.

The mining town of Kleinsee, 1 mile inland, on the S bank of the river, is prominent from seaward on bearings between 040˚ and 100˚. A sand cliff, 102m high, on the steep S side of an old mine dump is prominent when viewed from a bearing of less than 115˚.

The coast between the mouth of Buffelsrivier and Hondeklipbaai, about 40 miles SSE, is bordered by dangerous submerged rocks, some awash, extending up to 1.5 miles offshore. Gorab, 1.5 miles inland and 5.5 miles SSE of the mouth of Buffelsrivier, rises to an elevation of 189m, and has a beacon on its summit. It is the highest point of a flat range of hills.

5.40 Melkbospunt (29˚49'S., 17˚05'E.), 8 miles S of the mouth of Buffelsrivier, is low-lying and fringed with rock. Numerous white mining dumps lie close inland of the point. Swartklip, a rock, lies 6.5 miles SSE of Melkbospunt. It is a dark-colored rock, 2.5m high, lying close inshore off an inconspicuous rocky point.

Naganas Point (Naas Naaspunt) (29˚56'S., 17˚07'E.) can be recognized by a conspicuous rock near its extremity. A prominent wreck lies 0.8 mile SSE of Naganas Point. In 1977, a stranded wreck lay 6.7 miles SSE of Naganas Point. Another stranded wreck lies 2.5 miles farther SSE.

Swartkop, 287m high, 6 miles ESE of Naganas Point, is the highest of the coastal hills in the vicinity.

Caution.—The coast between Melkbospunt and **Skulpfonteinpunt** (30˚06'S., 17˚11'E.), 18 miles SSE, is fringed with dangerous submerged rocks. The area has not been closely examined and vessels are cautioned to stay at least 4 miles offshore. During fog or low visibility and at night this distance should be increased to 10 miles. A conspicuous ruin lies close to the point.

5.41 Somnaasbaai, 4 miles SSE of Skulpfonteinpunt, has a sandy beach where landing may be effected on a calm day. Wolfkop, 3.5 miles farther SSE, and 1.2 miles inland, is 74m high, and is a mine dump. A beacon is situated on its summit. The mining settlement of Koingnaas, 2 miles NE of Wolfkop, is conspicuous because of its white buildings which have bright green roofs.

Swartlintjiesrivier (30˚16'S., 17˚16'E.), 3 miles S of Koingnaas, is entirely barred by sand; rocks extend 0.5 mile from it.

Hondeklipbaai

5.42 Hondeklipbaai (30˚19'S., 17˚16'E.) receives its name from an isolated block of granite, 5m high, called Hondeklip or Dogstone. The stone lies 0.2 mile inland and 0.4 mile S of the head of the bay. The bay, suitable only for small vessels, is 0.3 mile wide, but its entrance is narrowed to 100m by rocks and foul ground extending from both entrance points. It is sheltered from all but W winds, which seldom occur. There is a beach in the S part of the head of the bay.

A jetty, with a large building at its extremity, extends NW from the S end of the beach. Hondeklip Bay Light is shown 0.2 mile N of the bay. A directional light is shown at the head of the bay, although it has been reported (1998) that the directional light is unreliable and should not be used to navigate into the bay.

Spitfire Reef, with a depth of 5.5m and on which heavy rollers occasionally break, lies 0.5 mile WSW of the S entrance point of the bay. Spitfire Rock, on which the sea breaks, lies 0.8 mile E of Spitfire Reef. These dangers should be given a wide berth.

The current off the coast in the vicinity of Hondeklipbaai usually runs N, but after a long continuation of N winds, it sets in the opposite direction.

The best anchorage outside the bay is in 10 to 15m, with Hondeklipbaai Light bearing 095˚, rock bottom, but good holding ground.

Hondeklipbaai to the Olifants River

5.43 Plaatklippunt (30˚20'S., 17˚17'E.), 1 mile S of Hondeklipbaai, has a stone cairn upon it. A stranded wreck lies on a rocky point 0.8 mile SSE of Plaatklippunt. The coast between Plaatklippunt and Rooiwalbaai, 8 miles SSE, is bordered by submerged rocks and breakers extending 0.5 mile offshore and possesses few features that can be distinguished at any distance, the hills being long ridges without definite summits.

Rooiwalbaai (30˚27'S., 17˚21'E.), 8.5 miles SSE of Plaatklippunt, has a vertical cliff of red sandstone, 11m high, at its head. The almost level summit of the cliff is surmounted by a sloping bank of white sand of about the same height. The red cliff with its white crest is easily identified when bearing about 065˚. The bay affords no shelter.

Extending for nearly 1 mile NW from the N point of Rooiwalbaai, is a reef of above-water and submerged rocks, terminating in a rock, 1.5m high, 0.3 mile from shore.

Spoegrivier, the mouth of which is closed, empties into a sandy bay, 1 mile wide, approximately 1 mile S of Rooiwalbaai. A group of rocks, which breaks, lies 0.5 mile off the S entrance point of the bay.

Spugmond (Kanoepkop), rising to 179m, 2.7 miles ENE of the river mouth, is the most prominent of the ill-defined coastal hills in the vicinity. It may be recognized by brown patches appearing on the N side.

The coast between the mouth of Spoegrivier and the Olifants River, 86 miles ESE, has few features that can be distinguished at a distance.

Caution.—Great care should be exercised along this coast due incomplete surveys of the area.

5.44 Strandfonteinpunt (30˚34'S., 17˚25'E.), 6 miles SSE of the mouth of Spoegrivier, has a submerged reef, on which the sea breaks heavily, extending about 0.7 mile WSW from it. Roodewal (Toringkop) rises to an elevation of 193m, about 2.5 miles ENE of the point. A conspicuous ruined signal tower stands on its summit, with a trigonometrical beacon close to it. Farther inland, a range of mountains, rising to elevations exceeding 1,500m, lies about 40 miles inland and parallel to the

coast, between Spoegrivier and the Olifants River. The Twins, rocks, which usually break, lie about 0.7 mile offshore, 15 miles SSE of Strandfonteinpunt. They should be given a wide berth.

Groenrivier (30˚50'S., 17˚35'E.) lies 4.5 miles SE of The Twins. The mouth of the river is usually closed by sandbanks. A conspicuous building stands 1 mile NNE of the river entrance. A light, at which a radiobeacon is situated, is shown 1 mile S of the river mouth. Island Point, 3 miles farther SSE, has a conspicuous wreck on it. A conspicuous boulder lies 1.2 miles N of Island Point. The mouth of the Brak River lies 13 miles SSE of Island Point. Ruitersvlei, a swampy area which is flooded at HWS, lies at the closed mouth of the river. Submerged rocks, which break, extend about 1 mile seaward from the coast in this vicinity.

Toringberg (31˚02'S., 18˚00'E.) rises to an elevation of 550m about 15 miles ENE of the entrance to the Brak River. When viewed from the vicinity of the river entrance, it has steep N and S sides. The mouth of the Sout River, which is closed, lies 10.5 miles SSE of the Brak River. A large rock, 4m high, lies 100m offshore, close N of the mouth of the Sout River. Krakeelklip, 350m high, lies 16 miles ESE of the river and is the best landmark in the vicinity.

5.45 Jakkalshok (31˚21'S., 17˚54'E.), 7 miles SSE of the mouth of the Sout River, may be recognized by the derelict mining machinery near the coast. Breakers have been observed extending seaward for some distance off Jakkalshok. Rocks extend 0.3 mile off a small unnamed point 6.2 miles farther SE, and two isolated drying rocks are charted 2.2 and 3 miles SE of Jakkalshok. Vessels are advised to stay well offshore.

Between Jakkalshok and Cliff Point, 18.5 miles SSE, several conspicuous buildings stand within 2 miles of the coast.

Cliff Point (31˚36'S., 18˚07'E.) is a remarkable double point of rugged formation, on which there are numerous mine workings and dumps. Graafwaterkop, a rounded hill, 130m high, 1.7 miles N of Cliff Point, has a beacon on its summit and is conspicuous.

Elephant Rock, 15m high, lies 3 miles SSE of Cliff Point, and 0.4 mile off the coast, to which it is almost connected by a reef of above-water rocks. A rocky reef extends about 0.1 mile from its W extremity.

The mouth of the **Olifants River** (31˚42'S., 18˚11'E.), 7 miles SSE of Cliff Point, is obstructed by a bar with a depth of 0.6m. The bar usually breaks. The town of Papendorp stands 1 mile E of the entrance, on the shore of a lagoon. A conspicuous school stands 1.5 miles NE of the river mouth.

From the Olifants River to Lambert's Bay between Jakkalshok and Cliff Point, 18.5 miles SSE, several conspicuous buildings stand within 2 miles of the coast. of Lambert's Bay

5.46 The coast between the Olifants River and Cape Deseada, 37 miles SSE, in contrast to the coast N of the Olifants River, has long and sandy stretches interspersed with rocky headlands. In general, the farther S one proceeds, the coast becomes greener and more cultivated, and the coastal and inland ranges of hills provide more distinctive landmarks.

Strandfontein (31˚45'S., 18˚14'E.), 4 miles SSE of the mouth of the Olifants River, is a holiday resort, and its white buildings are conspicuous when bearing ESE. A white hotel stands on high ground behind the village. A radio mast, with an elevation of 226m and marked by a red light, and another radio mast, with an elevation of 107m, and also marked by a red light, are situated 8 miles NE and 1.2 miles S, respectively, of Strandfontein. A light, at which a radiobeacon is situated, is shown from the S entrance point of Doringbaai, 3.5 miles S of Strandfontein. The bay is accessible to small fishing vessels with local knowledge. The coast between Strandfontein and the bay is generally rocky.

Cape Donkin (31˚56'S., 18˚16'E.), 7.5 miles S of Doringbaai, forms the S entrance point of Donkins Bay.

5.47 Lambert's Bay (32˚05'S., 18˚18'E.) (World Port Index No. 46740), 9 miles S of Cape Donkin, is 0.5 mile wide, with Bird Islet (Penguin Island), 12m high, lying off its SW point. The bay is backed by scrub-covered sand dunes, 6 to 20m high, one of which, Meidjies Sand Dune, is conspicuous 1 mile NE of Bird Islet. It is a fishing harbor and seaside resort; the town of Lambert's Bay stands in the SE part of the bay.

The bay is open NW, but is partially sheltered from SW winds by Bird Islet. The SW swell, though slight outside, frequently enters the bay, rounding the reefs extending from the islet and making the anchorage uncomfortable.

East Breakwater extends 0.2 mile NE of Bird Islet; a dredged channel leads from the vicinity of the head of this breakwater to Inner Harbor, which lies S of Bird Islet. West Breakwater and South Breakwater, which join Bird Islet to the mainland, form the W side of Inner Harbor. Random Mole extends 0.1 mile N from the mainland, on the E side of the dredged channel.

The limits of the port extend from a point on the shore about 0.5 mile NE of the directional light, then NW for 0.5 mile, then SW for 0.6 mile, and S to the shore.

Depths—Limitations.—The SE side of East Breakwater, near the outer end, is dredged to 5m for coasters. The dredged channel, leading to Inner Harbor, was dredged to 3m in 1975. The basin in Inner Harbor was also dredged to 3m and a wharf, 150m long, lies on the S side of the basin. It has been reported (1999) that there is less water than charted in the dredged channel and in Inner Harbor.

Fisherman's Ledge, with a least depth of 4.2m, lies 0.8 mile NNE of the NW end of Bird Islet, and extends 0.6 mile offshore. Die Mond se Blinder, a rock with a depth of 5.4m, lies 0.2 mile ENE of the head of East Breakwater. Ewartsklip, a rock, 4.2m high, lies 0.1 mile NW of Bird Islet. Koppies, a dangerous submerged rock, over which the sea breaks heavily, lies 0.1 mile N of Ewartsklip; a depth of 4.2m lies about 100m farther N.

Spence se Klip, a group of pinnacle rocks, has a least depth of 8.2m, about 0.5 mile NW of Bird Islet. Depths of less than 11m extend about 0.2 mile farther W, and depths of 12.1m lie 0.5 mile farther NW. Depths of less than 5m and dangerous rocks extend up to 0.3 mile SW of Bird Islet.

Aspect.—A light is shown from the head of East Breakwater. A directional light is shown 0.3 mile S of East Breakwater Light. Conspicuous chimneys stand 100m and 0.2 mile, respectively, SW of the directional light. The spire of a church is conspicuous 0.2 mile ESE of the same structure.

Anchorage.—Vessels with local knowledge and with drafts of up to 4m can anchor, in 11m, about 250m N of the head of

East Breakwater. This anchorage is well-sheltered from the prevailing SW swell, but vessels should be prepared to sail as the sea can become troublesome with little or no warning, filling the whole bay with breakers. Vessels at anchor in Lambert's Bay should proceed to sea immediately when the wind gets N of W.

Directions.—Vessels should approach from NW with East Breakwater Light bearing 130 .When about 0.3 mile off, alter course to 090 .

Lambert's Bay to Cape Deseada

5.48 Langvlei (32˚13'S., 18˚21'E.), a shallow lagoon and bird sanctuary, extends inland from the coast, 7 miles S of Lambert's Bay. A radio mast, 94m high and marked by a red light, stands at the W end of the lagoon.

Cape Deseada (32˚19'S., 18˚19'E.), 7 miles farther S, appears bold and cliffy from a distance of about 9 miles, as it rises steeply from the sea to the summit of a flat range of hills, 192m high. The cape ends in a low sandy point which is not easily seen from seaward. A radio mast, with an elevation of 160m and marked by a red light, stands close within the cape. A sandy patch is conspicuous immediately N of the cape. A 14.3m patch, which breaks occasionally, lies about 2 miles NNW of Cape Deseada.

Caution.—Due to the possible existence of uncharted rocks and shoals, vessels should exercise extreme caution when navigating within 6 miles of the coast.

Saint Helena Bay

5.49 Saint Helena Bay lies between Cape Deseada and **Stompneuspunt** (32˚42'S., 17˚59'E.), 29 miles SW. The entrance of **Great Berg** (32˚46'S., 18˚09'E.), at the head of the bay, consists of a cutting through the sand, protected by a breakwater on each side.

In the N part of Saint Helena Bay the shore is fairly steep-to, with a depth of 20m lying within 1 mile of the beach. In the SE part of the bay, depths of less than 20m extend 4 to 5 miles offshore, and the depths appear to be decreasing. The bottom of the bay is mostly sand and mud, but a great part of the SW side of the bay, from the mouth of Great Berg to a point 0.5 mile S of Stompneuspunt, is fringed with rocks, some of which lie about 0.5 mile offshore.

About 5 or 6 miles SSE of Cape Deseada, the country rises to abrupt crags and broken ridges of lofty hills, which extend 30 miles in the same direction and terminate in Piketberg, a range of mountains.

An isolated depth of 4.6m lies 4 miles N of the entrance to the Berg River. Varkvlei Farm, a cluster of white farm buildings, is conspicuous nearly 3 miles WSW of the entrance of Great Berg and help to identify Doctor Reef.

The entrance to Great Berg and the channel leading to the wharves at Laaiplek have been dredged to 3m, although lesser depths have been reported (1999). The tidal rise is 1.6m at MHWS.

Lights are exhibited at the head and inner end of each breakwater at the entrance of Great Berg. A racon is situated at the Inner East Breakwater Light.

The fishing town of Laaiplek, close within the river entrance, and the town of Velddrif, close E, are situated on the N bank of Great Berg. Several fish factories with their jetties lie along the SW shore of the bay. A conspicuous water tower stands in Laaiplek.

Port Owen, a yacht harbor, is situated on a tongue of land between Laaiplek and Velddrif, 1.5 miles within the harbor entrance. The port accommodates vessels having drafts of up to 2.2m.

Caution.—Shallower depths than charted have been reported (1993) 5 miles NE of the entrance to Great Berg.

5.50 Kleintafelberg (32˚33'S., 18˚28'E.), 16 miles SSE of Cape Deseada, rises to an elevation of 367m and appears to be much closer to the coast than it actually is. It is a conspicuous dark hill with a plateau, but its summit is rather uneven. Some of the mountains of the higher land behind are table-topped.

Kapteinskloof (32˚43'S., 18˚35'E.), 1,055m high, is a very conspicuous and well-defined summit of the Piketberg Range. This peak and range, from 10 miles offshore, appears as if situated close over the coast and must not be mistaken for the higher range farther inland.

The highest part of the range farther inland is bold, with its N face appearing precipitous. On a SW bearing, this part of Piketberg Range appears as two sharp peaks close to one another, with the E peak being the lower.

A water tower, with an elevation of 27m, is conspicuous at the village of **Dwarskersbos** (32˚42'S., 18˚14'E.), 12.5 miles E of Stompneuspunt. A radio mast, 98m high and marked by a red light, stands 5 miles NE of the village.

Caution.—An area of foul ground, 3 miles long, extends up to 1.2 miles off the coast close SW of Dwarskersbos.

5.51 Doctor Reef (32˚46'S., 18˚06'E.) extends about 2.5 miles offshore; at its extremity is a 1.5m patch that breaks at low tide and during rough weather.

Sandy Bay (32˚45'S., 18˚01'E.), 4.5 miles WNW of Doctor Reef, is the main harbor of the bay and is sheltered N by a breakwater extending E from Sandy Point. Considerable reclamation has taken place in the port. Two oil tanks are conspicuous 0.4 mile W of Sandy Point. A light is exhibited from the head of the breakwater at Sandy Point. A buoy marks a foul area near the breakwater head. A dangerous wreck lies within the harbor and is charted.

A berth, 74m long, with a depth of 6.1m alongside for coasters, lies on the S side of the breakwater extending W of Sandy Point. A pier, with an alongside depth of 4.5m at its head, extends 200m E of the coast 0.4 mile SSW of Sandy Point.

Drying reefs, with off-lying submerged rocks, extend 2 miles from Sandy Point to the S end of Stompneusbaai. Three small inlets penetrate the reefs, the NW of which is Jaloersbaai, lying 0.8 mile SSE of Sandy Point.

Simpson's Rock, which dries 0.5m, lies near the middle of Stompneusbaai. A cluster of above-water rocks, 7m high, lies 0.1 mile N of Simpson's Rock.

5.52 Stompneuspunt is the NE extremity of a sandy peninsula, which projects 1.5 miles from the coast and forms the W side of St. Helena Bay. Range lights lead into Stomp-

neusbaai. There is a conspicuous white tower at the head of the bay.

Vessels can anchor in convenient depths in St. Helena Bay. However, N winds in winter may cause a sudden increase in sea and swell.

North Blinder (Martin Rock) (32˚38'S., 17˚58'E.), a rocky ledge with a least depth of 5.8m, lies 4.5 miles N of Stompneuspunt. It rises from depths of 40m and breaks with a heavy swell.

A reef extends about 0.2 mile NE of Stompneuspunt; the wreck of a trawler, with a depth of 0.6m, lies 0.5 mile SE of the point. A rocky ledge, swept to a depth of 9.4m, lies 2.2 miles ESE of Stompneuspunt and 1.5 miles offshore. A rock, with a depth of 7.8m, lies 1.5 miles ESE of Stompneuspunt.

Saint Helena Bay to Saldanhabaai

5.53 Cape Saint Martin (32˚43'S., 17˚55'E.), a low, sandy point marked by a light, lies 3 miles WSW of Stompneuspunt. An isolated rock, visible at LW, lies 0.5 mile NNW of Cape Saint Martin. A current meter is moored 12.5 miles WNW of Cape Saint Martin.

Brittania Blinder, a steep-to reef with a least depth of 3.3m, lies 3 miles WNW of Cape Saint Martin. The sea breaks on it with a moderate swell.

Groot Paternosterpunt, 2 miles SW of Cape Saint Martin, has a reef and several islets extending about 1.5 miles WNW of it. Seal Island, 12m high and marked by a light, is the outermost islet. A light, at which a racon is situated, is shown from a mast on Seal Island. A dangerous submerged rock lies 1 mile S of Seal Island.

Klein Paternosterbaai, 4 miles S of Groot Paternosterpunt, is an important fishing station, and consists of a long sandy beach backed by sand dunes. The white houses of the village of Paternoster, on the S shore of the bay, are conspicuous. Rocks extend 0.5 mile NNW of the W entrance point of Klein Paternosterbaai. A dangerous rock lies about 0.3 mile ENE of the same point.

Tambourine Rock, 1.6m high, is conspicuous 3 miles S of Groot Paternoster, and 0.4 mile offshore.

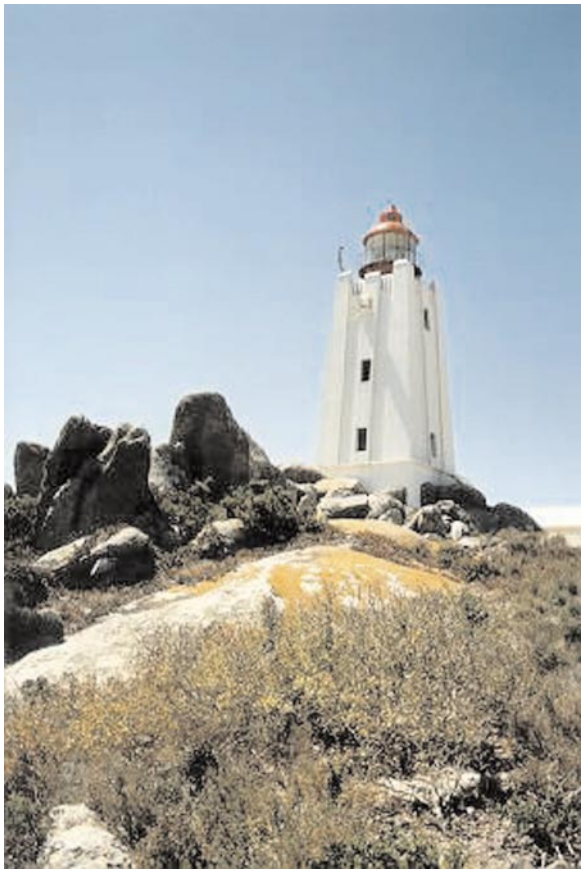
Kasteelberg, 3 miles E of Paternoster, rises to a conspicuous summit, 184m high.

Anchorage can be taken by vessels with local knowledge, in 9m, well-sheltered from the prevailing swell, with the factory situated close S of the W entrance point of Klein Paternosterbaai, bearing 222˚, distant 0.5 mile. This anchorage should not be used with wind or swell between N and W.

Jim Crow Rock, which dries 0.5m, lies 2.2 miles N of Cape Columbine, at the NW end of a rocky ledge on which the sea breaks in heavy weather. Vessels entering Paternosterbaai are advised to pass N of Jim Crow Rock as a dangerous 8m rock pinnacle lies between Jim Crow Rock and the mainland SE.

5.54 Cape Columbine (32˚50'S., 17˚51'E.), 6 miles SSW of Groot Paternosterpunt, is surmounted by Castle Rock, a conspicuous boulder. The cape is bordered by rocky reefs and an area of foul ground lies 1 mile NNW of the cape. A rock, with a depth of 1.8m, lies 1.5 miles SW of Cape Columbine.

A light is shown from a white, square, concrete tower, 15m high, on the cape; a radiobeacon is situated at the light.



Courtesy of Simon Baillie-Cooper
Cape Columbine Light

A conspicuous sand patch lies 2.5 miles SE of Cape Columbine. Cape Columbine is radar conspicuous.

Caution.—The coast between Cape Columbine and North Head, 14 mile S, is rugged and much indented, with numerous off-lying rocks, many of which rise almost perpendicularly from depths of 46m, making it one of the most dangerous on the coast of South Africa. The greatest care must therefore be exercised when navigating in this area. At night, or in thick weather, vessels should not attempt to navigate in depths of less than 100m, which will be found 4 to 5 miles off the coast. Depths of less than those charted have been reported up to 30 miles from the coast.

In 1976, a local magnetic anomaly, with deviations of up to 5˚E, was reported between 70 and 130 miles NW of Cape Columbine.

5.55 Duminypunt (32˚55'S., 17˚51'E.) lies 5 miles S of Cape Columbine, with exposed Noord-Wesbaai in between. A conspicuous water tower, 205m high, stands on the summit of a hill, 6.5 miles E of Duminypunt.

Two rocks, with depths of less than 1.8m, and Soldiers Reef, awash, lie 2 miles NW and 1.2 miles N, respectively of Duminypunt.

Voeleiland, the westernmost and larger of two islets, lies 1.5 miles NNE of Duminypunt, and 0.3 mile offshore. A reef, parts of which are awash and about 0.8 mile long, lies with its SW extremity 1.5 miles WSW of Duminypunt. A pinnacle rock, which seldom breaks and has a depth of 2.4m, lies 0.6 mile WSW of Duminypunt, and 0.2 mile E of the N end of the previously-described reef.

Wesbaai lies between Duminypunt and **Hospitalpunt** (32˚57'S., 17˚53'E.), 3 miles SE. A detached reef, awash, lies in the S part of the bay 1.2 miles NW of Hospitalpunt. There is a 10.3m patch 2 miles WNW of the point. A conspicuous sand patch lies 1.5 miles SE of Duminypunt.

Hospital Rock, 7m high, lies at the outer end of a reef which extends about 0.4 mile W of Hospitalpunt. Jacobs Reef, on which there is an islet, 3.2m high, extends 1 mile W of Hospitalpunt. Dangerous reefs, some awash at HW, lie within 0.7 mile N and 0.5 mile S of Jacobs Reef.

Temporary anchorage, in fair weather, can be taken, in 18m, about 0.8 mile S of Duminypunt.

The Sisters is a group of above-water rocks, extending 0.5 mile offshore, 2 miles SSW of Hospitalpunt.

Tooth Rock (33˚00'S., 17˚52'E.), 0.2m high, lies 1 mile farther SSW, nearly 1 mile WNW of Morrisons Point. A shoal patch, with a depth of 6.5m, lies 0.2 mile SW of Tooth Rock.

Caution.—Tooth Rock is the target point for a military missile and gunnery exercise range.

5.56 The entrance to Danger Bay, between Morrisons Point and Long Point, l.2 miles SSE, is reduced to a width of about 0.6 mile by rocks extending from both entrance points. The bay is open W and dangerous for strangers to approach.

Bay Rock, awash, lies 0.6 mile SW of Morrisons Point; Cap Rock, which dries, lies 1 mile W of Long Point. A rock, with a least depth of 2.4m, lies 0.5 mile WNW of Long Point.

Saldanha Bay (33˚02'S., 17˚58'E.)

World Port Index No. 46750

5.57 Saldanha Bay (Saldanhabaai) is entered between **North Head** (33˚03'S., 17˚55'E.), lying l.2 miles SE of Long Point, and South Head, 3.7 miles SSE. It is an ore-loading port, capable of accommodating deep-draft vessels. It is easy to access and is probably the safest harbor in southern Africa.

The town of Saldanha, in the NW part of Saldanha Bay, is a well known yachting center and holiday resort. Fishing is also an important industry.

Winds—Weather.—The climate is temperate. The average high temperature year round is 20˚C while the average low temperature is in the region of 11˚C. Sea water temperature averages 16˚C.

The prevailing winds are from SSW in the summer and the NNE in the winter. Rainfall figures are about 30cm per year. Saldanha Bay is a winter rainfall area.

Fog occurs generally in the March to August period.

Tides—Currents.—The tidal rise at Saldanha Bay may be as much as 2m. The tidal currents appear to set fairly in and out of the entrance to Saldanha Bay, at a velocity of 0.2 to 0.5 knot. At a short distance outside the bay, the current sets in a N direction at a velocity of 0.5 to l knot. Strong tidal currents set in and out of Langebaan Lagoon, with the outgoing current attaining a velocity of 3 knots at springs.

Depths—Limitations.—Langebaan Lagoon, the SE arm of Saldanha Bay, lies S of Skaapeiland (33˚05'S., 18˚01'E.) and extends 8 miles SE. It is encumbered by sandbanks near the entrance and has drying sandbanks and saltbeds near its head. Navigation is feasible only for shallow-draft vessels with local knowledge.

The harbor has been developed to accommodate vessels of 350,000 dwt, loaded, with a maximum draft of 21.5m. The dredged channel has swept depths of 23.2 to 23.7m.

An ore-loading jetty, 650m long, lengthened by an oil jetty 310m in length, lies at the outer end of a causeway which extends 1.7 miles SSW from the N side of Saldanha Bay. Berths alongside the ore and oil jetties are swept to 23m. Vessel draft is limited to 20.5m. Although there are berths on either side of the ore quay, only one vessel can be loaded at a time. The ore/oil jetty is approached through Navigation Channel, which is swept to a minimum depth of 23.2m. A turning circle, 0.3 mile in diameter and swept to a depth of 23.2m, lies at the seaward end of the ore/oil jetty.

Multipurpose Terminal, 250m long, is situated on the W side of the breakwater, about 0.5 mile SW of a conspicuous control tower. It is approached through a buoyed channel, with a maintained depth of 14.9m over a width of 150m. The quay has a depth of 12m alongside and can accommodate vessels with a maximum length of 200m and maximum draft of 11.5m. Ro-ro vessels can be berthed at the general cargo quay provided the vessel's length is less than 200m.

Off the quay there is a turning circle, 275m in diameter, that has been dredged to a depth of 14.9m. Severe surging can occur at this quay.

Maintenance Terminal, 110m long, and Rock Quay, 85m long, are situated on the W side of the root of the breakwater and have depths of 7.7m alongside. They are protected by a spur extending 0.2 mile WNW. A drying rock lies nearly 50m WSW of the head of the spur. The quays are approached by a channel, 130m wide, that is dredged to a depth of 7.7m.

Government Jetty, 0.7 mile NW of Hoedjiespunt, is a wood and concrete structure, 343m long, projecting NE into the bay, with depths of 6.5m alongside. A surge, particularly along the S side, often makes it impracticable for vessels to berth.

Sea Harvest Factory Quay, 540m long, with depths of 6m alongside, extends ESE from the root of the Government Jetty.

Aspect.—Hoedjiespunt (33˚02'S., 17˚58'E.), 3 miles ENE of North Head, lies at the extremity of a narrow rocky peninsula extending about 1 mile ESE from the W shore of Saldanha Bay. It is connected to Marcus Island, 1 mile SSE, by a breakwater. The ore-loading jetty lies at the outer end of a causeway which extends SSW from the reclaimed area in the NE part of Saldanha Bay.

North Head (33˚03'S., 17˚55'E.) is low and marked by a light. Schooner Rock, 7.5m high, is the outermost and highest of a group of above-water rocks extending about 0.2 mile SSW of the point. A rock, with a depth of 23.5m, lies 0.7 mile SSW of Schooner Rock.

Baviaansberg attains an elevation of 72m a distance of 0.5 mile N of North Head. Malgaskop rises to an elevation of 111m about 1 mile farther ENE, and has a large building near its summit.

Malgas Island, 7m high, lies 0.7 mile E of North Head and is surrounded by shoals and rocks extending up to 0.3 mile offshore. Needle Rock, 5m high and surrounded by above-water rocks and reefs, lies 0.2 mile NNE of Malgas Island.

Marcus Island, 9m high, lies 3 miles E of North Head. It is marked by a light equipped with a racon at its S extremity. There is a conspicuous black rock, 6.7m high, at the S tip of the island. Hospital Rock, 6.1m high, lies 100m S of the island.

Marcus Island is no longer an island, but is connected to Hoedjiespunt, nearly 1 mile N, by a breakwater which has a beach on its seaward side so constructed as to absorb the violence of the seas breaking upon it.

The conspicuous three-story Port Control Center building and a flagstaff are situated on the summit of the 37m hill located 2 miles NW of Hoedjiespunt. Another hill, 41m high, lies 0.9 mile farther NW.

South Head (33˚06'S., 17˚57'E.), the S entrance point of Saldanha Bay, is low, rocky, and marked by a light. It has a steep, cliffy summit, 113m high, close behind it.

There are shoals, with depths of 20m, 1 mile WSW and W of South Head. Jutten Island, 1.2 miles N of South Head, has a 34m high cone-like summit toward its S end, which is covered with guano and gleams white in the sunshine. Rocks extend about 0.2 mile N of the island, the N rock drying at very low spring tides.

Wasserfall Bank lies 0.8 mile NW of Jutten Island and has a least depth of 17.5m. About midway between the bank and Jutten Island is a shoal with a depth of 10.5m.

Lloyd Bank, with a least depth of 11.5m, extends 0.8 mile W of Jutten Island. During strong winds and heavy SW swells, the sea breaks over the two banks and the area between them and the island.

Elandspunt, 1 mile NE of Jutten Island and 1.2 miles S of Marcus Island, is rocky, comparatively steep-to, and marked by a light.

Vlaberg, 193m high, is conspicuous 2.7 miles E of South Head, on the W side of Langebaan Lagoon. Constable Hill, 189m high and 1.5 miles farther SE, is also conspicuous, and the factory building of an aluminum phosphate works is conspicuous on its N face.

Salamanderpunt, 1.2 miles ESE of Elandspunt, has the prominent buildings of a disused whaling station on it. A prohibited area, extending 0.3 mile offshore, surrounds the peninsula from the middle of Plankiesbaai, 1.5 miles SE of South Head, to a position 0.5 mile SW of Meeueisland. Juttenbaai, Stormbaai, Salamanderbaai, and Donkergatbaai are within the prohibited area.

Lynch Point, on the E shore of Saldanha Bay, 3.2 miles E of Marcus Island, is a rocky promontory surmounted by a scrub-covered sand hill, 40m high, with a trigonometric beacon on its summit. A yacht basin lies close SE of the point.

Lights, in range 056˚, lead between Malgas Island and Wasserfall Bank. The front light, which is only exhibited when vessels are expected, is situated 0.3 mile NE of Marcus Island Light; the rear light is shown from the head of the ore loading jetty. Lights, in range 080˚, close S of Lynch Point, lead through the entrance channel to Saldanha Bay.

The entrance to Navigation Channel, 0.7 mile SE of Marcus Island, which leads to the ore-loading jetty, is marked by lighted buoys.

North Lighted Buoy, North East Lighted Buoy, and East Lighted Buoy in Saldanha Bay indicate the position of the "safety line," to seaward of which ore carriers and tankers should keep when in light condition.

Lighted buoys mark the dredged approach channel leading to the general cargo quay on the W side of the causeway. The ore-loading jetty and causeway are lighted at night.

A stockpiling area lies at the root of the causeway; the control tower is conspicuous in the SW part of the stockpiling area. A conspicuous chimney stands N of the stockpiling area.

Lynch Blinder, a rock which uncovers during swells and over which the sea nearly always breaks, lies nearly 1 mile W of Lynch Point. It is marked by a lighted buoy. Inner Lynch, with a depth of 4.2m, lies 0.4 mile ENE of Lynch Blinder. Roman Bank, with a least depth of 7.6m, lies 1.5 miles NW of Lynch Point.

Hoedjieskop, 72m high, with a remarkable rock pillar and beacon on its summit, is conspicuous 1.2 miles NW of the Port Office. Seven Blinders, a small group of rocks with depths of less than 2m, lie 1.5 miles NNE of Hoedjiespunt. They are marked by a lighted buoy.

Pilotage.—Pilotage is compulsory, and vessels are warned not to cross the line joining North Head Light and South Head Light, known as the Arrival Line, without a pilot. The pilot boards 5 miles SW of North Head.

The pilots and the Port Office can be contacted by VHF and radiotelephone. Vessels calling at Saldanha Bay to load are required to send their ETA 4 days, 48 hours, and 24 hours prior to arrival. The 24-hour message should state the following:

1. Cargo required.
2. Arrival draft, fore and aft.
3. Deballasting time.
4. Other vessel details, as requested by the Port Captain.

Any changes to the ETA after the 24-hour message should be reported as soon as possible.

Vessels should contact Port Control on VHF channel 16 as soon as possible and request berthing instructions 6 hours prior to ETA.

Radio reporting stations are situated 11.5 miles NW and 14.5 miles SSW of North Head. Vessels requesting free pratique should cable Port Health, Cape Town via Cape Town Radio (ZSC) at least 24 hours before arrival.

Regulations.—A Vessel Traffic Service (VTS) is in operation to ensure the safe and efficient entry and exit for deep-draft ore vessels to the Port of Saldanha Bay. Radar and VHF radio stations are installed at the PORTNET Office and on Malgaskop (33˚02'S., 18˚56'E.) to improve navigation safety within the Port Control limits. The radars cover a radius of about 20 miles offshore. The VTS System is mandatory for the following vessels:

1. Vessels with an loa of 15m and over.
2. Towing vessels, where the length of the tow is 15m or greater, or the overall length of the tow is 30m or greater.
3. All passenger-carrying vessels.
4. All vessels carrying polluting or dangerous cargo.

The VTS Control Center is situated in the Port Office at Hoedjes Point (33˚01.7'S., 17˚57.8'E.). It operates 24 hours and can be contacted on VHF channel 12 using call sign "Saldanha Bay Port Control."

Vessels must contact Saldanha Bay Port Control on VHF channel 12, as follows:

1. Fifteen (15) minutes before arrival at the TSS.
2. Fifteen (15) minutes before departure from its berth.
3. At the designated Reporting Points (RP).

Further information on VTS reporting requirements can be found in Pub. 160, Sailing Directions (Planning Guide) South Atlantic Ocean and Indian Ocean.

The following information relating to vessels entering the harbor will be transmitted to the VTS Control Center:

1. Particulars of cargo on board.
2. Last and next port of call.
3. Draft, grt, loa, or any other information as required.

The VTS Control Center will provide the vessel with more accurate information of other vessel's positions and the density of traffic converging on the same positions.

The VTS System is linked to the Cape Town VTS Center, the Maritime Rescue Coordination Center, the Port Control Office, the Pilot Offices, and the local Coast Radio Station.

Signals.—Traffic control signal lights are displayed below the Port Control Building on Hoedjiespunt. A green light indicates that vessels are allowed to enter the port and a red light indicates prohibited entry. Signal lights have also been established at the head of the ore loading jetty. There are two similar banks, each having red and green lights. The bank facing seaward controls vessels entering the harbor, while the bank facing the shore controls vessels leaving the harbor: A green light indicates that the channel is clear and a red light indicates that passage through the channel is prohibited.

Anchorage.—Saldanha Bay opens out into an extensive basin, E of a line joining Marcus Island and Elandspunt, providing good and sheltered anchorage. The basin is divided into two parts by the causeway and ore-loading jetty. The NW part is Saldanha Bay Harbor.

Smitswinkelbaai is contained between the curved breakwater extending NE of Hoedjiespunt and Baviaanspunt, about 1 mile NW.

Good anchorage, in mud and sand, may be taken anywhere in Smitswinkelbaai, keeping clear of the sunken wreck 300m NW of the end of the curved breakwater and the prohibited area extending 250m from Government Jetty.

Saldanha Bay Vessel Traffic Service—Reporting Points (RP)

Inbound vessels		Outbound vessels		Inshore Traffic Zone	
RP	Position	RP	Position	RP	Position
Approaching from the S		Departing to the S		Inbound vessels from the N	
1B	33˚21.0'S, 17˚53.9'E	5	33˚03.3'S, 17˚58.3'E	1D	32˚53.7'S, 17˚45.9'E
2B	33˚10.6'S, 17˚49.3'E	4	33˚04.1'S, 17˚55.5'E	2D	32˚02.2'S, 17˚50.1'E
3	33˚06.7'S, 17˚50.1'E	3	33˚06.7'S, 17˚50.1'E	4	33˚04.1'S, 17˚55.5'E
4	33˚04.1'S, 17˚55.5'E	2B	33˚11.3'S, 17˚47.1'E	5	33˚03.3'S, 17˚58.3'E
5	33˚03.3'S, 17˚58.3'E	1B	33˚21.7'S, 17˚51.6'E		
Approaching from the N		Departing to the N		Outbound vessels to the N	
1A	32˚59.1'S, 17˚38.2'E	5	33˚03.3'S, 17˚58.3'E	5	33˚03.3'S, 17˚58.3'E
2A	33˚05.9'S, 17˚45.0'E	4	33˚04.1'S, 17˚55.5'E	4	33˚04.1'S, 17˚55.5'E
3	33˚06.7'S, 17˚50.1'E	3	33˚06.7'S, 17˚50.1'E	1D	32˚53.7'S, 17˚45.9'E
4	33˚04.1'S, 17˚55.5'E	2A	33˚04.6'S, 17˚46.8'E		
5	33˚03.3'S, 17˚58.3'E	1A	32˚57.8'S, 17˚58.3'E		
Approaching from the W		Departing to the W		Inbound vessels from the S	
1C(N)	33˚06.8'S, 17˚34.8'E	5	33˚03.3'S, 17˚58.3'E	1E	33˚20.8'S, 18˚01.8'E
1C(M)	33˚13.4'S, 17˚36.3'E	4	33˚04.1'S, 17˚55.5'E	2E	33˚09.1'S, 17˚54.3'E
1C(S)	33˚19.5'S, 17˚43.0'E	3	33˚06.7'S, 17˚50.1'E	4	33˚04.1'S, 17˚55.5'E
2C	33˚09.0'S, 17˚45.3'E	2C	33˚09.0'S, 17˚45.3'E	5	33˚03.3'S, 17˚58.3'E
3	33˚06.7'S, 17˚50.1'E			Outbound vessels to the S	
4	33˚04.1'S, 17˚55.5'E			5	33˚03.3'S, 17˚58.3'E
5	33˚03.3'S, 17˚58.3'E			4	33˚04.1'S, 17˚55.5'E
				1E	33˚20.8'S, 18˚01.8'E

The best anchorage in the SE part of Saldanha Bay is in 11m, about 1 mile ENE of Salamander Point. This is not as well sheltered as Saldanha Bay Harbor and is exposed to the frequent swells which set in, even during SW winds. During strong NW winds, the swell becomes very heavy and a nasty sea can be experienced when the ebb tidal current from Langebaan Lagoon is strong. On these occasions, vessels at anchor often lie broadside to the swell. Vessels should exercise caution when approaching the two mooring buoys anchored 0.5 mile ESE of Salamandar Point, as they are close to the limit of the prohibited area.

Directions.—In making the approach to Saldanha Bay, as in approaching all other places on the W coast of South Africa, the accuracy of the vessel's latitude is very important before approaching the land. In approaching Saldanha Bay at night, or in thick weather, care should be taken to avoid approaching the land N of the bay entrance due to the numerous rocks that lie off this coast.

After embarking the pilot, the vessel should enter the bay between Malgas Island and Jutten Island, passing N of Wasserfall Bank, following the previously-described entrance ranges.

Caution.—Submarines exercise frequently in the approaches to Saldanha Bay; a good lookout should be kept when passing through these waters. Extensive cray fishing is carried out in the approaches to Saldanha Bay. Numerous unlit buoys mark the nets and their mooring lines. Vessels are warned not to approach too closely to the coast at the entrance to Saldanha Bay. The foul ground off Malgas Island and Wasserfall Bank are unmarked hazards.

The harbor is occasionally subjected to severe swell conditions associated with weather depressions passing the Cape of Good Hope from W to E. Every depression does not produce a high swell. Conditions in the harbor are influenced by both the height and the direction of the swell outside. Surg-ing can be expected even in the innermost parts of the harbor. A wave monitoring buoy, moored alongside the entrance channel, gives a read-out in the port control building.

Saldanha Bay to Cape Town

5.58 The coast from Saldanha Bay to Cape Town and Table Bay, 50 miles SE, consists of sandy beaches lying between rocky headlands. Few of the bays so formed provide good shelter, with the exception of Table Bay itself, although this coastline is not so rugged as that to the N of Saldanha Bay. There are several off-lying rocks and shoals; a heavy surf generally makes landing difficult.

An eddy current sets S at a distance of 5 miles offshore between Saldanha Bay and Table Bay during the winter months of June, July, and August. At a short distance outside this eddy, the current is almost constant throughout the year. Its general direction is between N and NW, or parallel with the coast, and it attains a velocity of 0.5 to 1 knot, although between Table Bay and Dasseneiland it sometimes exceeds 2 knots. This current should be carefully taken into account, as it has a tendency to set vessels toward the coast, especially during or after strong onshore winds. Reports received from vessels approaching from N indicate that they have not experienced the usual N set when abreast the coast between Saldanha Bay and Table Bay, but a S set, sometimes away from and sometimes toward the coast, has been experienced.

5.59 Stony Head (33˚08'S., 17˚58'E.), 83m high and conspicuous, lies 2 miles SSE of South Head. A reef of rocks, over which the sea breaks heavily, extends 0.5 mile seaward of Stony Head.

Vondelingeiland, 7m high, lies 0.5 mile offshore, l mile SSE of Stony Head. The island is fringed by reefs; rocks extend 0.2 mile from its W end. A 10.9m patch, which breaks in bad weather, lies 0.5 mile WNW of the W end of the island.

Black Rock, 0.6m high, lies 1.7 miles ESE of Vondelingeiland, and is the outermost rock of a reef extending 0.2 mile offshore. A bulk carrier became stranded on this reef in 1978 and is conspicuous.

The coast from abreast Vondelingeiland to Ysterfonteinpunt, 14 miles SSE, consists of a sandy beach, backed by sand dunes rising to an elevation of 60m in places. These dunes, which are conspicuous, extend inland to a distance of over 1 mile. They are formed by drifting sand, and are extending E over the land.

Caution.—In 1985, a shoal was reported to lie 8 miles SSE of Vondelingeiland and about 5 miles offshore. Vessels are advised to give this position a berth of at least 2 miles.

5.60 Ysterfonteinpunt (33˚21'S., 18˚09'E.) has three distinct rocky ledges or points. The N point has a breakwater, 100m long, extending from it. Ysterfontein Hill, a flat conical hill, rises to an elevation of 84m about 1 mile E of the point and is marked by a beacon. A dangerous wreck, marked by a lighted buoy, lies in position 33˚40.3'S, 18˚19.9'E. Meeuwrots (Meeuw Rock), 10m high and whitened with guano, lies 0.3 mile N of Ysterfonteinpunt.

Swartberg, 286m high and surmounted by a beacon, with Betjieskop, 226m high, close by, stands 9 miles NNE of Ysterfonteinpunt, and is easily recognized. Ratelberg, 215m high, is located midway between Swartberg and Slangkop, which is 257m high.

5.61 Dasseneiland (33˚25'S., 18˚05'E.), 5 miles SW of Ysterfonteinpunt, rises to an elevation of 19m and consists of a fine grained, granite outcrop overlaid with sand which, in winter, supports luxuriant vegetation. Dangerous reefs, extending up to l.5 miles offshore, border its N, W, and S sides. A light is shown from a round metal tower, 24m high, and painted in red and white bands standing near the S end of the island. Dasseneiland is radar conspicuous.

Depths—Limitations.—House Bay lies between Boompunt (Boon Point), the NW extremity of the island, and the NE extremity, 0.7 mile E. Breakers and foul ground extend about 0.2 mile N of both points. A stranded wreck lies off the NE point. There is a flagstaff and jetty at the head of the bay. Depths of less than 5m extend up to about 0.2 mile N from the head of the jetty.

Anchorage.—Small vessels can anchor in House Bay, in a depth 18m, with the flagstaff bearing 173˚, and a conspicuous rock, about 0.2 mile SSE of Boompunt, bearing 247˚. The anchorage is not safe during NW winds. When NW winds prevail, good anchorage can be taken off Waterloo Bay, an indentation in the N part of the E side of the island, in 18 to 25m, sand and mud, about 0.5 mile offshore.

Caution.—West Ledge, 1.2 miles WSW of the light, is always above-water. The Triangles, a group of above-water rocks lying at the SE extremity of an extensive foul area, is located midway between West Ledge and the SW end of Dasseneiland. Roaring Sister, a group of rocks with depths of less than 2m, lies 1.3 miles SSE of the light. South Rock, with a depth of 10.8m, lies 0.2 mile farther S. Between West Ledge and South Rock, there are numerous shoals and several rocks with depths of less than 2m.

5.62 South West Breakers, two submerged rocks with least known depths of 9.7 and 10.9m, lie 3 miles SSW and S, respectively, of the SW end of Dasseneiland. Both rocks are steep-to. From the W rock, an irregular bottom in depths of less than 30m extends in the direction of Dasseneiland for about 1 mile. Bad weather causes a confused and dangerous sea in this area, which should be given a wide berth.

Protea Rock, with a depth of 10.9m, lies 5 miles SSW of Dasseneiland. A depth of 18.9m lies 1.7 miles farther S.

Great caution should be exercised in the vicinity of Dasseneiland, especially at night, as the reefs are steep-to and the positions of rocks are not always marked by breakers. With good visibility, no difficulty should be experienced when passing between Dasseneiland and Ysterfonteinpunt. However, in fog, poor visibility, or heavy weather, vessels should pass W of the island, in an area which would be an extension of the Saldanha Bay and Cape Town TSS.

5.63 The coast between Ysterfonteinpunt and the head of Table Bay is low and sandy, with occasional outcrops, backed by a series of distinctive hill summits. The silhouette of Devil's Peak, Table Mountain, Lion's Head, and Signal Hill, which are all described in paragraph 5.66, provides a remarkable composite backdrop to the harbor of Cape Town.

Rondeberg Breakers, a shoal with a depth of 8.2m and which is usually marked by breakers, lies 8 miles SE of Ysterfonteinpunt, and 2 miles offshore. It lies 4 miles SW of Rondeberg, a coastal hill, 189m high.

The mouth of the the Modder River, 11 miles SE of Ysterfonteinpunt, can be recognized by an extensive sand patch extending N of it. Black Rocks, two small islets, lie close S of the river mouth. A dangerous wreck lies about 2.8 miles NW of Black Rocks.

Bokpunt (33˚34'S., 18˚19'E.) is a low rocky projection lying 5 miles S of the mouth of the Modder River. A rock, with a depth of less than 1.8m and upon which the sea usually breaks, lies 0.5 mile W of the point.

An area containing unexploded ordnance lies 140 miles W of Bokpunt.

A range of mountains, roughly parallel to the coast and between 6 and 10 miles from it, extends 20 miles SE from **Slangkop** (33˚19'S., 18˚16'E.) to Kanonkop (Katzenberg), a well-defined, isolated, conical hill, 418m high, 12 miles E of Bokpunt. Kapokberg, 459m high; Contreberg, 479m high,;and Dassenberg, 567m high, are prominent peaks rising 10 miles NNE, 10.5 miles NE, and 11 miles ENE, respectively, of Bokpunt. Matroospunt, 4 miles SE of Bokpunt, is fringed by rocks and backed by a ridge, 43m high.

The low and sandy coast between Matroospunt and Melkbosch Point, 8 miles SSE, is backed by prominent sand dunes in its central part. Robbesteen, a small seal rookery composed of several rocky ledges up to 2.5m high, lies 0.4 mile offshore, in the N part of this coast.

A patch of submerged rocks lies 0.6 mile NNW of Robbesteen; submerged rocks extend nearly 1 mile SSE of Robbesteen Seal Ledge. Koeberg Nuclear Power Station has been established on a site 5 miles SSE of Matroospunt. A breakwater extends seaward for almost 0.5 mile and this, together with a shorter breakwater close N, encloses an intake basin designed to supply cooling water to the power station. It is not a harbor for vessels. Both breakwaters exhibit a flashing yellow light at their extremities. The entire complex provides a good radar target.

Caution.—There is a prohibited area extending approximately 1.7 miles seaward and 1.2 miles NW and SE of this basin. Within this area, 0.6 mile offshore, there is a patch of foul ground consisting of the remains of a demolished wave observation tower.

5.64 The buildings of the seaside village of Melkbosstrand, close E of Melkbosch Point, are conspicuous from NW. A radio tower, 61m high and marked by red obstruction lights, stands close NE of the village. A submarine cable extends W from Melkbosstrand for 80 miles and then turns in a NW direction. Anchoring or trawling is prohibited within 1 mile of either side of the cable.

Koeberg (Olifantskop), a conspicuous summit, 376m high, lies about 6.5 miles E of Melkbosch Point. Blouberg, a conspicuous dark, rounded hill, 231m high, lies 2 miles SSE of the same point. A large high-rise apartment building is conspicuous at Bloubergstrand, a seaside resort, 4 miles SSE of Melkbosch Point. Voelsteen is the seaward of three above-water rock clusters enclosing two shallow bays which front the village.

Submerged rocks and shoals extend about 0.5 mile NW of Voelsteen. There is heavy surf in the area, except in the calmest of weather.

5.65 Robben Island (33˚48'S., 18˚22'E.) 4 miles W of Bloubergstrand, is low, flat, and fringed by reefs. It is fairly densely wooded in parts along the E shore. In winter the more barren W part is covered in vegetation, and with wild flowers in the spring. Robben Island Light is shown from a white round tower, 18m high on the summit of Minto Hill. This is the highest part of the island and closest to its S end. Robben Island is radar conspicuous.

The bottom on the E side of Robben Island is rocky and uneven, and it is inadvisable for a vessel to anchor closer than 1.2 miles from the shore. There is a prohibited area 1 mile in circumfrence as indicated on the chart.

Ship Rock, about 1.3 miles SSE of Robben Island, has a depth of less than 2m, and the sea breaks over it in all but the calmest weather. The currents in the vicinity of this rock are sometimes strong and uncertain in direction. Dangerous submerged wrecks lie 0.9 mile NNW and 0.3 mile SE of Whale Rock; the latter wreck is marked close S by a lighted buoy.

Murray's Bay Harbor, on the NE side of the island is enclosed by breakwaters. The ferry quay, 244m long on the inner side of the S breakwater, has depths of 0.9m to 1.5m alongside. Elsewhere in the harbor there are depths of 1.6m to 4m. Lights, in range 297˚30', lead into the harbor. The white tower of the Anglican

Courtesy of Simon Baillie-Cooper

Robben Island Light (Minto Hill)

church 0.3 mile NE of Robben Island Light and a flagstaff between the church and Murray's Bay Harbor are conspicuous. Local knowledge is necessary to enter the harbor.

Cape Town (33˚55'S., 18˚25 'E.)

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5.66 Table Bay (33˚52'S., 18˚26'E.) is entered on the N side between Robben Island and **Bloubergstrand** (33˚48'S., 18˚28'E.), and from the W side between Robben Island and **Green Point** (33˚54'S., 18˚24'E.), the N extremity of the Cape Peninsula. A gently curving sandy coast backed by low sand dunes form the E side of the bay between Bloubergstrand and the industrial area of Paardeneiland, 7 miles S.

Cape Town Docks and the city of Cape Town lie along the SW shore of the bay.

There is a helicopter service available for tankers and other vessels not entering the harbor, however vessels wishing to use these services must comply with special instructions. This may be used for emergency medical cases, mail, and small items of stores. There is also a 24-hour launch service available to vessels outside the port limits. This service is restricted to vessels with a draft of less than 12.2m. Vessels requiring helicopter or supply launch service are required to keep clear of the approaches to the harbor (W of lines running in a NNW and SW direction as per the TSS on the chart, which indicates the E limit of the R/A (the nearest point is 6 miles WNW of Green Point). Vessels should not spend more than 1 hour in this area without anchoring. Arrangements should be made through the vessel's agent. .

Winds—Weather.—From October to April, the prevailing winds are from SE. From May to September, the prevailing winds are from NW. Low fogs occasionally occur in calm weather, particularly in the autumn and winter. High winds exceeding 60 knots and lasting several hours have occurred in the harbor during the summer.

The worst weather and heaviest swell are normally experienced after the wind has backed, and the swell usually continues for some time after the gale has blown itself out. The heaviest swell comes from the WSW or SW giving rise to the notorious "Cape Rollers" which, coming in on the beam, make

it uncomfortable for ships entering or leaving the port on either SE or NW courses.

Tides—Currents.—The tidal rise at Cape Town is 1.7m at springs and 1.2m at neaps. There is no apparent tidal current in Table Bay, but a summer current that sets N past Robben Island has been known to reach a velocity of 3 knots but usually is 0.5 knot or less. During the winter months when NW and W winds occur, a current sets into the bay from NW and impinges on the shore in the vicinity of Paardeneiland. Here it divides, one current setting N along the coast as far as Bloubergstrand, and the other W and NW past the entrance to the docks. It then turns SW along the shore to Green Point, attaining velocities of up to 2 knots.

Depths—Limitations.—In the vicinity of Green Point a sewer outfall extends almost 1 mile NNW.

Whale Rock and the shoals off Robben Island have been previously described in paragraph 5.65.

A 12.5m patch lies 2 miles WNW of **Milnerton Light** (33˚53'S., 18˚29'E.). A 13.1m shoal lies 0.2 mile S of the shoal.

An 11.2m rocky shoal lies 0.6 mile ENE of the head of Cape Town Breakwater and is marked W by a lighted buoy. The SE corner of Table Bay, off Paareneiland, has depths of less than 10m extending up to 0.7 mile off the shore.

The approach channel to Cape Town Docks extends in a SSE direction past the head of Cape Town Breakwater, then continues in a S direction. It is dredged continually to maintain the charted depths. Ben Schoeman Dock is entered from the S end of the approach channel and Duncan Dock, SW of Ben Schoeman Dock, is entered from the same channel.

Ben Schoeman Dock is entered between two small breakwaters. The entrance is 200m wide and the main part of the basin has been dredged to a depth of 14m. The inner face of the NE side of the basin, known as Main Quay, is divided into five berths. The outer three berths, each 305m long and having a depth of 13.6m alongside, are container berths. Southeast of the container berths are two bulk berths, with a total length of 456m and depths of 10.2 to 12.6m alongside. The SE side of the basin, known as Cross Quay, contains two container berths, with a total length of 366m and depths of 9.6 to 10.1m alongside. At the SW end of Cross Quay is a 201m long ro-ro pier, with a depth of 9.6m alongside.

Duncan Dock is located SW of Ben Schoeman Dock. It is approximately 1 mile long and 0.4 mile wide, and has over 2.5 miles of alongside berthing. The entrance to the dock, situated near the N end of the dock, is 180m wide. The maximum draft of vessels allowed to enter Duncan Dock is 12m. Such vessels may be accepted provided the tide level is 0.9m or more above chart datum.

There are 12 lettered berths and eight numbered berths. Berth A lies close NW of the dock entrance; the remaining lettered berths continue in a counterclockwise direction to Berth M. There are dredged depths of 9.1 of 12.6m alongside Berth A to Berth L.

Tanker Basin, in the E corner of Duncan Dock, has two tanker berths. Tankers, with a maximum length of 256m and maximum draft of 13.1m, are accepted at Berth No. 1 which, if so occupied, leaves room for a vessel of 204m in length at Berth No. 2. Tankers of up to 350,000 dwt, with a maximum draft of 10.7m, and in ballast, can be accepted for dry repairs, but they must be gas-free before entering harbor. Tankers are not berthed at night.

Alongside Eastern Mole, which has a total length of 518m and maximum depths of 12.7 to 13.7m alongside, Berth No. 1 and Berth No. 2 provide bunkering facilities for vessels of up to 350m in length and up to 130,000 tons displacement. Works were reported in progress in the vicinity of Eastern Mole in 1992.

Sturrock Graving Dock, on the SE side of Duncan Dock, is 360m long. The width at the entrance is 47.5m at MHWS; the distance below chart datum of the sill and the block is 15.1m.

Victoria Basin, NW of Duncan Dock, has about 2,500m of quayage, with depths of 3 to 10m alongside. The NW sides of Victoria Basin and Alfred Basin are being developed into a waterfront leisure area (1994). There is a shiplift at the SE end of Alfred Basin, for vessels of up to 1,750 dwt, 61m in length, 15m beam, and 6m draft.

Collier Jetty, in the S end of Victoria Basin, has depths of 6.4 to 9.8m alongside, and is used by vessels loading grain by conveyors from the tall storage basins of the conspicuous grain elevator SW.

During the winter months, considerable range action or scend may be experienced at Cape Town Docks.

Aspect.—The silhouette of Table Mountain, as viewed from N, is probably the best known panorama in South Africa. The N face, almost perpendicular and extending for a distance of 1.5 miles, is interrupted by Platteklip Gorge, a steep stony ravine separating Western Table from Eastern Table.

Maclear's Beacon (33˚58'S., 18˚26'E.), at an elevation of 1,085m, is situated on Eastern Table, and is the mountain's highest point. An aerial cableway stretches from a station at an elevation of 500m to the conspicuous Upper Cable Station on the NW edge of Western Table. A quick flashing green light is shown from the roof of the station, 1,045m high, when the cableway is operating at night during the summer months. On clear nights, this may be the first light to be distinguished from seaward.

The Twelve Apostles, a high, serrated mountainous ridge presenting a precipitous face to seaward, extends 4 miles SW from Upper Cable Station and forms the NW face of the Table Mountain complex.

Devil's Peak rises to an elevation of 1,001m about 2 miles E of Upper Cable Station and is connected to the main range by a saddle, 700 to 800m high.

Lion's Head, a steep, conical summit, 667m high, lies 1.5 miles NNW of Upper Cable Station. A ridge extends from Lion's Head in a NNE direction for 1.2 miles to the rounded Signal Hill (Lion's Rump), 350m high.

Devil's Peak, Table Mountain, Lion's Head, and Signal Hill provide a distinctive background to Cape Town Docks and the mushrooming high-rise buildings of the city of Cape Town. Table Mountain is radar conspicuous.

The Tygerberg (Tierberg) range of hills lies 5 miles inland and parallel to the E shore of Table Bay. Two groups of radio masts, each showing flashing red obstruction lights, are established on the highest summit, 414m high, and the S hill, 398m high. A radio microwave tower, 61m high and showing fixed red obstruction lights, is situated near the 455m summit of Kanonberg, 2 miles NE of the highest summit of the Tygerberg range.

Courtesy of Simon Baillie-Cooper

Green Point Light

Table View, with several large groups of apartment buildings, lies close to the coast, 1.5 miles SE of Bloubergstrand. Rietvlei, a marshy area, lies S of Table View, and flows into Milnerton Lagoon.

Milnerton Light (33˚53'S., 18˚29'E.) is shown from a white, round tower, 23m high, about 3.5 miles S of Table View. By day, on certain bearings, the light is often difficult to distinguish due to the high buildings behind it. Two radio masts, 30m high and marked by red obstruction lights, stand 1 mile ENE of the light.

The large complex of Groote Schuur Hospital, with its conspicuous white, gabled tower, is situated 1.5 miles SSE of Ben Schoeman Dock. Three tall circular apartment buildings are conspicuous 1.5 miles W of Groote Schuur Hospital and appear starkly outlined against the vegetation of the lower slopes of Devil's Peak. Because of the prevalence of industrial haze during days of calm or light winds, these buildings can often be seen clearly above the smog when the buildings of the lower-lying parts of the city are obscured.

Cape Town Dock complex extends 2.8 miles ESE from **Mouille Pointe** (33˚54'S., 18˚25'E.). The South African Merchant Navy Academy is situated on the point.

The approach channel leading to Cape Town Docks is marked by lighted buoys.

The Port Office, 63m high, is conspicuous at the seaward end of South Arm, the wall between Duncan Dock and Victoria Basin. A grain elevator is conspicuous near the inner end of South Arm. Two sets of range lights, in line 131˚30', at the SE end of Ben Schoeman Dock, lead into the dock.

Range lights mark the center of Duncan Dock.

Green Point (33˚54'S., 18˚24'E.), 0.7 mile W of Mouille Point, is marked by a light, shown from a square tower, 16m high, painted in red and white diagonal bands to make it stand out against the predominantly vertical and horizontal lines of the adjacent buildings. However in spite of this, it is often difficult to distinguish. The light is shown from a red dome.

Granger Bay, E of Mouille Point, has the conspicuous buildings of a hospital close S of its head.

Pilotage.—Pilotage is compulsory for merchant vessels when entering, leaving, or shifting berth in the docks area. Vessels should give advanced notice of their ETA to Port Control from a position 10 miles seaward of the breakwater light, using the call sign "Table Bay Port Control" on VHF channel 16 or 12. Pilotage is available 24 hours, except for oil tankers and other vessels carrying dangerous cargo, when it is available during daylight hours only.

Pilots should be requested 72 hours in advance and confirmed 1 hour in advance by contacting Port Control on VHF channel 16. The pilot boards 1.5 miles SW of the fairway lighted buoy.

Table Bay Harbor Control is situated in the control center on top of the Port Office. A radar scan of the port area operates in the control center.

Regulations.—A Vessel Traffic Service (VTS) is in operation to ensure the safe and efficient entry and exit to the Port of Cape Town. Radar and VHF radio stations are installed at the PORTNET Office and on Robbeneiland (33˚48'S., 18˚22'E.) to improve navigation safety within the Port Control limits. The radars cover a radius of about 20 miles offshore. The VTS System is mandatory for the following vessels:

1. Vessels with an loa of 15m and over.
2. Towing vessels, where the length of the tow is 15m or greater, or the overall length of the tow is 30m or greater.
3. All passenger-carrying vessels.
4. All vessels carrying polluting or dangerous cargo.

The VTS Control Center is situated in the Port Office (33˚54.3'S., 18˚25.9'E.). It operates 24 hours and can be contacted on VHF channel 14 using call sign "Cape Town Port Control."

Vessels must contact Cape Town Port Control on VHF channel 14, as follows:

1. Fifteen (15) minutes before arrival at the TSS.
2. Fifteen (15) minutes before departure from its berth.
3. At the designated Reporting Points (RP), which can best be seen on the chart.
4. Pilot boarding and berthing instructions will be given and vessels will be assigned to an anchorage, if necessary.

Further information on VTS reporting requirements can be found in Pub. 160, Sailing Directions (Planning Guide) South Atlantic Ocean and Indian Ocean.

The following information relating to vessels entering the harbor will be transmitted to the VTS Control Center:

1. Particulars of cargo on board.
2. Last and next port of call.
3. Draft, grt, loa, or any other information as required.

The VTS Control Center will provide the vessel with more accurate information of other vessel's positions and the density of traffic converging on the same positions.

The VTS System is linked to the Saldanha Bay VTS Center, the Maritime Rescue Coordination Center, the Port Control Office, the Pilot Offices, and the local Coast Radio Station.

Signals.—Port Control Traffic Signals are shown from the control center on top of the Port Office. A red light controls the Ben Schoeman Dock entrance, a green light controls the Duncan Dock entrance, and an amber light controls the Victoria Dock entrance. When a vessel is granted permission to enter any dock, a flashing light will be shown, and when a vessel is given permission to leave, a fixed light will be shown, in the appropriate color. These signals are shown day and night, and may be shown one at a time, or in combinations. No vessel is to enter the prohibited anchorage area when these signals are being exhibited without prior permission from harbor control.

A time signal, from the Cape Observatory, is fired daily at 1000 GMT from a gun battery on Signal Hill.

Anchorage.—Table Bay provides anchorage in convenient depths in the authorized anchorage areas and clear of the disused cable area extending from a point on the shore 0.7 mile N of Milnerton Light.

Anchorage should be avoided in an area of uneven ground and shoals, with depths of 6.7 to 10m, lying between 0.4 mile and nearly 1 mile offshore in the vicinity of Milnerton Light. The bottom is foul.

Vessels at anchor in the bay should at all times keep their main engines ready at short notice, and be prepared to put to sea on the approach of winter gales. For the rest of the year, and particularly during the months of December, January, and February, SE winds, which may reach gale force, are to be expected, and vessels are advised to anchor as far to the E as their drafts will comfortably allow.

Vessels are cautioned against anchoring or trawling in the disused explosives dumping area, W of Table Bay, where hulks and explosives exist.

Directions.—Vessels from the N, after passing W of Dasseneiland, previously described in paragraph 5.61, should shape their course to pass at least 4 miles within the southbound lane of the TSS for Table Bay, on a course of 140˚. When in the white sector of Milnerton Light, course should be altered to 090˚, remaining within the correct traffic lane to the pilot boarding position

Transiting from the N by day should provide no problems provided that Whale Rock and the shoals W of Robbeneiland are given a wide berth. The passage between Robbeneiland and Bloubergstrand is not recommended for large vessels.

Vessels approaching from the S should pass **Slangkoppunt** (34˚09'S., 18˚19'E.) at a distance of 3.5 miles on a course of 000˚. When Green Point Light bears 045˚, vessels shall enter the northbound traffic lane of the TSS for Table Bay. When Milnerton Light bears 090˚, alter course for the pilot boarding position.

Vessels approaching from the W should proceed to Table Bay, on a course with Milnerton Light bearing 095˚, cross the southbound lane of the TSS for Table Bay as close to a right angle as possible, and proceed to the pilot boarding position. Care should be taken against confusing Green Point Light and Milnerton Light when approaching from the W, as several near disasters, as well as a vessel's stranding, have been caused by this error.

Vessels should keep to seaward in depths exceeding 50m until **Sea Point** (33˚55'S., 18˚23'E.) is passed, then proceed with caution to the anchorage or pilot boarding area, passing N of the lighted buoy moored 1 mile NNW of Green Point.

Caution.—At night or in hazy weather, vessels approaching the port should always keep their depth sounding and radar sets running. For lack of these precautions, vessels have on occasion run ashore between Green and Mouille Points.

Fogs in this vicinity are often confined to the low ground when Green Point Light becomes obscured, while the elevated ground of Signal Hill and Lion's Head remains clear. In these circumstances, it is advisable to place a masthead lookout, who may see land when it is not visible from the bridge. Vessels underway in Table Bay should, as far as possible, keep clear of the prohibited anchorage area extending NNW of the head of Cape Town Breakwater. This area is required for vessels entering and leaving the docks. Such vessels may have to alter course in order to embark or disembark pilots. In addition, ships' navigation lights are often difficult to distinguish against the bright shore lighting.

During strong SE winds, care should be taken to avoid being set toward the breakwater while approaching the entrance to Victoria Basin. A useful visual reference to the centerline of the Victoria Basin entrance is a very steep road between two blocks of high-rise buildings.

Table Bay to the Cape of Good Hope

5.67 The Cape Peninsula extends from Green Point to the Cape of Good Hope, about 28 miles S. It is separated from the high ground to the N and E by a band of low-lying sandy ground, known as Cape Flats, which is 11 miles wide between the head of Table Bay and False Bay.

A series of mountain ranges extends from Table Mountain, past **Constantiaberg** (34˚03'S., 18˚23'E.), 928m high, and **Muizenberg** (34˚06'S., 18˚28'E.), 507m high, to Swartkop, 678m high, S of **Simonstown** (34˚12'S., 18˚26'E.). The series is broken by a low-lying valley extending ESE from Chapmans Bay to Vishoekbaai on the E coast of the peninsula. The valley is visible only on certain bearings. South of Swartkop, a series of lower peaks extends along the E coast as far as the Cape of Good Hope.

From W, the Cape Peninsula appears high and rugged from Table Mountain to within 4 miles of the Cape of Good Hope, where the mountain chain terminates in Paulsberg, 369m high and located close to the W shore of False Bay. From Paulsberg to Cape Point, the SE extremity of the Cape of Good Hope, the land is elevated, except for two peaks at its S end, which appear as a saddle-shaped island when seen from a considerable distance.

5.68 From Green Point to Bakoven, 4 miles SSW, the land between the mountains and the sea is densely built over.

Sea Point (33˚55'S., 18˚23'E.), 1.7 miles SW of Green Point, is a low, rocky promontory, with a beacon at its extremity. Sea Point Pavilion, a round tea room with a cupola, about 0.4 mile ENE of the point, provides a good landmark in contrast to the high apartment buildings in the background.

A rock, with a depth of less than 2m, lies 0.2 mile NE of Sea Point. A detached rocky patch, with a depth of 16.1m, lies 1 mile WNW of Sea Point. Saunders Rocks, extending seaward for 0.2 mile close S of Sea Point, have a depth of 3.5m at their extremity.

North Lion's Paw (North Paw), a rock drying 1.5m and steep-to except on its N side, lies 0.5 mile offshore, 0.8 mile SW of Sea Point.

South Lion's Paw, which dries 1m, and with a rock awash lying 0.2 mile W of it, lies 0.5 mile S of North Lion's Paw and about 0.3 mile off the point at the S end of Clifton Bay. Rocky foul ground, in which there is an islet, 10m high, extends from this point nearly to South Lion's Paw. Shoal ground extends about 0.4 mile W of South Lion's Paw. A rock, with a depth of less than 2m, lies in the center of this foul ground. The positions of North Lion's Paw and South Lion's Paw are normally indicated by swirls or breaking water, even at HW.

5.69 Camps Bay (33˚57'S., 18˚23'E.) is the next indentation S of Clifton Bay. Whale Rock, a large outcrop, 3m high, lies off the S entrance point of the bay. A depth of 11m lies 0.5 mile W of Whale Rock.

Bakovenbaai, close S of Camps Bay, marks what is virtually the S limit of the built-up area stretching from Green Point. Farther SSW the coastline rises comparatively steeply toward the Twelve Apostles. This vicinity is prone to forest fires in summer.

Rocky islets, along with above-water, drying, and submerged rocks, extend up to 0.5 mile offshore between Bakovenbaai and Hottentotshuisiebaai, a small rocky inlet, 2 miles SW. The remains of the wreck of a large tanker lie on the rocky coast close W of Oudekraal. Grootkop, 852m high, 1 mile SE of Oudekraal, is the highest peak of the Twelve Apostles.

Depths of less than 15m extend up to 0.8 mile off the coast between Hottentothuisiebaai and a narrow rocky promontory, a little over 1 mile SSW, which separates Logiesbaai from Llandudnobaai. A 6.3m rocky patch lies 0.5 mile off this coast. Logiesrots, which breaks in the calmest weather, lies about 250m W of the rocky promontory. A dangerous submerged wreck lies 0.5 mile SSW of Logiesrots.

Little Lions Head, 436m high, lies 0.5 mile SSE of Llandudno Bay and SW of the Twelve Apostles.

Oude Schip (34˚02'S., 18˚19'E.), 1.7 miles SW of Llandudnobaai, is a cluster of large boulders, almost surrounded by water, and surmounted by a beacon with an elevation of 16m. Foul ground, over which the sea nearly always breaks heavily, extends about 0.3 mile N and 0.5 mile W of Oude Schip. Die Middlemas, a rock 4.5m high, lies 0.2 mile W of Oude Schip. A dangerous wreck lies in the bay, 0.3 mile S of Oude Schip.

5.70 Duikerpunt (34˚02'S., 18˚18'E.), the W extremity of the Cape Peninsula, lies 0.7 mile SSW of Oude Schip. It is a bold headland, rising to the 653m summit of Karbonkelberg, 1 mile E. Foul ground, with several above-water rocks, extends 0.4 mile W and 0.5 mile S of the point. Duikerpunt is radar conspicuous.

There is a stranded wreck on the S side of the bay 0.2 mile N of Duikerpunt. A bank, with a depth of 128m, lies 43 miles W of Duikerpunt.

Vulcan Rock, which dries 0.9m and is always marked by breakers, lies 1.5 miles S of Duikerpunt. Tafelberg, a rocky patch, with a least depth of 7.6m over it and which breaks in heavy weather, lies 0.4 mile SE of Vulcan Rock. It is possible that shallower depths exist.

Hangberg (The Sentinel), a remarkable hill, rises to an elevation of 331m about 1.3 miles SSE of Karbonkelberg and appears to overhang when viewed from E. Badtamboer, the W entrance point of Houtbaai, lies close S of Hangberg. Duikereiland, a flat rock, 2.7m high, lies 0.5 mile W of Hangberg, and close off a small rocky projection of similar formation.

An area of foul rocky ground with much kelp surrounds Duikereiland, extending 0.4 mile SW of the coast in the vicinity. A line of breakers extends 0.3 mile SW from the island. A depth of 7.6m lies 0.6 mile WNW of the island.

Houtbaai

5.71 Houtbaai (34˚03'S., 18˚21'E.) is entered between Badtamboer and Die Josie, a rocky point 1.2 miles SE. The coast on each side of the entrance to the bay is high and rugged, particularly on the E side, where hills rise precipitously and are separated by ravines. The head of the bay is low and sandy. A wreck, with a depth of 13.2m, lies in the entrance to the bay, 0.4 mile ESE of Badtamboer. A shoal, with a depth of 15.2m, lies in position 34˚04'S, 18˚21'E.

Constantiaberg (34˚03'S., 18˚23'E.), 928m high, lies 2.2 miles E of Hangberg. A radio mast, 143m high, painted in red

and white bands, is conspicuous near the summit of Constantiaberg. It is marked by three red air obstruction lights, displayed vertically.

York Point, 0.5 mile NE of Badtamboer, is a low-lying point, fringed by boulders. Foul ground, consisting of above-water, drying, and submerged rocks, extends about 0.1 mile SE from a point close SSW of York Point.

A modern fishing harbor, sheltered by breakwaters, lies close N of York Point. Fishing factories, lighted at night, lie on the S side of the harbor. A wharf, extending NW from the inner side of the S breakwater, can accommodate trawlers up to 43m in length. Depths alongside are 4.5m on the N side and 5.4m on the S side.

Good sheltered anchorage may be obtained in Houtbaai, with excellent holding ground of soft sand. Anchorage in the harbor entrance should be avoided. Although the bay is open SW, strong winds, apart from occasional short-lived squalls, seldom occur from this quarter. When the Southeaster is blowing, squalls, variable in direction, sweep down from off the high ground, increasing after a few hours and setting up a very unpleasant short choppy sea. Under these conditions vessels at anchor should, if possible, enter the harbor where the surface of the sea is always unbroken, otherwise they should sail to sea, proceeding S to Chapmans Bay, where the wind will probably be less violent and will become more S in direction. Any anchorage in Chapmans Bay should be considered temporary because of poor holding ground.

5.72 Chapmans Point (34˚05'S., 18˚21'E.), 1 mile SSW of Die Josie, rises steeply E to Chapmans Peak, 593m high, and the S summit of the range extending from Constantiaberg. Another peak, 547m high, lies 0.3 mile NNE of Chapmans Peak. When viewed from the W, these two peaks present a dark appearance of apparently equal height.

Ratelklip, a reef lying 0.4 mile S of Chapmans Point, extends 0.2 mile seaward. The sea always breaks heavily over this reef and also over the foul ground extending 0.3 mile W of Chapmans Point.

Chapmans Bay, between Chapmans Point and Klein-Slangkoppunt, 2 miles SSW, provides no safe anchorage. The sandy beach at the head of the bay is backed by swampy ground in which there are lagoons and salt pans.

5.73 Slangkoppunt (34˚09'S., 18˚19'E.), 1.5 miles SW of Klein-Slangkoppunt, lies at the foot of the high ground which rises to the S of the low-lying valley extending from Chapmans Bay to Vishoekbaai. When seen from the N, the point appears as a long, flat plateau. Rocks and patches of kelp fringe the point, and foul ground between it and Klein-Slangkoppunt extends NW for about 1 mile.

Slangkoppunt Light (34˚05'S., 18˚21'E.) is shown from a white round tower, 33m high, which is conspicuous against the dark background of the hills behind it. The coast from Slangkoppunt to Cape Point, 15.5 miles SSE, is generally rocky, with numerous small indentations and sandy stretches backed at first by high mountain ranges, then by a series of smooth rounded hills, and finally by the steeper peaks at the Cape of Good Hope. Within depths of less than 50m, which extend up to 4 miles offshore, the bottom is generally uneven with a series of rocky shoals.

A wave-measurement buoy is moored 3.8 miles SSW of Slangoppunt. There is a restricted area around it, which is shown on the chart.

A wreck, with a depth of 12.8m, lies 1 mile W of the light.

The coast between Slangkoppunt and Die Eiland, 2.5 miles SE, is rocky and much encumbered with off-lying kelp. Die Eiland is a rocky, boulder-strewn point, upon which the brick buildings of a rock lobster factory stand near the water's edge. A radio mast, 85m high, stands on the point.

Sandkop, 0.5 mile NNW of Die Eiland, is 121m high, and conspicuous because of a sand patch near its extremity on its NW side. Another more extensive sand patch extends from the S side of the hill almost to the rocky shore. A range of hills runs parallel to the bight in the coast between Die Eiland and Schuster's Bay, 2 miles SE. Platkop, 371m high, and Platberg, 308m high, are prominent summits in the range. Rocky shoals lie within depths of 30m in this vicinity.

A least depth of 13.4m lies a little over 1 mile W of Die Eiland; a depth of 18.2m lies about 1.5 miles W of Schuster's Bay. Vessels are advised to keep in depths of over 50m when passing these shoals and also off Hoek van Bobbejaan, farther S.

The Cape of Good Hope Nature Reserve, at the S tip of the Cape Peninsula, has a coastline extending from Schuster's Bay, rounding Cape Point, to Smitswinkelbaai on the E coast of the peninsula. Bonteberg, 227m high, 1 mile SSE of Schuster's Bay, is the highest hill in the NW part of the reserve, and is conspicuous from SW by virtue of the bluff slope on its W side.

The low-lying valley of Kromrivier lies S of Bonteberg. The river flows into a long narrow lagoon, separated from the sea by a low and sandy strip. Submerged rocks, encumbered with kelp, extend about 0.5 mile seaward of the sandy strip and off the coast as far as Olifantspunt, 2 miles S. Depths of less than 15m extend 1 mile seaward of the S end of the sandy strip, enclosing a least depth of 11m about 0.8 mile offshore.

Olifantsbospunt (Olifantbos Point) (34˚16'S., 18˚23'E.), a rocky promontory, may be readily identified by a wreck, in three parts, which can be seen against the sandy beach inshore of the rocks, although the guano covering the wreck makes it appear to be a rock until studied closely.

Albatrosrots (Albatross Rocks), a group of submerged rocks over which the sea occasionally breaks, lies 0.6 mile WSW of Olifantsbospunt.

5.74 Hoek van Bobbejaan (34˚19'S., 18˚24'E.), another rocky headland, lies 2.5 miles SSE of Olifantspunt. Foul ground extends 0.2 mile seaward from the point. An extensive rocky bank, with depths of less than 30m extends about 3.5 miles WNW from Hoek van Bobbejaan, then 2 miles S to a position W of the headland, and then in an ESE direction towards South West Reefs. There are several shoals with depths of 15m or less toward the W edge of the bank, the least depth being 13m, nearly 3 miles W of Hoek van Bobbejaan. In bad weather, during S gales, the sea breaks heavily over these shoals, and a confused sea extends from them to the coast. Vessels passing these shoals are advised to keep in depths exceeding 50m.

The coast between Hoek van Bobbejaan and Cape Maclear, 4.5 miles SE, is generally rocky, with off-lying submerged

rocks. The Groot Blouberg range of hills runs parallel to this section of the coastline, its highest summit being Kommetjieberg, 116m high, about 0.7 mile SE of Hoek van Bobbejaan. Between this range and the peaks at the extremity of the Cape of Good Hope, the height of the ground is less than 100m.

Platboom Bay lies between Platboom Point, 2.5 miles SE of Hoek van Bobbejaan, and Pegrams Point, 1 mile further ESE. The Island, a reef of drying rocks, lies 0.2 mile W of Platboom Point.

The Cape of Good Hope

5.75 The Cape of Good Hope, at the S extremity of the Cape Peninsula, resembles a ballet dancer's foot, with **Cape Point** (34˚21'S., 18˚30'E.), the pointed toe, stretching E, and the rounded Cape Maclear, about 1.2 miles W, as the heel.

There are two peaks on the Cape of Good Hope. Vasco de Gama Peak, 262m high, lies 1.2 miles WNW of Cape Point. The SE peak, 243m high, lies 0.4 mile WNW of the same point.

Cape of Good Hope Light is shown from the extremity of Cape Point, at an elevation of 87m from a square masonry tower, 9m high. A fixed red light is shown from the base of the light structure at an elevation of 77m. A radiobeacon is situated at the old light, best seen on the chart, and a continuous watch is kept at the signal station situated there. Two radio masts, 31m high, are situated in the vicinity.

An extensive rocky bank, with depths of less than 30m, lies off the Cape of Good Hope, and extends 2 miles W and SW of Cape Maclear, and about 2 miles S and l.5 miles SE of Cape Point. Except during the calmest weather, the sea breaks over the entire area. South West Reefs are patches on a rocky ledge extending about 1 mile SW of Maclear Point. The least depth of 4.8m lies 0.6 mile off the point. The sea generally breaks over these reefs.

Bellows Rock, which dries 1m, lies 2 miles SSW of Cape Point. The sea always breaks over it, and its position can easily be seen in fine weather. Vessels may pass a distance of 0.5 mile S of it. However, on moonless nights, during foul weather, and in poor visibility, vessels should keep well clear. Anvil Rock, with a depth of 3.9m, lies 1.2 miles SE of Cape Point. Close W of it there is a rocky bank, with a least depth of 8.2m. The sea does not break over Anvil Rock unless there is a heavy swell running, when it will probably do so at LW.

Dias Rock, 2.5m high, lies 0.1 mile SSE of Cape Point, at the seaward end of a submerged reef. Three patches with pinnacle rocks, with depths of 9.7, 10, and 13.4m, lie between Dias Rock and Anvil Rock. These patches, together with the generally irregular nature of the bottom, render passage between the above rocks hazardous for deep-draft vessels, but small vessels with local knowledge may use it with advantage, provided the weather is good.

Rocky Bank, an extensive shoal area, lies between 4.5 and 6.5 miles SE of Cape Point. It has a least depth of 21.5m, about 6 miles SE of the point.

Directions.—Laden tankers should not approach the coast within a distance of 25 miles. See Pub. 160, Sailing Directions (Planning Guide) South Atlantic Ocean and Indian Ocean for further information.

In clear weather, a vessel approaching the Cape of Good Hope from NW by day should keep well seaward of the shoal water off Hoek van Bobbejaan and South West Reefs. After passing these shoal areas, alter course to pass not less than 0.5 mile S of Bellows Rock. An E course should then be maintained, keeping in depths of more than 50m, until Constantiaberg radio tower (34˚03'S., 18˚23'E.), bearing between 337˚ and 339˚, is well open E of Swartkop (34˚13'S., 18˚27'E.). The vessel will then be clear of Anvil Rock and course may be altered N. When Vasco de Gama Peak, bearing 299˚, is open N of Cape of Good Hope Light, Anvil Rock will have been passed abeam. At night a vessel should keep in depths of more than 50m while in the red sector of Cape of Good Hope Light.

In clear weather, a vessel approaching from W by night, should sight Cape of Good Hope Light at a distance of not less than 23 miles, provided it is not obscured by land on a bearing of 106˚ or more, in which case Slangkoppunt Light should be seen at a distance of not less than 17 miles. On approaching land by day or night, proceed as described in the previous paragraph.

In thick weather, by day or night, if the land or lights are not sighted, a vessel should not approach the coast, but should keep in depths of more than 100m until such time as the vessel's position has been ascertained. If necessary, a vessel should pass E of Rocky Bank.

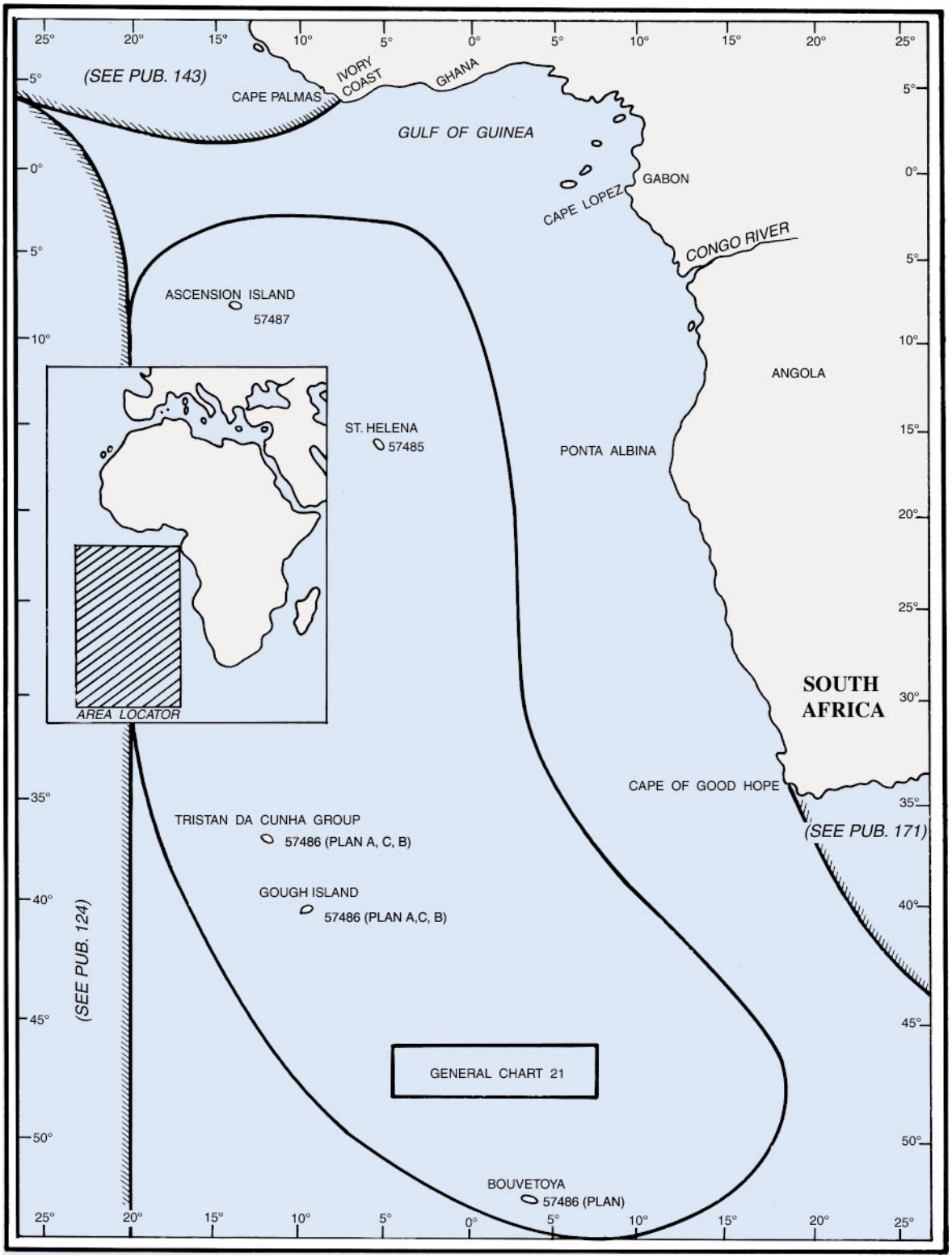
A vessel approaching land should, in addition to obtaining soundings, make full use of its radar and electronic navigation systems.

Caution.—Submarines exercise frequently off the S coast of South Africa and in the approaches to False Bay, N of 36˚S and between 16˚ and 20˚E.

During the season, from November 1 until June 30, intensive cray fishing takes place in the area up to 4 miles offshore between Slangkoppunt and Cape Point, and occasionally over Rocky Bank, 6 miles SE of Cape Point. Trap buoys are brightly colored, and the fishing area is marked by buoys with white flashing lights. Vessels are strongly advised to keep 5 miles off the coast in this area and clear of Rocky Bank.

Explosives dumping grounds are centered 15 and 45 miles SSW of the Cape of Good Hope. Each dumping ground is a circular area with a radius of 5 miles. The N of these areas is no longer used.

Explosives have been dumped in an area, with a radius of 1 mile, lying centered 6.2 miles SSW of Cape Point Light.



Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.

SECTOR **6** — CHART INFORMATION

SECTOR 6

ISLANDS AND SEAMOUNTS IN THE SOUTH ATLANTIC OCEAN

Plan.—This sector describes Ascension Island, Saint Helena Island, the Tristan da Cunha Group, Gough Island, and Bouvetoya. This sector also describes certain seamounts in the E part of the South Atlantic Ocean. The descriptive sequence is from N to S.

Ascension Island

6.1 Ascension Island (7˚57'S., 14˚22'W.) is an important communications cable station. Georgetown, in the NW part of the island, is the only settlement and port on Ascension Island and is the center of administration. The surface of the island is extremely irregular and presents a rugged and uninviting appearance when viewed from seaward. It rises to its greatest elevation of 859m at **The Peak** (7˚57'S., 14˚21'W.), the summit of Green Mountain.

The latter mountain takes its name from the color of its top, and it is surrounded by numerous other craggy peaks of less elevation, with deep gorges and dark ravines between. There are about 40 cones of various magnitudes on the island, being extinct craters, from many of which the courses of the lava streams may be traced to the sea. Rain falls more frequently on the summit of Green Mountain than on the lower parts of the island. Mist generally obscures the mountain for some part of the 24 hours. The only signs of vegetation on the island are on Green Mountain, where vegetables are successfully cultivated. Water is obtained from the cement rain catchments on the mountain and is conveyed through pipes to covered tanks in Georgetown.

6.2 Devils Riding School (7˚58'S., 14˚23'W.), a crater more rugged and remarkable than the rest, lies 2.5 miles WSW of Green Mountain.

Tides—Currents.—The predominant set is W at 0.5 knot. Rollers take the form of either SW or NW rollers, and may be expected about once every two weeks, and are strong enough to prevent lighters from lying alongside the wharf. Rollers can be up to 3m in height. Locally, the smaller ones are called single rollers and the larger ones double rollers. When single rollers are running, landing may still be effected, but difficulty is often experienced in getting alongside the steps, and great caution should be exercised. The origin of these rollers is attributed to the swell produced by intense storms thousands of miles away in the North Atlantic Ocean and the South Atlantic Ocean.

The depths offshore on the E side of Clarence Bay are sufficient to prevent the swell acquiring the character of breaking rollers, except in cases where the undulation arrives from NW and breaks directly upon the island. The waves are very low and of such great length that they are not noticeable in deep water, but on reaching shallow water they become shorter and higher. Off Clarence Bay, they frequently break on crossing depths of 9m. Rollers from either direction may occur during any month of the year, though the frequency of NW rollers is greater during the months of N winter, and of SW rollers during the S winter.

The shoals NW of the wharf appear to subdue the NW rollers and they arrive at the wharf in the form of an ordinary swell. It then becomes quite possible to use the landing place, and lighters can be taken in and unloaded as long as the swell is not very heavy.

A combination of NW and SW rollers seldom occurs, although this combination raises a nasty lumpy sea extremely dangerous to boats. On these occasions, a pyramidal mass of water, 3.7 to 4.6m high, may rise in the direct track of boats steering for the wharf from the roadstead and break about 50m NW of Tartar Rock. Neither SW nor NW rollers break in the vicinity of the anchorage, nor in the vicinity of the mooring buoys for lighters. Rollers cross these areas in the form of a swell, the effect of which diminishes as the distance offshore is increased. The swell at the anchorage is not nearly so heavy as that at the mooring buoys for lighters, and lighters can always be used by vessels lying at the anchorage, although at the same time communication with the shore may be impossible.

Caution.—An unnamed seamount, with a reported depth of 152m, lies in position 3˚02'S, 0˚45'E, about 960 miles ENE of Ascension Island.

Ascension Island—West Coast

6.3 North Point (7˚53'S., 14˚23'W.), the N extremity of Ascension Island, has foul ground and a wreck lying 250m N of it, and it should be given a wide berth. A depth of 5.1m lies about 0.2 mile NNE of North Point. An islet, with a cairn, 11m high, lies close N of the point. Two beacons, in range 090˚ and 100m apart, stand on North Point. Three gray oil tanks stand 0.6 mile WSW of North Point. Beacons, in line bearing 180˚, stand 0.1 mile WNW of the oil tanks. A depth of 2.7m lies 0.3 mile NW of the oil tanks.

Three mooring buoys lie close offshore, about 0.1 mile NNE of the oil tanks. English Bay, close W of North Point, is encumbered by shoals. A radio mast, marked by red obstruction lights, stands near the head of the bay. Nine radio masts stand S of the E edge of the bay.

An offshore tanker berth lies off English Bay and can accommodate tankers of up to 12.2m draft and 183m in length. Special arrangements to berth tankers here are made through the Queen's Harbormaster, Ascension Island.

A headland, about 0.7 mile W of North Point, should be given a berth of at least 0.2 mile, as a shoal ridge, with a depth of 6.5m, extends 0.1 mile to seaward off the headland.

Vessels approach on a course of 090˚ with the beacons on North Point in line. The port anchor is let go 0.5 mile W of the front leading beacon (when crossing the 180˚ transit); the starboard anchor is let go when 0.3 mile W of the front leading beacon. The vessel then turns to port and secures its stern to hooks on the shore close N of the oil tanks. Two black and white poles, in line bearing 090˚ and 40m apart, stand 300m S

of the 090˚ leading beacon above. They mark the final position of the stern of the tanker when it is secured.

Clarence Bay lies between Pyramid Point, 2 miles SW of North Point, and Catherine Point, 1.7 miles farther SW

6.4 Georgetown (7˚56'S., 14˚25'W.) (World Port Index No. 46670) , the only port and settlement on Ascension Island, lies in the S part of Clarence Bay, between Catherine Point and Fort Thornton, 0.7 mile NE

Depths—Limitations.—An extensive area of shoal and foul ground, with depths varying between 0.3 and 10m, extends 0.6 mile NW from the coast between Catherine Point and Fort Thornton. The bottom is rocky and uneven. A black and white spar buoy is moored NW of the extensive foul ground, 0.7 mile NW of Catherine Point; it was reported (1986) that this buoy lies about 300m SW of its charted position.

Tartar Rock, 2m high, lies about 150m NW of Fort Thornton, and five rocks, between 0.5 and 2m high, lie 50m offshore, N of Fort Thornton. A black and white spar buoy is moored NE of the shoals of Georgetown, about 0.2 mile NW of Tartar Rock. The buoy marks the NE edge of the 10m curve surrounding the foul ground between Fort Thornton and Catherine Point. A floating hose leads from this buoy SE to the shore. There are mooring buoys for the use of the island launches and lighters close W of the 10m curve. Landing is effected at a wharf, 23m long, with a depth of 3m alongside, situated close W of Fort Thornton.

Aspect.—Pyramid Point is 9m high. Pyramid Rock, 15m high, stands on the point. This rock is a useful mark for approaching the anchorage, but as it does not appear on the skyline until bearing about 023˚, it is difficult to distinguish. The rock is a brown peaked rock near the water's edge and contrasts in color to the coast in the vicinity.

Lights, in range 050˚, are shown about 0.2 mile E of Pyramid Point. The range is difficult to see during the day due to numerous masts in the vicinity.

Bates Point, formed of lava rock, lies 0.6 mile SSW of Pyramid Point. Bates Rock, above-water and marked by a white square beacon, 2.5m high, lies close off Bates Point.

Catherine Point (7˚56'S., 14˚25'W.) is low. White fuel tanks are conspicuous 0.2 mile SE of the point. A light is shown from a white column, with a red diagonal stripe, nearly 0.3 mile ENE of Catherine Point when vessels are in the vicinity. A group of radio masts stands N and S of this light.

Fort Hayes stands on Hayes Hill, 32m high, 0.4 mile NE of Catherine Point. Fort Thornton stands on a hill, 23m high, 0.2 mile farther NE. Several radio masts stand SW and E of Fort Thornton.

Redpole Monument, a white, square pyramidal obelisk, 4.6m high, with its apex 23m high, is conspicuous 0.3 mile ESE of Fort Thornton. Lights, in range 140˚, are shown in the vicinity of Redpole Monument when vessels are approaching the bay.

Cross Hill, one of many rounded hills on Ascension Island, overlooks the settlement of Georgetown, and is surmounted by a conspicuous tower. A mast, close NW of the tower, stands at an elevation of 283m and is marked by a red light.

Regulations.—There is a port radio station at Georgetown. Vessels should send their ETA 48 hours in advance, via Ascension Island (ZBI), Saint Helena (ZHH), Cape Town (ZSC) or other coast radio station. The port authority may be contacted on VHF channels 16 and 12.

Anchorage.—Vessels of 75,000 tons have used the anchorage in Clarence Bay. Lighters are used for unloading at the anchorage. One rescue launch is available. No tugs are available.

The best anchorage is in 20m, with the lights near Redpole Monument in range 140˚ and the lights near Pyramid Point in range 050˚. From this position, the light 0.3 mile ENE of Catherine Point should bear about 180˚ and the beacon on Bates Rock about 082˚. Some old moorings foul the bottom between the anchorage and the position of the mooring buoys for lighters.

Vessels should anchor with a good scope of chain, as the wind is sometimes strong off the high land. Vessels usually lie to a single anchor heading toward the land, but instances have occurred when they have swung the stern toward the shore.

Since vessels roll almost continuously at this anchorage, it is necessary to keep this possibility in mind when a berth is selected.

Anchorage S of the outer buoy, which marks the shoals off Georgetown, is unsafe, and rollers sometimes prevent landing in that vicinity for several days in succession.

Directions.—Vessels approaching from N should give the coast a berth of at least 0.5 mile.

Anchorage should be taken when the previously-described range lights are in line.

Vessels from S or W should avoid the shoals off Georgetown by keeping seaward of the outer buoy, and by keeping Pyramid Rock bearing not less than 055˚, nor should the N end of The Long Beach of Clarence Bay be brought to bear less than 085˚. The latter bearing just clears the shoals off Georgetown.

Caution.—There is a disused cable area in the N part of Clarence Bay, the limits of which are shown on the chart.

Catherine Point should not be used for fixing the vessel's position as it consists of detached rocks with no definite extremity.

6.5 Payne Point (7˚57'S., 14˚25'W.) lies 1.1 miles S of Catherine Point. A mast, 154m high, stands almost 0.6 mile NE of Payne Point and shows red obstruction lights. Red obstruction lights are shown from a mast 0.2 mile NNE of Cat Hill and from a mast on South West Bay Red Hill, which are located 0.3 mile and 1 mile E, respectively, of Payne Point. A conspicuous sphere and a dish aerial stand on Cat Hill. A radiobeacon is situated approximately 0.5 mile E of Payne Point. A pumping station lies 0.2 mile SE of Payne Point. A group of buildings lies close E of the pumping station.

South West Bay is entered between McArthur Point, 0.7 mile SSE of Payne Point, and Portland Point, nearly 1 mile farther S. Shoal water extends about 0.2 mile W of McArthur Point. The bay has a fine sandy beach, backed by a steep lava cliff, the highest point of which rises to an elevation of 75m.

A smooth plain lies 0.5 mile inland of the head of the bay. A depth of 4.9m lies about 0.3 mile S of McArthur Point.

Meteorological rocket firings take place from a position 0.7 mile NNE of Portland Point. Lights are shown from the point when the range is in use.

South Point (8˚00'S., 14˚24'W.), the S extremity of Ascension Island, has several rocks or islets close off it. An islet, with

a rock, awash, close E of it, lies about 275m off-shore, 0.5 mile W of South Point.

Saddle Crater, 129m high, 1 mile E of Portland Point, has several conical hills in its vicinity. A conspicuous mast, 30m high, stands on the 228m high summit of South Gannet Hill, 0.5 mile E of Saddle Crater. Dish aerials stand on Saddle Crater and South Gannet Hill.

Wideawake Airstrip is situated N of Saddle Crater and South Gannet Hill.

Caution.—Anchorage is prohibited, due to the existence of submarine cables in South West Bay, within an area shown on the chart, extending about 1.5 miles W from the entrance points of the bay.

Ascension Island—Northeast Coast

6.6 **Porpoise Point** (7˚54'S., 14˚21'W.) lies 1.5 miles ESE of North Point and Northeast Point lies 1.2 miles farther SE. Northeast Bay lies W of a point 0.3 mile W of Northeast Point. Foul ground extends about 100m off the E entrance point of the bay. It is reported that rollers only enter the bay about six times during the year.

Anchorage, fairly sheltered from the predominating SE wind, may be obtained in Northeast Bay.

The coast between Hummock Point, 0.5 mile SE of North East Point, and South East Head, 2.7 miles farther SE, is high, rugged, and inaccessible, with deep water close off it. Boatswain Bird Islet, 104m high, lies 2 miles SE of North East Head. Boatswain Bird Rocks, with depths of less than 1m, lie 0.2 mile offshore, about 0.3 mile SE of Boatswain Bird Islet.

South East Head (7˚57'S., 14˚18'W.), the E extremity of Ascension Island, rises to an elevation of 145m. White Hill, 525m high, lies 1.3 miles W of South East Head.

Caution.—A firing practice area extends about 2.5 miles NE from the NE shore of Ascension Island, from a position on shore about 0.6 mile ESE of North Point to a position on shore about 0.4 mile W of North East Point. Although no restrictions are placed on the right to transit the firing practice area at any time, vessels should exercise caution when in the area. Red flags are shown when the area is in use. The area is operated using the clear range procedure; exercises and firing only take place when the area is considered to be clear of all shipping.

Ascension Island—South Coast

6.7 The coast between South East Head and South Point, the S extremity of the island, 6.5 miles WSW, continues high, rugged and inaccessible. This coast is exposed to the full force of the SE tradewinds, and the sea breaks upon it with great violence. Mountain Red Hill rises to an elevation of 547m about 1 mile inland and 2.6 miles NW of South Point.

Ascension Island—Offshore Seamounts

6.8 **Grattan Seamount** (9˚45'S., 12˚45'W.), with a depth of 70m, lies 140 miles SE of Ascension Island. A depth of 213m lies 40 miles E of Grattan Seamount.

Cardno Seamount (12˚53'S., 6˚08'W.), with a depth of 77m, lies 180 miles N of Saint Helena Island. A seamount, with a depth of 115m, lies 90 miles NNE of Cardno Seamount. A depth of 152m lies 720 miles NE of Cardno Seamount.

Bonaparte Seamount (15˚45'S., 6˚52'W.), with a depth of 105m, lies 70 miles WNW of Saint Helena Island.

Dampier Seamount (11˚09'S., 0˚28'W.), with a depth of 594m, lies 430 miles NE of Saint Helena Island.

Kutuzov Seamount, with a depth of 410m, lies 155 miles WNW of Saint Helena Island.

An unnamed seamount, with a depth of 515m, lies midway between Cardno Seamount and Kutuzov Seamount.

Saint Helena Island

6.9 **Saint Helena Island** (15˚58'S., 5˚42'W.) lies 703 miles SE of Ascension Island. The island, at a distance of about 60 miles, resembles a huge pyramidal-shaped fortress rising abruptly from the sea. No signs of vegetation are visible until a near approach is made, when it can be seen in the valleys and on the summits of hills, in striking contrast to the precipitous and almost inaccessible cliffs which form the coastline. These cliffs, 300 to 550m high, are divided by chasms, through which streams flow from the high lands of the interior and terminate in small coves partially exposed to the sea.

Landing is impracticable except on the NW or leeward side of the island. In favorable weather, landing may be effected in Prosperous Bay and Sandy Bay, on the E and S sides, respectively, of the island.

Saint Helena Island is divided into two unequal parts by a ridge of mountains, 600 to 818m high, extending in a curve from Castle Rock Point, the S extremity of the island, to **Stone Top Point** (15˚59'S., 5˚39'W.). The principal peaks of the ridge are **Mount Actaeon** (15˚58'S., 5˚42'W.), 818m high, with Diana Peak, 794m high, close SE, and High Peak, 797m high, about 2 miles WSW of Mount Actaeon.

6.10 **Flagstaff Hill** (15˚55'S., 5˚41'W.) rises to an elevation of 693m near the N end of the island. Towering fragments of basalt are located on each side of the SW part of the above range. Two of the most remarkable are located on the S side of the range and are named **Lot** (15˚59'S., 5˚43'W.) and Lot's Wife, about 1.5 miles SW. They are formed of strangely-contorted columnar basalt, and are 60 and 49m high, respectively, while their summits stand at elevations of 454 and 462m.

The most singular phenomenon connected with this part of the ocean is the setting in of very heavy continuous swells or rollers from NNW. They are most prevalent during the months of January and February, when the waves break on the NW coast of Saint Helena Island with astonishing grandeur. Landing in a boat is dangerous when rollers are setting in, and only shore boats should be used. These rollers rise without any apparent cause for, as a rule, the weather is good and the wind light. If a vessel is moored in a depth of 31m there is no danger, as the rollers only commence to be dangerous within 200m of the shore.

Local reports indicate that December to March is the time when rollers are most frequent. Ruperts Bay is reported to be more affected than James Bay. Up to 3 day's warning of rollers from the NW may be passed from Ascension Island by radio, which is relayed to ships over VHF by Saint Helena Radio.

Saint Helena Island—Northwest Coast

6.11 Sugarloaf Point (15˚54'S., 5˚42'W.) is the N extremity of Saint Helena Island. Sugarloaf Hill rises to an elevation of 272m, about 0.3 mile WSW of Sugar Loaf Point. Buttermilk Point lies 0.2 mile WNW of Sugarloaf Hill and is marked by a light. Banks Point lies 0.2 mile SSW of Buttermilk Point.

6.12 Jamestown (15˚55'S., 5˚43'W.) (World Port Index No. 46690), the port for Saint Helena Island, is entered between Munden Point, a little over 1 mile SW of Buttermilk Point, and Ladder Hill Point, 0.4 mile farther SW. Ruperts Bay is entered 0.5 mile NE of Munden Point. Loading and discharging of cargo is by lighters

James Bay and Ruperts Bay afford the only landing places on Saint Helena Island, where landing can be effected at practically all times. Landing in boats can usually be effected at the wharf in Saint James Bay, but the swell becomes heavy at times. During periods of heavy swell, it is better to lie off the landing place and make use of the shore boats.

Deep valleys descend between steep rocky hills to the heads of the two bays. The two valleys are separated by a ridge rising from Munden Point to a height of 283m. James Valley, descending to James Bay, in which is the settlement of Jamestown, is bordered on its SW side by a ridge which descends from High Knoll. The summit of the ridge is located 1 mile S of James Bay. The ridge extends to Ladder Hill, where it terminates abruptly in a stupendous perpendicular cliff facing the sea. Ruperts Valley is bordered on its NE side by Ruperts Hill, 411m high.

Winds—Weather.—The SE wind is prevalent in James Valley and Rupert Valley, but where there is high ground the prevailing wind is deflected so that a light NE wind blows along the NW side of the island. The interaction of this wind and the main SE wind causes a confused sea in the vicinity of Ruperts Bay and Sugarloaf Point.

Tides—Currents.—The tidal rise at Saint Helena Island is 0.9m at MHWS and 0.7m at MHWN. The tidal current in James Bay is reported to set N during the rising tide and SW during the falling tide, although a vessel reported (1984) experiencing no tidal currents while at anchor.

Depths—Limitations.—There is a concrete wharf, 91m long, on the NE side of James Bay, with a depth of 3m alongside.

Two mooring buoys, used by tankers while discharging to the shore by a floating hose, lie within Ruperts Bay about 275m NE of Chubbs Point.

To assist in berthing, two beacons are positioned about 0.5 mile E of Munden Point and, in line bearing 091˚, lead to the two mooring buoys.

A number of lighter and small craft moorings lie in James Bay.

A wreck, with a depth of 17.8m, is marked close NE by a buoy, and another wreck close NW, lie about 0.4 mile NNW of Ladder Hill Point. A foul area, in which ammunition has been dumped, lies about 0.1 mile farther NE.

Dangerous wrecks lie in James Bay, about 150 and 250m, respectively, NNE of Ladder Hill Point. Fish havens lie 0.2 mile N of Munden Point and 0.4 mile W of Ladder Hill Point; anchoring and fishing are prohibited in these areas.

Aspect.—An old artillery barracks stands on the summit of Ladder Hill. Range lights, shown from white triangular beacons, stand on Ladder Hill and lead to No. 2 Anchorage. Although these beacons are clearly visible by day, their vertical difference in height reduces their transit accuracy. Only the lower beacon is easily identified; the upper beacon can be found close E of the flagstaff on Ladder Hill.

Chubbs Point Light (15˚55'S., 5˚43'W.) is shown from a mast on the NW side of a building, 300m ENE of Munden Point.

The tower of Saint James Church is conspicuous at the head of James Bay. A white monument is conspicuous on the shore about 120m NW of the church. A white triangular beacon, 2m high, stands on the W extremity of Sampson's Battery, 0.7 mile SSE of Munden Point.

A white cottage, about 0.2 mile ESE of Munden Point, is conspicuous from W or NW, but is obscured by trees on certain bearings from N.

Pilotage.—An experienced pilot is available for taking vessels to the anchorages.

Regulations.—No boat, except the Health Officer's boat, is permitted to go alongside any incoming vessel which intends to anchor, nor is any contact with other vessels or with the shore permitted until pratique has been granted. Any vessel placed in quarantine shall continue to show a yellow flag and by night shall exhibit, from the foremast, two white lights in a vertical line, at a distance apart of not less than 1.2m or more than 1.8m. Vessels calling at Saint Helena Island for refuge to land a sick person, or for other reasons, are advised to anchor.

Port officials, including medical staff, will not board unless the vessel is at anchor. However, if a vessel is unable to anchor, it should heave-to 1 mile NNW of Ladder Hill Point.

If anyone is to be landed, a ship's boat must be used. The Saint Helena Island port launch will meet the boat in the mooring area, about 275m N of Ladder Hill Point. During the operation, radiotelephone contact should be maintained with Saint Helena Island coast radio station. If a vessel is likely to arrive outside the normal operating times of the radio station a request should be made in advance to maintain communication until the operation is completed.

Vessels should send an ETA 24 hours in advance through Saint Helena (ZHH). Vessels intending to use the anchorage should contact Port Control or Saint Helena on VHF channel 16 for assistance.

Anchorage.—Anchorage may be taken as convenient off James Bay, but in depths of not less than 31m due to the rollers. The bottom in the roadstead is coarse sand, gravel, and silt. A large vessel intending to remain for any length of time should anchor N or NW of Ladder Hill Point.

No. 1 Anchorage, the best sheltered, is in a depth of 33m, NW of Ladder Hill Point, with Saint James Church tower, bearing 120˚, in range with the beacon on Sampson's Battery, and with Sugarloaf Hill bearing 058˚30', or Munden Point bearing 073˚, in range with the SW entrance point of Ruperts Bay.

No. 2 Anchorage, used by vessels of up to about 20,000 tons, is the most convenient, being close to the range line, nearer the wharf, and also well sheltered. The berth is in a depth of 37m, good holding ground, with Saint James Church tower bearing 152˚, and with the summit of Sugar Loaf Hill in range with the

S edge of the battlements at Banks Point bearing 058˚30'. Most vessels use No. 2 Anchorage.

A smaller vessel can anchor in No. 3 Anchorage, a little closer inshore, in a depth of 35m, with Saint James Church tower bearing 142˚, and the N end of the wharf bearing about 093˚ in range with the conspicuous white cottage on Munden Hill. Numerous boat and lighter moorings may prevent the use of No. 3 Anchorage, as the swinging circle may be foul.

All three anchorages are clear of the previously-described wrecks. Anchorage may be obtained off Ruperts Bay, but vessels are cautioned that abandoned submarine cables exist E of a line drawn 335˚ from Munden Point.

Directions.—From NE, after clearing Sugarloaf Point and Buttermilk Point, which may be passed at a distance of about 0.1 mile, steer WSW to bring the entrance range in line for the appropriate anchorage. From SW, steer to keep a prudent distance off the NW coast of the island, then use the entrance range for No. 2 Anchorage as a guide.

Caution.—A local magnetic anomaly, causing variations of up to 7˚ greater than charted, was reported (1972) in the vicinity of Munden Point.

6.13 James Bay to West Point.—Anchorage may be obtained, in 27 to 51m, about 0.3 mile offshore, anywhere off the coast between Ladder Hill Point and Lemon Valley Bay, 1.5 miles SW.

Long Ledge, a narrow reef, extends 0.2 mile NW from the coast, 0.5 mile SW of the W entrance point of Lemon Valley Bay. The Lion, an isolated above-water rock, lies about 275m offshore, 0.2 mile SW of Long Ledge.

Lighter Rock lies 275m offshore, 1 mile SW of Long Ledge. Egg Island, 88m high, lies 1 mile SSW of Lighter Rock. Peaked Island and Thompson's Valley Island lie 0.2 mile and 0.8 mile, respectively, SW of Egg Island.

Anchorage can be taken in 37m, about 0.2 mile NW of Egg Island.

West Point (16˚00'S., 5˚47'W.) is the W extremity of Saint Helena Island.

Saint Helena Island—North and East Coasts

6.14 Flagstaff Bay, between Sugarloaf Point, the N extremity of Saint Helena Island, and a point 2 miles E, has not been thoroughly examined. The indications are that it is fairly steep-to and is clear of known dangers.

The remains of a vast crater can be traced between **Flagstaff Hill** (15˚55'S., 5˚41'W.) and The Barn, a mountain 618m high, at the NE end of the island. Barn Ledge, a small detached rocky shoal with a least depth of 5.9m, lies 0.8 mile offshore, 1 mile SE of Barn Long Point, the NE extremity of Saint Helena Island. Depths of 16.5 to 22m lie within 0.1 mile of Barn Ledge, which is generally marked by a heavy ground swell. Sugarloaf Point, bearing less than 279˚ and open N of the N part of the coast under The Barn, leads N of Barn Ledge.

Prosperous Bay is entered between Black Point, 1 mile SSE of Barn Long Point, and Bay Point, 0.8 mile farther SE. Anchorage can be taken in Prosperous Bay, in 22m, about 0.2 mile offshore.

King and Queen Point (15˚57'S., 5˚38'W.), the E extremity of the island, also known as Saddle Point, lies 0.7 mile SE of Bay Point. The intervening coast is steep-to. Gill Point lies nearly 1.5 miles S of King and Queen Point. George Islet, a detached rock, lies 0.5 mile SSE of Gill Point, the SE extremity of Saint Helena Island. George Islet bearing more than 178˚, and well open E of King and Queen Point, leads E of Barn Ledge.

Saint Helena Island—South Coast

6.15 Saint Helena Island—South coast.—Shore Islet (15˚58'S., 5˚38'W.) lies 0.2 mile SSE of Gill Point. Rough Rock, a point on this precipitous part of the coast, lies 1.5 miles SW of Gill Point. Rough Rock Islet and Flat Rock lie 0.1 mile E and 0.4 mile WSW, respectively, of Rough Rock. Two rocks, known as The Buoys, lie 0.2 mile SE of Powell Point, 2 miles SW of Rough Rock.

Sandy Bay is entered N of Horse's Head, 1.3 miles W of Powell Point. There is a landing place on the SW shore of the bay, and an old battery is situated on its N shore. Along the S coast of the island, W of Sandy Bay, a horizontal stratum of columnar basalt stretches for a considerable distance, forming a stupendous wall 15 to 55m high. The Chimney, a remarkable hexagonal column of basalt, 20m high, is an isolated portion of this wall, lying close offshore, 0.8 mile WSW of Sandy Bay.

6.16 Castle Rock Point (16˚01'S., 5˚45'W.), 165m high, lies 2.2 miles SW of Horse's Head. The intervening coast is precipi-tous and apparently steep-to, though it has not been thoroughly examined.

There are a number of off-lying rocks up to 100m offshore, including The Chimney, Lot's Wife Ponds, and White Bird Islet. Robert Rock, an islet, lies 0.2 mile S of Castle Rock Point, with two small rocks lying close N and S of it.

The Jar and Flat Rock lie about 0.1 mile SE and SW, respectively, of Castle Rock Point. Speery Islet lies 0.5 mile SW of Castle Rock Point. Flat Rock and Salt Rock lie 0.1 mile NE and E, respectively, of Speery Islet.

A depth of 23.7m, position approximate, lies 0.5 mile ESE of Castle Rock Point. Speery Ledge, an isolated reef with a depth of 2.7m, lies 1.2 miles S of Speery Islet.

Lower Black Rock, 43m high, and Upper Black Rock, 49m high, lie about 0.3 and 0.5 mile, respectively, WNW of Castle Rock Point.

Gill Point (15˚58'S., 5˚38'W.), the SE extremity of Saint Helena Island bearing less than 051˚, and open E of Long Range Point, leads SE of Speery Ledge.

From Upper Black Rock to West Point, 2.5 miles WNW, the coast consists of several bays which are exposed to the SW.

The Tristan da Cunha Group

6.17 The Tristan da Cunha Group consists of five islands. **Tristan Island** (37˚06'S., 12˚17'W.) is the largest island. Inaccessible Island lies 18 miles SW of Tristan Island; Nightingale Island, Middle Island, and Stoltenhoff Island lie close together, about 16 miles SSW of Tristan Island, and 10 miles SE of Inaccessible Island. The group is of volcanic origin. There was a volcanic eruption on Tristan Island in 1961.

The current generally sets NE, but other sets are common. A velocity of 2 knots may be attained.

At Tristan Island, the rollers may occur at all times during winds or calm. They are always heavier in calms. Although rollers are more frequent during the winter months, the heaviest rollers occur in December, January, and February, three of the finest months, when they sometimes last 3 or 4 days; this also applies to Gough Island and the other islands in the S hemisphere, according to the account of whalers.

Good radar returns have been reported from the Tristan da Cunha Group at a distance of 24 miles. Tristan Island may be detected by radar at about 95 miles, and Nightingale Island and Inaccessible Island at about 80 miles.

The Tristan da Cunha Group—Tristan Island

6.18 Tristan Island (37˚06'S., 12˚17'W.), about 6 miles in diameter, is in the form of a truncated cone, with its sides rising at an angle of about 45˚ to a central peak, 2,060m high. The sides of the island are walls of inaccessible cliffs, 300 to 610m high, rising directly from the sea, except on the NW side. On the latter side there is, in front of the cliffs, a comparatively low and grassy slope, 30 to 60m high, which terminates in Herald Point, the NW extremity of the island. The sides of the mountain mass as far as the central dome are covered with brushwood, intermixed with ferns and long grass. At elevations above 1,500m, which coincides with the normal upper level of the clouds, the mountain consists of loose stones and volcanic rubble, with occasional rocks and boulders.

Winds—Weather.—Wind from a NW direction has been observed to eddy around the island and to increase in strength as it does so, backing to NW again about 2 miles SE of the island. According to the islanders, this is a common phenomenon.

Thunderstorms are rare, but violent storms occur three or four times a year. Between June and October, the upper part of The Peak is often snow-covered, and sleet, snow, and hail are occasionally experienced at sea level. Mariners are advised to consult the islanders concerning the weather, as they are reported to be able to predict changes within a very short time of their taking place when normal signs give no indication of their approach.

Depths—Limitations.—The island is practically surrounded by a belt of kelp. It was reported (1970) that, at least as far seaward as depths of 36m, the kelp was dense enough to cause blockage of seawater inlets.

The island is steep-to at a distance of more than 1 mile from the coast. Rocks and shoals generally border the points on the S part of the island. Shoals lie about 0.7 mile and 1.5 miles ENE of **Stonyhill Point** (37˚09'S., 12˚16'W.), in the S part of the island.

6.19 Edinburgh (37˚03'S., 12˚18'W.) (World Port Index No. 46710), the only permanent settlement of the Tristan da Cunha Group, stands on the grassy slope which terminates in Herald Point, the NW extremity of Tristan Island. The Ridge, a point terminating in a yellow cliff, lies 1 mile E of Herald Point. During the volcanic eruption on Tristan Island in 1961, lava flowed into what was formerly Falmouth Bay and Quest Bay, between Herald Point and The Ridge. By 1962, the lava field had extended up to 0.3 mile seaward beyond the original coastline on a front of about 0.5 mile between positions about 0.1 and 0.8 mile W of The Ridge. The E part of the lava rose to an elevation of 5m and the W to about 0.3m.

Depths—Limitations.—The anchorage was surveyed in 1972. Mariners are cautioned that following the volcanic eruption at Tristan da Cunha in 1961, there is a possibility that isolated pinnacles, undetected by the above survey, may be encountered offshore.

A rock, with a depth of 3m, was reported (1982) to lie 0.4 mile N of the flagstaff.

Depths of less than 5m extend up to 0.3 mile off Herald Point. A depth of 3m lies 0.4 mile ENE of the point.

Aspect.—Herald Point is 18m high and steep-to. The Hardies, two rocks, the higher of which is 37m high, lie about 2 miles SW of Herald Point. A mast, 10m high, stands 300m E of Herald Point. A conspicuous wind generator is situated on Herald Point.

Prince Philip Hall, near which there is a flagstaff, is the social center, and is situated 0.3 mile SE of Herald Point.

Range beacons, fitted with triangular topmarks, are situated on the grassy slope, about 0.1 mile E, and 0.2 mile S, respectively of Herald Point. Two beacons, in range bearing 114˚, are shown about 1.2 miles E of Herald Point. These beacons only become visible from a distance of about 1.5 miles.

Anchorage.—In 1993, a vessel anchored almost 0.7 mile NNE of Herald Point, in a depth of 34m. This anchorage was reported to be adequate and provided a lee from the SW swell.

Due to the uncertainty of the weather, main engines should be kept ready and the anchor chain considered expendable. There is a small boat harbor, protected by moles, about 0.2 mile E of Herald Point.

There are depths of up to 2.4m at HW within the harbor, but its use is hazardous due to reefs inside the harbor and in its approach, and by breakers which are continuous in the entrance during any form of swell.

Local knowledge is necessary if attempting to enter the harbor by boat, and is at all times difficult.

There is a helicopter landing area about 0.3 mile E of Herald Point. Helicopter operations are possible most days, and are the best way of landing. The landing area is indicated by a circle of white stones and a small “H.” The ground slopes away slightly towards the shore.

Caution.—A local magnetic anomaly causing compass variation of up to 14˚ W was reported (1968) within 3 miles of the coast in the vicinity of Edinburgh.

The Tristan da Cunha Group—Inaccessible Island

6.20 Inaccessible Island (37˚17'S., 12˚40'W.) is a high mass of rock with a table-topped summit. Its highest peak lies on the W side of the island, and rises to an elevation of 560m, and is reported to be a crater with water in it. The irregular slopes of the summit terminate on all sides in precipitous cliffs about 335m high. The NW coast of the island is low with the cliffs receding sufficiently to allow the summit to be reached without difficulty. Kelp-covered reefs extend seaward on either side of the landing place.

The NE coast of the island, also low, has two waterfalls, the E of which is larger and more conspicuous. Kelp was reported

on the NE side of the island in depths of 22m at distances of up to 0.5 mile offshore.

A rock, 0.6m high, lies 0.1 mile offshore, about 0.8 mile ESE of North Point, the N extremity of the island.

Carlisle Bay, a marked indentation on the NE end of the island, has a beach, a waterfall, and the remains of a hut at its head.

Anchorage can be taken, in 35m, with the waterfall at the head of the bay bearing 197˚, distant 0.8 mile, but caution should be exercised, as the survey of the island is incomplete.

Good landing may be made on the beach near the hut at the head of Carlisle Bay. From here a path leads to the top of the cliff. Another landing place is about 0.2 mile farther W. Landing is not allowed without a permit.

A rock, 1m high, lies 0.1 mile offshore, close S of East Point, the E extremity of the island.

South Hill, on the S point of the island, is a remarkable conical rocky hill, 348m high, and located in front of the cliffs. A similar conical hill rises to an elevation of 210m about 0.6 mile NW of South Hill.

A detached rock, 70m high, lies close to the shore, 0.5 mile NE of South Hill.

Pyramid Rock, 18m high, lies about 275m SW of South Hill, with a rock, awash, 0.5 mile W of it, and a rock, 1m high, close S of it. Two other rocks, awash, lie off the SW side of the island, the W and outer of which lies 0.5 mile offshore, and 0.7 mile SW of West Point.

Inaccessible Island was declared a nature reserve in 1994. Landing is prohibited without a permit from the Administrator of Tristan da Cunha. Permits are normally only granted for scientific visits.

The Tristan da Cunha Group—Nightingale Island, Middle Island, and Stoltenhoff Island

6.21 Nightingale Island (37˚24'S., 12˚28'W.), about 1 mile in diameter, has two peaks. The E peak, 337m high, is rugged and precipitous. It appears conical when seen from NE or SW. The other peak, 293m high, has gentle slopes on all but its S side. The coasts of the island, with the exception of the NE side, are precipitous and cut into deep recesses and caves.

Stoltenhoff Island, 0.8 mile N of Nightingale Island, is a precipitous flat-topped rock, 99m high. It consists of one large and two smaller sections, separated by narrow chasms which can only be distinguished from a particular bearing.

Middle Island, 46m high, lies between Nightingale Island and Stoltenhoff Island. Pin Rock, 9m high, lies off its NW extremity.

There are apparently no known off-lying dangers in this island group. A few submerged rocks border the S coast of Nightingale Island, but their positions show up well. Several above-water rocks lie about 0.2 mile S of the SE end of Nightingale Island. Kelp extends 0.3 mile offshore from the E side of the islands. There is less kelp on the S and W sides, which are the most exposed.

The passage between Stoltenhoff Island and Pin Rock is about 0.2 mile wide and appears deep.

The passage between Middle Island and Nightingale Island is about 275m wide, but completely blocked with detached rocks.

Nightingale Island is visited by the settlers of Tristan Island several times a year for birds, eggs, and guano. Walking on the island is difficult during the breeding season of the penguins and Great Shearwaters, except along the old sealers roads and on the plateaus and ridges. Their nests and burrows occupy almost the entire ground, and tussock grass, 2 to 3m high, overruns the island.

The water on Nightingale Island tends to be tainted, possibly due to the number of birds. Drinkable water can be obtained in four large and several small ponds or bogs on the plateau below the lower peak, and also in a small bay about 0.3 mile W of the sealers' road leading from the NE landing place.

Landing may most easily be effected on the rocks at the NE extremity of Nightingale Island. Caution should be exercised, as there is a small rock awash about 50m from the point. There are some huts near the NE landing, and a path leads to the three ponds on the plateau. The old landing place on the SE side of the island is seldom used.

Gough Island

6.22 Gough Island (40˚19'S., 9˚56'W.), 230 miles SSE of Tristan Island, is 7 miles long, well-wooded, and watered. Cliffs rise steeply behind narrow boulder beaches around most of the island. The cliffs at North East Point are 365m high and sheer. Those between Reef Point, 2 miles SSE of North East Point, and Haulround Point, about 2.2 miles farther SSE, are also sheer, but not very high. In most other parts of the island, vegetation, chiefly tussock grass, grows on the steep cliffs up which routes can often be found.

On the W side of the island, the steep cliffs attain a height of 460m in places. At the S end of the island, the land is comparatively low. The interior of the island is an undulating boggy plateau with an elevation of 600m or more, from which the summits rise in easy slopes.

The highest summits are Edinburgh Peak, 910m high, Expedition Peak, Mount Rowett, and South Peak. The sea area in the vicinity of Gough Island has not been fully surveyed, but it is reported that the island may be approached in safety to a distance of about 1 mile, except off West Point and North East Point, where reefs extend up to about 0.8 mile W and 0.2 mile N, respectively. The reef off West Point breaks heavily.

The island is apparently steep-to on all but its E side, where depths of 37m are found up to 0.5 mile offshore. Several islets or large rocks lie off the island, but with the exception of Penguin Islet, they all lie close inshore. In most places, the cliffs of Gough Island rise steeply from the sea and numerous waterfalls descend in long cascades.

Gough Island and the waters surrounding it out to a distance of 3 miles are a declared nature reserve. Landing is prohibited without a permit from the Administrator of Tristan da Cunha. Permits are normally only granted for scientific visits. Exigency visits must be reported as soon as practicable to the administrator and must last no longer than is absolutely necessary according to the safety and health requirements of the visit.

All visiting vessels must be in possession of deratting certification and may be required by the administrator to call at Tristan da Cunha to clear customs, immigration, and health controls before proceeding to Gough Island.

The island is uninhabited (1995) apart from the manning of the meteorological station.

Winds—Weather.—Scientific expeditions have found that, in the summer, E-moving depressions passed mainly to the S of the island, but as winter approached, their tracks moved N; by mid-April, the depressions were passing to the N of Gough Island, causing many more E winds with consequent deterioration of landing conditions at The Glen Beach. Rainfall was heavy, and strong winds and gales were frequent. The Glen had a marked funneling effect on the wind and outside the base hut, the wind had only two directions, down The Glen and up The Glen, which was very gusty.

Tides—Currents.—Currents are strong at times, but erratic, being mostly wind generated.

6.23 Penguin Islet (40˚18'S., 9˚54'W.), 117m high, with an above-water rock close SE, lies 0.5 mile ENE of Reef Point.

Channel Rock, 7m high, lies between Penguin Islet and Reef Point. Passage between the rock and islet is not advisable, except by boat.

Milford Bay lies between Reef Point and Dell Rocks, 4.6m high and close offshore, 1 mile SSE. Buttress Rock, 79m high, lies almost 0.3 mile NW of the outermost Dell Rocks.

Quest Bay lies in the N part of the bight between Dell Rocks and Waterfall Point, 0.6 mile SE. Archway Rock, 21m high, 275m SW of Dell Rocks, lies on the S side of the mouth of The Glen. The Glen, at the N end of Quest Bay, gives access to the interior of the island. The Glen Beach consists of small boulders and shingle, and is approached from SE to clear a submerged rock in the center of the cove.

Luff Point lies 0.3 mile SSE of **Haulround Point** (40˚20'S., 9˚52'W.). Number One, an islet, 73m high, lies close N of Luff Point.

The Admiral, an islet, 52m high, lies between Luff Point and South East Point, 0.4 mile S. The Commodore, an islet, 56m high, lies 0.1 mile NNW of The Admiral. There are a number of other islets and rocks off this stretch of coast.

Transvaal Bay, a small bay with a stream at its head, lies between South East Point and Cavern Head, 1 mile SSW. A meteorological and scientific station, manned by South African scientists, is situated about 0.1 mile inshore on the N side of the bay. It consists of several white buildings, prominent from E, and is well-lit at night. The station is in radio contact with South Africa and can be contacted on VHF channel 16, call sign “Gough Island.”

South West Islet, 104m high, with an above-water rock about 0.1 mile SE of it, lies 1 mile W of **South Point** (40˚22'S., 9˚53'W.). South West Point, with Snug Harbor E of it, lies 0.3 mile NNW of South West Islet.

Saddle Islet, 119m high, lies 0.8 mile NNW of South West Point. Sea Elephant Bay lies between **Gaggins Point** (40˚20'S., 9˚57'W.) and West Point, 3 miles WNW.

North Point lies 2.5 miles NNE of West Point; several rocks lie off this part of the coast. A number of islets lie between North Point and North East Point, 3 miles farther E. The coast continues 2 miles SW to Penguin Islet.

Anchorage.—There are no sheltered bays, but there are a number of open roadstead anchorages. Those off the E side of the island provide the best shelter from the prevailing W and SW winds. Kelp grows around much of the island.

Good anchorage may be found, in 22m, sand and stones, off the head of Hawkins Bay, and in 18 to 27m, in Milford Bay off Capsize Sands, the beach extending about 0.4 mile NNW of Buttress Rock.

Anchorage in Quest Bay, in a depth of 27m, about 0.4 mile E of Archway Rock, is normally used with winds between W and S. This is known as The Glen Anchorage. The bottom consists of black volcanic sand and shell, good holding ground. Landing on The Glen Beach is made difficult, and even dangerous, by the surf. At the foot of Archway Rock, there is a place where experienced boatmen can effect a landing in almost any weather. At the corner of the rock nearest the N end of the beach, there is a chimney up which an active man carrying a coil of rope could climb, and on top of the rock, there are a few island trees to which the line would be secured. In this way, landing on, or departure from, the island can be effected in any but the worst weather.

Anchorage can be obtained in Transvaal Bay, in 37m, with a NW wind. Landing can be made on the NE side of an archway rock, at the entrance to a cove on the N side of the bay. Stores may be hoisted by a crane on the cliff, which can safely handle loads up to 0.2 ton. A boat can secure to an anchor in the rocks.

Anchorage off the W side of the island is not recommended, as it is the weather side and steep-to. The prevailing SW swell renders anchorage on the W side of the island uncomfortable.

Snug Harbor provides slight protection from N winds, in a depth of 27m.

Temporary anchorage in the N part of the island may be found, in 27m, stone, in the W part of Lot’s Wife Cove. The cove lies 1 mile W of North East Point.

Cone Islet and Lot’s Wife lie about 0.5 mile WNW and NW, respectively, of Lot’s Wife Cove.

Landing can be made in calm weather in a number of places around the island, including Lot’s Wife Cove and S of Church Rock, close off North East Point, where there is an islet within which landing is safe, as the place is protected from the swell and N winds by North East Point. The best position for landing will obviously depend upon the wind and swell prevailing at the time. From most beaches, access to the interior of the island is very difficult owing to the cliffy coastline.

Off-lying Seamounts

6.24 An unnamed seamount, with a depth of 185m, has been reported 160 miles WNW of Gough Island. Another unnamed seamount, with a depth of 269m, lies 120 miles NW of Gough Island.

Crawford Seamount (38˚50'S., 10˚30'W.), with a depth of 463m, lies 95 miles NNW of Gough Island.

McNish Seamount (40˚10'S., 8˚30'W.), with a depth of 143m, lies 70 miles ENE of Gough Island. A depth of 90m lies 20 miles W of McNish Seamount.

R.S.A. Seamount (39˚35'S., 6˚40'W.), with a depth of 176m, lies 160 miles ENE of Gough Island.

Zenker Seamount (41˚00'S., 5˚50'W.), with a depth of 1,094m, lies 180 miles ESE of Gough Island.

Discovery Seamount (42˚05'S., 0˚15'E.) has a least known depth of 375m. Shannon Seamount (43˚00'S., 2˚20'E.), with a depth of 586m, lies 120 miles farther SE.

Unnamed seamounts, with depths of 326m and 660m, lie 86 and 140 miles, respectively, WSW of Discovery Seamount. Another unnamed seamount, with a depth of 316m, lies 110 miles SW of Discovery Seamount, and a seamount, with a depth of 633m, lies 70 miles W of it.

Zapiola Seamount (38˚10'S., 26˚00'W.) has a depth of 1,926m.

Valdivia Bank (26˚02'S., 5˚30'E.) has a least known depth of 23m, near the main shipping route NW of the Cape of Good Hope.

In 1985, a local deflection of the compass of 6˚E was reported near the SE edge of Valdivia Bank. Anomalies have also been reported in position 25˚10'S, 9˚50'E and in position 28˚03'S, 12˚16'E.

A depth of 115m was reported (1966) to lie in position 26˚08'S, 6˚30'E.

Ewing Seamount, with a depth of 791m, lies about 220 miles NE of Valdivia Bank.

Vema Seamount (31˚40'S., 8˚22'E.) has a depth of 11m and constitutes a danger to deep-draft vessels. It lies 465 miles WSW of the mouth of the Orange River. There is some evidence that the top of the seamount consists of a plateau about 5 miles in diameter, with depths of 45 to 90m, with some shallower peaks. An unconfirmed depth of 11m is reported to lie on the S side of the plateau.

Tripp Seamount (29˚37'S., 14˚15'E.), with a depth of 150m, lies 125 miles WSW of the mouth of the Orange River. A similar depth was reported (1985) to lie 5 miles SE of the 150m depth.

Wust Seamount (33˚50'S., 3˚35'W.) has a depth of 775m.

Bouvetoya

6.25 Bouvetoya (54˚26'S., 3˚25'E.), formerly known as Bouvet Island, is a territory of Norway and consists of a single volcanic cone with a wide indented crater. Olav Peak attains an elevation of 780m at the center of the island. Bouvetoya lies about 1,360 miles SW of the Cape of Good Hope and 997 miles SE of Gough Island. Bouvetoya is the most isolated piece of land on the earth's surface. The island is uninhabited.

Winds—Weather.—Bouvetoya lies in the path of the strongest W winds. Thick clouds usually obscure the covering ice cap from view. Snowfalls are frequent. Temperatures rarely exceed 2˚C in summer and average about 1.5˚C in winter.

Ice.—The mean position of the sea ice limit at the time of greatest extent (September to October) probably lies close S of Bouvetoya. It is therefore only in worse than average years that the island is likely to be engulfed by sea ice and even then, only during the period from about August to November.

Tides—Current.—A slight E current has been observed in the vicinity of Bouvetoya.

Aspect.—The slopes of the central cone terminate on all sides in precipitous cliffs or glaciers, descending abruptly to sea level. The two largest of these glaciers are Posadowsky Glacier, located W of **Cape Valdivia** (54˚24'S., 3˚24'E.), the N extremity of the island, and Christensen Glacier, about 1 mile E of Cato Point, the SW point of the island.

The E side of the island is entirely covered with an ice sheet which extends up the crater slopes to an elevation of about 425m and reaches the sea as an ice-wall about 122m high.

The N and W sides of the island are comparatively free from ice, except for isolated glaciers, and are much steeper than the S and E sides of the island.

6.26 Cape Circoncision (54˚25'S., 3˚21'E.), the NW extremity of the island, is easily recognized by its dark color, which stands out prominently against the glaciers descending to the sea on either side of it.

Norvegia Point, 2 miles S of Cape Circoncision, is surmounted by a conspicuous knoll.

Mosby Peak, 671m high, and Lykke Peak, 767m high, lie 0.8 mile NE, and 1 mile E, respectively, of Norvegia Point.

A rock, 1.2m high, lies 0.4 mile W of Cape Circoncision, and rocks, partly submerged, extend about 0.3 mile NE of the cape. Norris Reef lies 0.5 mile SW of the same cape. A rock, 46m high, existence doubtful, was reported (1929) in position 56˚07'S, 23˚39'E, about 720 miles E of Bouvetoya, and 1,277 miles S of Cape Agulhas. A seamount, with a depth of 207m, lies 170 miles farther NNE. Benn Skerries and two detached rocks, one submerged and one above-water, lie within 0.5 mile W and SSW, respectively, of Norvegia Point.

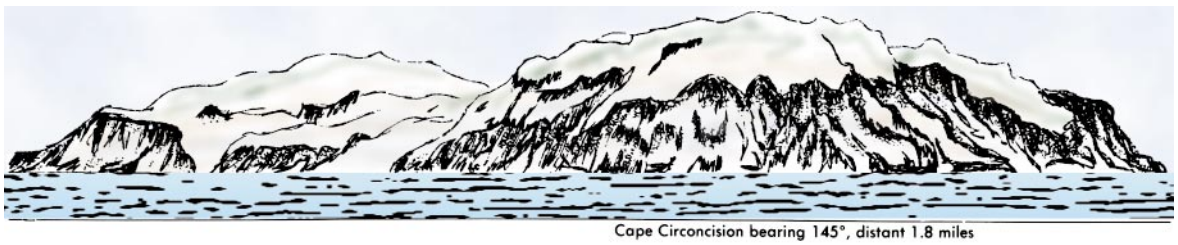
Larsoya (Lars Islet), 21m high, lies close off Cato Point. Submerged rocks extend about 0.3 mile SW from Larsoya.

A pinnacle rock, with a depth of 7.3m, was reported (1964) to lie about 0.8 mile S of Cato Point.

Williams Reef lies close SSW of Cape Fie, the SE point of the island. Lindsay Reef lies close N of Cape Meteor, the E point of the island.

Spiess Rocks extend up to 0.3 mile NE of Cape Lollo, which lies 0.8 mile N of Cape Meteor.

Norvegia Rock, with a depth of less than 1.8m, position doubtful, is charted 0.5 mile ENE of Cape Valdivia.



Bouvetoya from NW

Lille Kari, 1.8m high, lies 0.3 mile offshore, 2 miles ESE of Cape Valdivia. Store Kari, 3m high, lies 0.8 mile E of the same cape.

Anchorage.—Temporary anchorage can be taken, in a depth of 40m, about 0.4 mile off Christensen Glacier.

Anchorage can also be taken, in a depth of 27m, about 0.6 mile ENE of Cape Meteor.

Vessels may anchor, in a depth of 40m, about 0.4 mile ENE of Store Kari and 0.4 mile N of the landing place close W of Posadowsky Glacier.

Landings, at all times difficult, have been made at the following places:

1. In a small cove close W of Posadowsky Glacier.
2. On a beach 0.2 mile S of Norris Reef.
3. Near Norvegia Point.
4. On Larsoya.
5. Near Cato Point.

Caution.—It has been reported (1994) that Bouvetoya lies about 2 miles W and 0.8 mile N of its charted position.

Dangers not shown on the chart may exist. The rocks offlying the coast are generally covered with ice and may therefore be mistaken for icebergs.

The **Meteor Seamounts** (48˚30'S., 9˚00'E.), with a least depth of 532m, lie 475 miles NE of Bouvetoya.

Spiess Seamount (54˚25'S., 0˚15'E.), with a least depth of 285m, lies 120 miles W of Bouvetoya. A seamount, with a depth of 207m, lies 170 miles farther NNE. “aa”

Afrikaans

AFRIKAANS	English
A	
aanleplek	wharf
B	
baai	bay
baaitjie	cove
baggerbank	spoil ground
baken	beacon
bank	bank
berg	mountain
berge	mountain, mountain chain
blinder	submerged rock
blou	blue
boei	buoy
boot	boat
branding	surf
branders	breakers
breekwater	breakwater
buffel	buffalo
D	
deurvaart	passage
diepte	depth
dok	dock
dooiety	neap tide
dorp	village
droog	dry
drywend	afloat
duiker	cormorant
duin	dune
E	
eb	ebb
eiland	island
eilandjie	islet
eskarp	escarpment
F	
fontein	spring
G	
geel	yellow
gestrand	aground
gety	tide
gevaar	danger
golf	wave
groen	green
H	
hawe	harbor, port
hawehoof	mole
hawekom	basin
heuwel	hill
hindernis	obstruction
hoek	corner
hoog	high
hoogte	height, elevation
hout	wood
J	
jakkals	jackal
K	
kaai	jetty, quay, wharf
kaap	cape, headland
kabellengte	cable
klip	stone
kloof	gorge
knoop	knot
koers	course
kompas	compass
kop	hill
koppie	hillock
krans	cliff
kus	coast, shore
L	
laag	low
land	land
landteken	landmark
leeu	lion
leimerk	leading mark
M	
magneties	magnetic
malgas	gannet
mast	mast
meer	lake
meerplek	mooring

AFRIKAANS	English
merk	mark
mis	fog
modder	mud
moeras	swamp
mossel	mussel
N	
nek	pass
newel	mist
noord	north
O	
olifant	elephant
ondersee berg	seamount
onderwater	submerged
oorspoel	awash
oos	east
op land	ashore
P	
peiling	bearing
piek	peak
pier	pier
pikkewyn	penguin
pelikaan	pelican
punt	point
R	
radiobaken	radio beacon
reen	rain
rivier	river
riviermonding	estuary
rob	seal
rollers	rollers
rooi	red
rots	boulder, rock
S	
sand	sand
sandbank	bar
see	sea
seegras	kelp
seekaart	chart
seemeer	lagoon
seemyl	mile
seewarts	offshore
skeep	ship
skeepswerf	dockyard
skiereiland	peninsula
snelheid	speed
springty	spring tide
stad	city, town
stilwater	slack water
stormwind	gale
strand	beach, shore
stroom	current
suid	south
swart	black
T	
tafel	table
teken	mark
toring	tower
V	
vaam	fathom
vaarwater	fairway
vallei	valley
vls	fish
vlakwater	shoal
vlei	marsh
vloed	flood
vloedbos	mangrove
voorgebergte	bluff
voorstrand	foreshore
vuurtoring	lighthouse
W	
wal	embankment
walvis	whale
werweling	eddy
wes	west
wit	white
wolk	cloud
wrak	wreck
Y	
yster	iron

Dutch

DUTCH	English
A	
aan	at, near, on
B	
baak	beacon
berg	mountain, hill
binnen	inner
blauwe	blue
bocht	bay, bend, light
bol	ball
boom	tree
bosch	forest
boschje	small wood, brush
breed	broad
brug	bridge
buiten	outer
bult	hump
D	
dam	dam, breakwater
de, den	the
diep	deep
dijk	dike
dorp	village
draaikalk	eddy
drempel	bar
dric	three
drichoek	triangle
droogte	shoal
duin	dune, sandhill
dwars	across, athwart
E	
eiland	island
F	
friesche	frisian
G	
gat	channel
geul	narrow channel
groei	green
gronden	grounds
groot	great

DUTCH	English
H	
haven	harbor
helft	half
het	the
heuvel	hill
hoek	cape, point
hoofd	head
hoog	high
hout	wood, timber
K	
kaap	cape, headland
kake	quay
kegel	cone
kil	channel
klein	small
klip	rock
kop	head
kreek	creek
kromme	crooked
kust	coast
L	
laag, lage	low
lang	long
licht	light
loods	pilot
loodswezen	pilotage
M	
meer	inland sea
middel, midden	middle
modder	mud
molen	mill
N	
nauw	narrows
nieuw	new
noord	north
noorder	northern
O	
oost	east
oud	old

DUTCH	English
P	
peilschaal	tide gage
plaat	shoal
plaatje	small shoal
plat	flat
polder	reclaimed land
punt	point
R	
rak	channel
rechthoekig	rectangular
reddingboot	lifeboat
rede	roadstead
rode, rood	red
rots	rocks
rug	ridge
ruitvormig	diamond-shaped
S	
schaar	channel
scherm	screen
schor	shoal
schutsluis	lock gate
seinen	signals
sluis	lock
smal	narrow
spits, spitse	pointed
spoorweg	railway
staart	tail (of a bank)
stad	town
steen	stone
steiger	jetty, pier
steile	steep
strand	beach, shore
stroom	current, stream
T	
toegang	access
tramweg	tramway
U	
uit	out
V	
vaart	canal
vaarwater	fairway
valsch	false
van	of
veerboot	ferry
verklikker	warning light
vlckte	flat below surface
vliegtuigen	aircraft
W	
wad	drying coastal bank
wal	banks, wall
watergetijden	tidal current
waterweg	waterway
weg	way
werk	work
wester	western
wit, witte	white
wrak	wreck
Z	
zand	sand
zee	sea
zeegat	estuary
zuid	south
zuider	southern
zwart	black

French

FRENCH English

A

anse ..... bay, creek
archipel ..... archipelago
arriere port ..... inner port
avant port ..... outer port

B

baie ..... bay, gulf
balise ..... beacon
banc ..... bank, sandbank
barre ..... bar
basse ..... shoal
bassin ..... basin
blanc ..... white
bois ..... wood
bouche ..... mouth (of river)

C

canal ..... channel, canal
cap ..... cape, headland
chaloupe ..... launch
chalutier ..... trawler
chateau ..... castle
chaussee ..... bank
chenal ..... channel
clocher ..... steeple
colline ..... hill
couvent ..... convent
crique ..... creek

D

digue ..... mole, breakwater

E

ecluse ..... lock of a canal or basin
eglise ..... church
est ..... east
etang ..... lake

F

falaise ..... cliff
faux ..... false
fleuve ..... river
fosse ..... ditch, a deep

FRENCH English

G

golfe ..... gulf
goulet ..... narrow entrance
grand(e) ..... great

I

ile ..... island
ilot ..... islet

J

jetee ..... jetty

L

lac ..... lake
lagune ..... lagoon

M

maison ..... house
menhir ..... a large raised stone
milieu ..... middle
mole ..... pier
mont ..... mountain
mouillage ..... anchorage
moulin ..... mill

N

noir ..... black
nord ..... north

O

occidentale ..... western
orientale ..... eastern
ouest ..... west

P

passe ..... channel
pertuis ..... opening or strait
petit ..... small
pic ..... peak
plerre ..... stone
piton ..... mountain peak
plateau ..... tableland or flat
pointe ..... point

FRENCH	English
pont	bridge
port	port, harbor
presquiile	peninsula

Q

quai	quay, wharf

R

rade	roadstead
recif	reef
reviere	river
roche or rocher	rock
rouge	red

FRENCH	English

S

sable	sand
sommet	summit
sud	south

T

tour	tower

V

vert	green
ville	town

Portuguese

PORTUGUESE English

A

a, as ..... the (fem.)
aldeia ..... hamlet
alto, s ..... height, heights
altura, s ..... height, heights
amarclo ..... yellow
ancordouro ..... anchorage
angra ..... inlet, bight, cove
aquario ..... aquarium
areia ..... sand
arquipelago ..... archipelago
atalaia ..... lookout
azul ..... blue

B

bacia ..... basin
baia ..... bay
baixio ..... shallow, shoal
baixio, a ..... shallow, shoal
baliza ..... beacon
banco ..... bank
barra ..... bar
barrio ..... district (of a town), ward
basilica ..... basilica
bateria ..... mouth, entrance
branco, a ..... white

C

cabeco, a ..... summit of a hill or shoal
cabo ..... cape
cais ..... quay, wharf
cala ..... creek, channel, narrow inlet
calheta ..... inlet
canal ..... channel
capela ..... chapel
carreira ..... narrow channel, slipway
casa ..... house
casal ..... farmhouse
castelo ..... castle
catedral ..... cathedral
cemiterio ..... cemetery
chale ..... chalet
cidade ..... city, large town
cidadela ..... citadel
cinzento ..... grey
colina ..... hill, hillock
colonia ..... colony, settlement
concha ..... cove

PORTUGUESE English

comento ..... convent
coroa ..... sandy head
cruz ..... cross

D

de dentro (adj.) ..... inner
desembarcadouro ..... landing
doca ..... dock
duna ..... dune

E

enseada ..... bay, bight, cove
entrada ..... fairway
ermida ..... hermitage
espigao ..... projecting point
esporao ..... groyne
estacada ..... pier, projecting wharf, mole
estaleiro ..... shipyard
este, leste ..... east, eastern
esteiro ..... creek
estreito ..... strait, narrows
estuario ..... estuary

F

fabrica ..... factory
farillhao ..... stack, steep-sided rocky islet
fora ..... outer
fortaleza ..... fortress
forte ..... fort
foz ..... mouth of a river
fundeadouro ..... anchorage

G

grande ..... large
golfo ..... gulf

I

greja ..... church
ilha ..... island
ilheu, ilhota ..... islet
istmo ..... isthmus

L

lago ..... lake, lock
lagoa ..... small lake, marsh
laguna ..... lagoon
laje ..... flat-topped rock
lugar ..... hamlet, place

PORTUGUESE	English
M	
mar	sea
mata	forest, wood, thicket
meridional	southern
moinho	mill
molhe	mole, pier
montanha	mountain
monte	mount
morro	hill, knoll
N	
note	north
O	
o, os	the (masc.)
occidental	western
oeste	west
oriental	eastern
P	
palheiros	fishing village
paredao	sea wall
pedra, s	rock, stones
pena	rocky, peak
penedo	rocky, peak
peninsula	peninsula
pequeno	small
pico	peak
pinhal	pine wood
ponta	point (of land)
pontal	point, promontory
ponte	bridge, pier
ponte-cais	pier, jetty
portinho	small port or harbor
porto	port, harbor
povoa	large town
povoacao	village
povoado	village
praia	beach
preto, a	black
promontorio	promontory
Q	
quebra-mar	breakwater
quebrada	cut, gap, precipice
R	
rampa	ramp, boat-slip
restinga	spit, reef
ria	estuary, lagoon, sunken valley
ribeiro	brook
rio	river
rocha	rock
rochedo	rocky place
rocher	rock, rocky place
S	
s. santo, a, sao	saint
sanatorio	sanatorium
sepentrional	northern
serra	mountain range
serro	rocky reef or ridge
sul	south
T	
terra	land
torre	tower
V	
vale	valley
varadouro	landing
verde	green
vermelho, a	red
vigia	lookout
vila	town, village, villa

Spanish

SPANISH — English

A

abra — cove, creek, haven, opening
acantilados — cliffs
adentro — (adj.) inner, inside
afuera — (adj.) outer, outside
aguada — watering place
agudo, da — (adj.) sharp, pointed
aguja — needle
albufera — lagoon, pond
aldea — village
alto, a — (adj.) tall, high
altos — heights
alturas — heights
amarillo, a — yellow
ancho — (adj.) wide, broad
ancladero — anchorage
anclaje — anchorage
ancon — open bay or roadstead
angostura — narrows
archipielago — archipelago
arena — sand
arenal — extensive area of sand
arrecife — reef
arroyito — brook
arroyo — steam, rivulet
astillero — shipyard
atalaya — watchtower, high viewpoint
azul — blue

B

bahia — bay
bajio — shoal
bajo — (n) shoal (adv.) below, under (adj.) low
baliza — beacon
balneario — seaside resort
bancha — bank
banco (de arena) — bank (sandbank)
barlovento — windward
barra — bar (of a river, etc.)
barranco — precipice, ravine
barrera — barrier (e.g. mountain barrier)
barrio — ward, section (of a town)
bateria — battery
blanco, a — (adj.) white (n) target
boca — mouth
bodega — storehouse
boqueron — wide mouth, opening or entrance
boquete — narrow entrance, gap
bravo, a — coast, shore, beach exposed to heavy seas
brazo — arm (of the sea, etc.)

SPANISH — English

C

cabeza — shoal head
cabezo — shoal head, summit of a hill
cabo — cape
cadena — chain (of mountains, etc.)
cala — narrow cove or creek with steep sides
caleta — cove
caleton — large cove
campo — any tract of country
canada — glen
canal — channel
canalizo — narrow channel
cano — creek
canto — bluff
capilla — chapel
cargardero — shore or ship loading appliance
carrera, carreiro — narrow channel or passage
casa — house
cascada — waterfall
caserio — hamlet, group of houses
castillo — castle
castro — headland, hillock surmounted by ruins
cayo — cay
cerrito — hillock
cerro — hill, hillock
chico, a — small
chubasco — squall
cima — summit, crest
ciudad — city, town
ciudadela — citadel
co — rocky shoal, rock
colina — hill, hillock
collado — hillock, elevation
colonia — colony, settlement
colorado — reddish in color
comarca — region
concha — bay or cove
cono — cone
convento — convent
cordillera — mountain range
corona — crown, summit
cortadura — cut, cutting, very narrow channel or defile
costa — coast
coto — summit
cruz — cross
cuartel — barracks
cuesta — sloping ground, hill, hillock
cueva — cave
cumbre — summit, peak
cuna — quoin, wedge
cuspide — summit

SPANISH	English

D

darsena	basin, dock, backwater
delta	delta
departamento	department
desembarcadero	landing place
desembocadura	mouth of a river
desierto	desert
dique	mole, dock, embankment, levee
distrito	district
doble	double
duna	dune

E

el	definite article (masc.)
embocadura	mouth
ensenada	bay
entrada	entrance
ermita	hermitage
escollera	breakwater, wavetrap
escollo	shallow rock, reef awash
espigon	arm of a mole
estacion	station
estancia	ranch, country estate
este	east
estero	creek, inlet
estrecho	straits, narrows
estuario	estuary
exterior	outer, exterior

F

farallon	stack, steep sharp-pointed rocky islet
faro	lighthouse
fondeadero	anchorage
fortaleza	fortress
fraile	friar
freo	strait
freu	narrow strait between island and mainland
fronton	wall-like cliff
fuerte	fort

G

garganta	narrow restricted passage, sound
garita	sentry box, lookout hut
golfo	gulf
gran, grande	large, great, big
gris	grey
grupo	group (of islands)

H

hacienda	farm, plantation
herradura	horseshoe-shaped bay

SPANISH	English

I

iglesia	church
insua	small islet or rock
interior	inner
isla	island
islete	islet
islita	small island, islet
islote	barren islet, skerry
islotillo or islotito	small barren islet (dim.)
istmo	isthmus

L

la, las	definite article (fem.)
lago	lake
laguna	lagoon, pond
laja	flat rock
largo, a	long
lastra	rocky ledge
laxe	rock
levante	eastern
loma	hillock, knoll
lomo	ridge
los	definite article (masc.)
lugar	village, place
lugarejo	hamlet
llana	plain
llano, a	plain, flat (adj.)
llanura	plain

M

malecon	quay, mole
mar	sea
margen	shore, river bank
marisma	marsh
medano	dune, sandhill
medio	middle
meridional	southern
mesa or meseta	tableland, plateau
mogote	hummock
molino	mill
monasterio	monastery
montana	mountain
monte	mountain, mount
monte	forest, group or clump of trees
monticulo	knoll
moreno	brown
morro	headland, bluff, head of breakwater
muelle	pier, jetty, mole
muralla	a barrier wall of mountains, cliffs, etc.

N

negro, a	black

SPANISH	English
norte	north
nuevo, a	new

O

obscuro	dark
occidental	western
oeste	west
oriental	eastern
oriente	east
orilla	shore, edge, bank (of a river)
oscuro	dark

P

palacio	palace
pan de azucar	sugar loaf
pantano	swamp, marsh
pardo	grey
parque	park
pasco	promenade, avenue
pasale	passage
paso	pass
pedregal	stony or rocky patch
pena	rock
penasco	a large rock
peninsula	peninsula
penon	rocky mountain
pequeno, a	small
peton	pinnacle rock
picacho	sharp peak
pico	peak
piedra	stone, rock
placer	shoal
playa	beach
poblacion	town
poblado	village
poniente	western
pozo	well, deep hole in river or sea bed
presa	barrage, weir
promontorio	promontory
provincia	province
puebla	village
pueblecito	small town, village
pueblito	hamlet
pueblo	town
puente	bridge
puerto	port, harbor
punta	point
puntal	narrow point

Q

quebrada	ravine, gully

SPANISH	English

R

rada	roadstead
redondo, a	round
regato	torrent, stream
restinga	reef
reventazones	breakers
ria	sunken valley forming estuary
riachuelo	riverlet
ribera	shore, river bank
rincon	inner angle or corner, a small cove
rio	river
roca	rock
rocalloso, a	pebbly, stony
rochel	rocky patch
rodal	shoal, usually rocky and of some extent
rojo, a	red
rompeolas	breakwater
rompientes	breakers
roquerio	rocky shoal

S

salinas	saltpans
san, santo, a	saint
seco	dry
seno	bight, sound
septentrional	northern
serrania	mountain ridge
sierra	mountain range
silla	saddle
sotavento	leeward
sucio, a	foul
sud, sur	south
surgidero	anchorage

T

tenedero	holding ground, anchorage
tetas	nipples
teton	large nipple
tierra	land
torre	tower
touza	rock (usually lying off a larger feature)

V

vado	ford
valle	valley
varadero	slipway
vega	plain (noun)
ventisquero	glacier
verde	green
viejo, a	old
vigia	lookout

SPANISH	English
villa	town, villa
villorio	hamlet
volcan	volcano
vuelta	bend, turn (of a channel)

SPANISH	English
Z	
zona	zone

How to use the Index—Gazetteer

Geographic names of navigational features are generally those used by the nation having sovereignty and are listed alphabetically. Diacritical marks, such as accents, cedillas, and circumflexes, which are related to specific letters in certain foreign languages, are not used in the interest of typographical simplicity.

Geographic names or their spellings do not necessarily reflect recognition of the political status of an area by the United States Government. Positions are approximate and are intended merely as locators to facilitate reference to the charts.

To use as a Gazetteer note the position and Sector number of the feature and refer to the Chart Information diagram for the Sector. Plot the approximate position of the feature on this diagram and note the approximate chart number.

To use as an Index of features described in the text note the paragraph number at the right. To locate this feature on the best scale chart use the Gazetteer procedure above.

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